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17th Professor Alborzi International clinical microbiology Congress (The 17th ICCM)

&

4th International Congress on prevention Strategies for Healthcare- associated infections

Mashhad-Iran

5-7 November 2024

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Clinical Microbiology
Antimicrobial Resistance
Healthcare-associated Infections
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Infection in Immunocompromised Persons
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The 17th Professor Alborzi

International Clinical Microbiology Congress & 4th International Congress on Prevention

Strategies for Healthcare-associated Infections

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Oral Presentations

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Best Practice Procedures of The Most Frequent Invasive Medical Device: The Peripheral Venous Catheter

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Keywords:
Bloodstream infections, Peripheral venous catheters, Prevention of infectious complications

ABSTRACT

Up to 70% of inpatients receive one or more peripheral venous catheters, often immediately upon admission, and without clear indication. Sales are estimated at 1.2 billion catheters globally. Most complications in context with this medical device are mechanical or chemical, mostly (thrombo-) phlebitis. Incidence densities of local infections and bloodstream infections are estimated at 0.6 per 1000 catheter-days and 0.2 per 1000 catheter-days, respectively. Although less incident, absolute numbers of bloodstream infections due to peripheral venous catheters are similar to the use of central venous catheters because of the frequent use of peripheral lines. The World Health Organization has recently published best practice guidelines for the prevention of infectious complications associated with the use of peripheral catheters – Guidelines on central catheters will be issued in 2025. The recommendations are based on an extensive systematic review and use of GRADE-Pro. The review showed evidence for most practice measures to prevent infectious complications, although methodologically, the evidence-base remains limited. This is mainly due to the challenges of testing single interventions in the context of clinical routine and bundled intervention strategies. The WHO-recommendations are grouped into “education and training”, “hand hygiene and aseptic no-touch-technique”, “catheter insertion”, “catheter maintenance”, “catheter access”, and “catheter removal”. They confirm common best practice procedures, and are in line with expert consensus outside the WHO guideline committee.

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Biological Toxins and Bioterrorism – A Big Threat for All

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Keywords:
Biological warfare agents, BWA, Bioterrorism, Toxin, Threat, Weapon

ABSTRACT

Chemical substances produced by living organisms such as bacteria, viruses, fungi, insects, plants that have toxic properties for other organisms, especially humans, are called biological toxins. Intentional use of these organisms and or toxins are known as Biological Warfare Agents (BWA). Based on the risk of pathogenicity, availability, ease of transmission and national security threat, BWA have been prioritized into three categories of A, B and C. Category A: Anthrax, Botulism, Plague, Smallpox, Tularemia and Viral hemorrhagic fevers. Category B: Agents such as Staphylococcal Enterotoxin (Type B), Epsilon toxin of Clostridium perfringens, Ricin Toxin, Abrin toxin, and Trichothecene Mycotoxins. Category C: Hanta viruses, multidrug-resistant tuberculosis, Nipa virus, the tick-borne encephalitis viruses, the tick-borne hemorrhagic fever viruses and yellow fever. Newly emergent pathogens for possible use as a BWA or in a terrorist attack is very difficult to recognized and require investigations by using new technologies. BWA enter the body through respiratory, skin, oral and injection routes. Therefore, they are misused in various forms such as aerosol, lotion, water, food and skin injection and as weapons such as grenades, bombs and rockets. They usually have an incubation period of a few hours to a few days. Laboratory diagnosis of a BWA is time consuming. Unexpected occurrence of unknown illness and mortality in a group of people or even in animals including marines and dryness of plants suggest the use of a BWA. Public education for prevention, prompt clinical diagnosis and treatment of the patients are of vital importance.

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Breast Cancer and VPR Gene Therapy, Effective or Not?

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Keywords:
Breast cancer, HIV, VPR, Gene therapy

ABSTRACT

Introduction: Breast cancer is the second most common cancer among women worldwide. Early detection significantly increases the chances of recovery and survival. One of the most promising developing methods for treating intractable diseases, especially cancers without effective current treatments, is gene therapy. The VPR gene of the HIV virus has attracted scientists' and researchers' attention for cancer treatment due to its lethal and destructive functions in CD4+ T cells, potentially inducing cell death through this viral protein. Among the novel methods for gene transfer and integration in eukaryotic cells is the use of developing viral vectors, including lentiviruses. This research aimed to investigate the cytotoxic effects of a recombinant plasmid containing the VPR gene in a breast cancer cell line.

Materials and Methods: To observe the cytotoxic effects of the recombinant pCDH-VPR plasmid on MCF-7 cells, the following steps were taken: The VPR gene from HIV virus was extracted from the pBluescript II plasmid using BAMH1 and XBA1 restriction enzymes. The lentivirus plasmid was linearized using the aforementioned enzymes. The VPR gene was integrated into the linear lentivirus plasmid using T4 DNA Ligase enzyme, creating a recombinant plasmid. Electrophoresis was used to confirm the accuracy of proteins and plasmids at each stage. The plasmid was transferred into TOP10 bacteria using CaCl2 to increase the required plasmid amount and was isolated using a plasmid extraction kit. Fusofect nanoparticles were used to transfect this plasmid into MCF-7 cells. Apoptosis and necrosis pathways were examined at 24, 48, and 72-hour intervals using flow cytometry. Real-Time PCR was used to examine the expression of genes involved in cell death.

Results: Our results showed that exposing MCF-7 cells to the recombinant pCDH-VPR plasmid can induce apoptosis and necrosis. Consequently, the lentivirus vector containing the VPR gene may play a role in breast cancer treatment, although further studies are needed to reach a definitive treatment.

Conclusion: This study aimed to investigate the relationship between the recombinant pCDH-VPR plasmid and its anti-cancer activity against MCF-7 cells. Although the exact mechanism of the anti-cancer activity of the recombinant pCDH-VPR plasmid against MCF-7 cells is not fully understood.

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In Vitro and In Vivo Toxicity and Antibacterial Efficacy of Melittin against Extensively Drug-Resistant *Acinetobacter baumannii* (XDR-AB) and KPC-Producing *Klebsiella pneumoniae* (KPC-KP)

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Keywords:
Antibiotic resistance; In vivo; In vitro; Melittin; Antimicrobial peptides

ABSTRACT

Introduction: The rise of antibiotic-resistant pathogens has led to increased interest in antimicrobial peptides as potential therapeutic agents. Melittin has shown promise in vitro, but in vivo studies remain limited. This study aimed to bridge the gap between in vitro and in vivo research on these peptides.

Materials and Methods: We evaluated the antimicrobial effects of melittin against extensively drug-resistant *Acinetobacter baumannii* (XDR-AB) and KPC-producing *Klebsiella pneumoniae* (KPC-KP) using both in vitro and in vivo approaches. For the evaluation of antimicrobial efficacy, in vitro assessments encompass Minimum Inhibitory Concentration (MIC), Minimum Bactericidal Concentration (MBC), and Time-Killing Curve (TKC) analyses. In vivo studies in BALB/c mice determined acute and subacute toxicity, including Median Lethal Dose (LD50) and maximum sub-lethal dose, followed by cumulative toxicity evaluation. Additionally, the antimicrobial effects of melittin were assessed in peritonitis models and blood cultures for infections caused by carbapenemase-producing *Klebsiella pneumoniae* (KPC-KP) and extensively drug-resistant *Acinetobacter baumannii*.

Results: In vitro, melittin showed MIC/MBC values of 14/14 µg/mL against XDR-AB and 32/50 µg/mL against KPC-KP. TKC analyses revealed concentration- and time-dependent bactericidal activity for the peptide. In vivo, the LD50 and maximum sub-lethal doses were 4.96/2.4 mg/kg for melittin. Subacute toxicity studies showed no mortality, and histopathological evaluations of liver and kidney tissues revealed no significant abnormalities in treated mice. The treatment of infected mice with sub-lethal doses of antimicrobial peptide was acceptable.

Conclusion: Melittin demonstrated promising antimicrobial efficacy and safety profiles in both in vitro and in vivo settings. These findings support its potential as a candidate for further development as an antimicrobial agent, though additional studies are warranted to fully elucidate its therapeutic potential.

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Parasitic Protozoan Diseases in Iran

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Keywords:
Protozoan diseases, Malaria, Leishmaniasis, Amoebiasis, Isosporiasis, Crptosporidiasis, Cyclosporiasis, Blastocystis infection, Giardiasis

ABSTRACT

If we divide the causative agents of parasitic diseases into three groups: worms, protozoa and arthropods, the diseases caused by protozoa can be more frequent and more pathogenic than the other two groups. Although diseases caused by some worms can also have significant side effects in humans, such as filariasis, strongyloidiasis or hookworm infections. On the other hand, some arthropods such as Demodex and Sarcoptes play important role in causing skin diseases. Besides having poisonous and deadly bites by scorpions and spiders, insects play an important role in transmission of diseases such as filariasis, malaria and leishmaniasis. However, in this topic, we discuss diseases caused by parasitic protozoa in Iran. Human pathogenic protozoa can be placed in two important categories. Protozoa that cause diseases in the gastrointestinal and urogenital tract, and protozoa that cause damages in the blood and other organs of the body. Among many species of amoebae, whose number is significant, only three species cause disease in human. Entamoeba histolytica causing dysentery, abscess inside liver, lungs, brain etc. and the other two amoebae Neglaria spp. and Acanthamoeba spp. causing keratitis and meningoencephalitis. Among the common flagellates of the intestine and genital tract, Giardia and Trichomonas vaginalis are important. Blastocystis can also cause damage and symptoms like Giardiasis. Among ciliates, only Balantidium can cause dysentery and symptoms like Entamoeba histolytica, and only two cases of this disease from Mashhad have been reported by scientific journals. Another group of protozoa that play a role in causing intestinal infections, especially in people with low immunity or immunodeficiency, belong to the sporozoa branch. These protozoa are less known because they cannot be identified by conventional methods, and unfortunately, clinicians and laboratories do not pay attention to them. Although protozoan diseases of blood and tissues such as Leishmaniasis, Malaria and Toxoplasmosis are well known, but they have different clinical forms that may be misdiagnosed by clinicians.

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ARF old Disease and New Challenges

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Keywords:
Rheumatic fever, Children and young adults, Diagnosis

ABSTRACT

Rheumatic fever (RF) is a known complication of type A streptococcus infection mediated by immune system responses. Worldwide, RF is the most common cause of acquired and preventable heart disease in children and young adults. RF can lead to important cardiac and neurologic complications. Although Diagnosis is based on modified jones criteria but clinical suspicious is very important especially in high-risk population. Echocardiography is a sensitive and noninvasive diagnostic tool that in clinical setting can be a rapid test in early diagnosis and treatment at the end of same study. Some interesting and challenging cases reviewed in panel and characters of rheumatic carditis and rheumatic heart disease versus other types of carditis and non-rheumatic valve disease reviewed.

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Comprehensive Strategies for Preventing Dengue Virus Infection: Insights into Mosquito Control, Vaccination, and Community Engagement

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Keywords:
Dengue virus infection, Prevention strategies, Personal protective measures, Aedes aegypti

ABSTRACT

Dengue virus infection poses a significant public health challenge, particularly in tropical and subtropical regions. Effective prevention strategies are crucial for reducing the incidence of the disease. Key methods for preventing dengue virus infection include: 1. Mosquito Control: This involves reducing mosquito populations through various means such as insecticide-treated curtains, which have shown effectiveness in decreasing Aedes aegypti populations for extended periods. Insecticide spraying, particularly during outbreaks, is less effective due to the breeding habits of these mosquitoes indoors. Personal Protective Measures: Individuals are encouraged to use mosquito repellents containing DEET and to wear protective clothing to minimize exposure to mosquito bites, especially during peak activity times. Vaccination: Two vaccines, CYD-TDV (Dengvaxia) and TAK-003 (Qdenga), are currently available and recommended in specific populations, particularly for those with confirmed prior dengue infection. Vaccination strategies aim to achieve tetravalent immunity to protect against all four dengue virus serotypes, although the long-term efficacy and safety profiles require careful monitoring. Community Education and Engagement: Community initiatives aimed at educating the public on eliminating breeding sites, such as stagnant water, are essential for sustainable mosquito control efforts. These combined strategies represent a comprehensive approach to dengue prevention, emphasizing the need for ongoing research and community involvement to adapt and enhance prevention efforts.

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Critical Insights into Fever and Rash Emergencies: Timely Recognition and Management

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Keywords:
Fever and rash,
Emergencies,
Recognition,
Management

ABSTRACT

Fever and rash are significant clinical manifestations that can indicate serious underlying conditions requiring prompt medical intervention. This review discusses selected emergencies associated with fever and rash, highlighting their clinical features, diagnosis, and management. Meningococcal infection, caused by Neisseria meningitidis, presents with fever, myalgia, and a characteristic petechial rash. It can rapidly progress to meningococcemia, leading to high mortality rates if not treated immediately with parenteral antibiotics. Bacterial endocarditis may also manifest with skin lesions such as petechiae and Janeway lesions, necessitating early blood cultures to guide antibiotic therapy. Rocky Mountain spotted fever (RMSF), a tick-borne illness, typically begins with fever and headache, followed by a rash that evolves from maculopapular to petechial. Necrotizing fasciitis is a life-threatening infection that requires urgent surgical intervention, often presenting with rapidly progressing skin changes and systemic toxicity. Toxic shock syndrome (TSS), associated with *Staphylococcus aureus* or group A streptococci, features fever, a widespread rash, and multi-organ involvement, requiring immediate recognition and supportive care. Lastly, miliary tuberculosis may present with nonspecific symptoms, including fever and rash, particularly in immunocompromised patients, and often leads to delayed diagnosis. Recognizing these emergencies is crucial for effective management and improved patient outcomes. Clinicians must maintain a high index of suspicion for these conditions in patients presenting with fever and rash.

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Management of Well-appearing, Term Infants with Fever

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Keywords:
Well-appearing, Term infants, Herpes simplex virus, Therapeutic intervention

ABSTRACT

This guideline addresses the evaluation and management of well-appearing, term infants, 8 to 21 days of age, with a fever 38 Č. This is Evidence-based review by the Agency for Healthcare Research and Quality, an additional review of the literature, and supplemental data from published, peer-reviewed studies provided by active investigators, 21 key action statements for eligibility, this guideline addresses febrile infants who: are well appearing, have documented rectal temperatures of 38°C or Infants with the following may be included: Otitis media, Current or recent use of anti-microbial agents in infants older than 2 weeks and positive viral test results. Excluded infants are: Preterm infants (<37 weeks' gestation), Infants younger than 2 weeks of age whose perinatal courses were complicated by maternal fever, infection, and/or antimicrobial use, Febrile infants with high suspicion of herpes simplex virus (HSV)infection (eg, vesicles), Infants with a focal bacterial infection (eg, cellulitis, omphalitis, septic arthritis, osteomyelitis). These infections should be managed according to accepted standards, Infants with clinical bronchiolitis, with or without positive test results for respiratory syncytial virus (RSV), Infants with documented or suspected immune compromise, Infants whose neonatal course was complicated by surgery or infection, Infants with congenital or chromosomal abnormalities, Medically fragile infants require some form of technology or ongoing therapeutic intervention to sustain life, Infants who have received immunizations within the last 48 hours. The incidence of postimmunization fevers 38.0 C is estimated to be >40% within the first 48 hours. Procalcitonin >0.5 ng/mL, CRP >20 mg/L, and ANC >4000, >5200 per mm3 (for infants with polycythemia) are considered as inflammation factors. HSV should be considered if the mother has genital HSV lesions or fever from 48 hours before to 48 hours after delivery and in infants with vesicles, seizures, hypothermia, mucous membrane ulcers, CSF pleocytosis in the absence of a positive Gram stain result, leukopenia, thrombocytopenia, or elevated alanine aminotransferase levels. Discontinue of Anti-microbial agent and discharge hospitalized newborns: 1- Culture results are negative for 24 to 36 hours or only positive for contamination. 2- The infant continues to appear clinically well or is improving (eg, fever, feeding). 3- There are no other reasons for hospitalization.

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A Review on Causes of Infection in Patients with CHD

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Keywords:
Infections, Congenital heart disease, Infection control protocols, Hand Hygiene

ABSTRACT

Infections have significant burden for children with congenital heart disease (CHD), which can detoriate their heath status significantly. Awareness of infection causes is the key of optimal management, causes such as: inadequate treatment of heart failure, an indwelling central venous catheter, associated anomalies such as cleft palate, and immune deficiency due to malnutrition or as a part of syndrome (like DiGeorge syndrome). Most children with CHD have multiple risk factors so there is a high risk of different kinds of infections especially aggressive bacterial or fungal infections. Up to date vaccination, good nutrition, early corrective surgery, early removal of central venous catheters are measures to reduce risk of infection in this vulnerable group. Different studies showed strict adherence to infection control protocols, specially "hand Hygiene" play practical role to decrease the risk of infection and sepsis in children with CHDs.

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Evaluation of Lymphadenopathy in Children

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Keywords:
Lymphadenopathy,
Children,
Lymphadenitis

ABSTRACT

The lymphatic system is one of the important parts of the immune system, which includes vessels and lymph nodes, spleen, thymus, adenoids, tonsils and plaques in the wall of the small intestine. Correct treatment of children's lymphadenopathy as a common finding in the routine examination of any child is necessary. When a palpable lymph node needs to be examined and followed up and when to take a sample is a question that needs to be investigated and followed up. By taking the history, description of the condition and then a detailed examination of the child including the characteristics of the lymph node ; the lymphadenopathy is localized or generalized, and the examination of accompanying symptoms and signs such as the organomegaly، mucosal skin lesions, the presence of danger signs of fever, weight loss and sweating; we can evaluate the patient properly.The cause of lymphadenopathy in a child can be an insignificant and common finding such as lymphadenopathy. Pursuing upper respiratory infections to a serious diagnosis varies. Therefore, adequate knowledge of how to evaluate this finding in order to avoid spending additional costs in unimportant cases until referring to the child's place in dangerous cases is needed by doctors.

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Prevention of Surgical Site Infections (SSIs)

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Keywords:
Surgical site infections,
Prevention,
Prophylactic antibiotics,
Wound management

ABSTRACT

The human and financial costs of treating surgical site infections (SSIs) are increasing. The number of surgical. procedures performed in the United States continues to rise, and surgical patients are initially seen with increasingly complex comorbidities. It is estimated that approximately half of SSIs are deemed preventable using evidence-based strategies. Preventing surgical site infections (SSIs) is crucial for patient safety and can significantly improve surgical outcomes. Here are several key strategies to help prevent SSIs: Preoperative Measures: 1. Patient Education: Inform patients about the importance of hygiene before surgery, including showering with antiseptic soap. 2. Screening and Decontamination: Screen patients for nasal carriage of *Staphylococcus aureus* (e.g., MRSA) and consider decolonization strategies if necessary. 3. Optimizing Health Conditions: Manage chronic conditions (like diabetes) and encourage smoking cessation to improve overall health. 4. Antibiotic Prophylaxis: Administer prophylactic antibiotics within the appropriate time frame before surgery, following guidelines for the specific procedure. 5. Hair Removal: If necessary, remove hair using clippers instead of razors to minimize skin irritation and the risk of infection. Intraoperative Measures: 6. Sterile Technique: Ensure that all surgical instruments and materials are sterile. Maintain a sterile field throughout the procedure. 7. Surgical Attire: Use appropriate surgical attire, including masks, gowns, gloves, and caps, to reduce the risk of contamination. 8. Environmental Control: Maintain a clean operating room environment with proper ventilation and temperature control. 9. Minimize Operating Time: Plan and execute the surgery efficiently to reduce the duration of exposure. 10. Wound Management: Use proper techniques for wound closure and consider using antimicrobial sutures if indicated. Postoperative Measures: 11. Wound Care Instructions: Provide clear instructions for wound care to patients post-surgery, emphasizing the importance of keeping the area clean and dry. 12. Monitoring for Signs of Infection: Educate patients on recognizing signs of infection (redness, swelling, increased pain, fever) and advise them to seek medical attention if they occur. 13. Follow-Up Care: Schedule: regular follow-up visits to monitor the surgical site and address any complications early.

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Investigating The Relationship between Idiopathic Hypercalciuria and Recurrent Urinary Tract Infection in Children

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Orals

Keywords:
Hypercalciuria, Recurrent urinary tract infection, Children, Calcium/creatinine ratio

ABSTRACT

Introduction: Urinary tract infection (UTI) is a very common and important issue in children and the second cause of bacterial infection in this group. Studies have been conducted to assess the relationship between hypercalciuria and recurrent UTI; however, controversies have remained. The aim of our study is to assess the relationship between idiopathic hypercalciuria and recurrent UTI in 6 months to 16 years old children, who referred to Dr. Sheikh and Akbar hospitals.

Materials and Methods: This case-control study was conducted between January 2018 to December 2020. Fifteen children with recurrent UTI (2 or more infections during 6 months or 3 or more infections during one year) as the case control were compared with 50 healthy children without the history of UTI. After a negative urine culture, the random calcium/creatinine ratio was measured and ratios more than 0.8, 0.6, 0.5, and 0.2 were considered as hypercalciuria in ≤ 6-months children, 7 to 12-months children, 12 to 24-months children, and ≥ 24-months children, respectively. In order to rule out secondary hypercalciuria, the serum levels of calcium, phosphorus, alkaline phosphatase, urea, and creatinine were assessed. The two study groups were compared in case of hypercalciuria. Logistic regression was used to assess the relationship of hypercalciuria with recurrent UTI. p values less than 0.05 were considered significant.

Results: Totally, 50 cases and 50 controls were enrolled in the study. There was no significant difference in case of age (p=0.233), gender (p=0.835), and calcium to creatinine ratio (p=0.245) between the two study groups. The isolated germs in urinary culture were *E.coli* with 37 cases (74.0%), *Klebsiella* with 8 cases (16.0%), *Proteus* with 2 cases (4.0%), *Pseudomonas* with 2 cases (4.0%), and *Entrobacter* with 1 case (2.0%). In case of the distribution of abnormal and normal calcium/creatinine ratio, there was a significant difference between cases and controls (p=0.046). However, there was no significant relationship between calcium/creatinine ratio and urinary tract infection (OR=0.219; 95% CI= (1.088-0.044); p value=0.063).

Conclusion: There was no significant relationship between hypercalciuria and recurrent UTI in pediatric cases, in our study. However, further studies are needed to confirm these results.

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Extreme Low Frequency (ELF) Electromagnetic Fields as An Antimicrobial Method

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Keywords:
Extreme low frequency (ELF) electromagnetic fields, Antimicrobial method

ABSTRACT

Extreme Low Frequency (ELF) electromagnetic fields (EMF), defined as electromagnetic waves with frequencies between 0 to 300 Hz, have garnered attention as a potential antimicrobial method, especially in light of rising antimicrobial resistance (AMR). ELF-EMF exposure has shown promise in disrupting microbial cell functions, offering a non-invasive, drug-free alternative for treating infections caused by bacteria, fungi, and viruses. This paper reviews the mechanisms, experimental findings, clinical applications, and challenges associated with ELF-EMF as an antimicrobial treatment. ELF-EMF exerts its antimicrobial effects through various mechanisms. It can disrupt microbial cell membranes, causing permeability changes that lead to leakage of intracellular contents and cell death. ELF-EMF also induces oxidative stress by generating reactive oxygen species (ROS), which damage cellular components like DNA, proteins, and lipids. Additionally, ELF-EMF affects microbial DNA replication and can interfere with ion concentrations, disrupting essential cellular functions. Notably, ELF-EMF has shown the ability to inhibit biofilm formation, which is a major challenge in treating chronic infections. The antimicrobial spectrum of ELF-EMF is broad. It has been demonstrated to inhibit the growth of both Gram-positive and Gram-negative bacteria, such as **Escherichia coli**, **Staphylococcus aureus**, and **Pseudomonas aeruginosa**. ELF-EMF has also proven effective against fungal pathogens like **Candida albicans** and has shown potential in reducing viral infectivity, although research in this area is still limited. Moreover, ELF-EMF's ability to disrupt biofilms makes it particularly useful in treating chronic infections, including those associated with cystic fibrosis or urinary tract infections. Clinical applications of ELF-EMF are still in the early stages but have shown promise in areas such as wound healing, chronic infections, periodontal disease, and biofilm-related conditions. Studies suggest that ELF-EMF can enhance healing and reduce microbial load in diabetic foot ulcers, promote periodontal health, and aid in treating chronic osteomyelitis. Furthermore, its potential to improve antibiotic efficacy when combined with conventional therapies, particularly in drug-resistant infections, is being explored. Despite its potential, ELF-EMF faces challenges, including the need for standardized treatment protocols, further clinical validation, and the development of effective ELF-EMF delivery technologies. However, with continued research, ELF-EMF

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Photodynamic Therapy as An Antimicrobial Method

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Photodynamic therapy, Antimicrobial

ABSTRACT

Photodynamic therapy (PDT) is an emerging alternative to traditional antimicrobial treatments, particularly in the face of rising antimicrobial resistance (AMR). PDT involves the use of light-activated photosensitizers that, upon exposure to specific wavelengths of light, generate reactive oxygen species (ROS) capable of damaging microbial cells. These ROS can disrupt cell membranes, inactivate proteins, damage DNA, and even induce immunological responses, making PDT effective against a wide range of pathogens, including bacteria, fungi, viruses, and biofilm-associated microorganisms. PDT's antimicrobial spectrum is broad, making it useful against both Gram-positive and Gram-negative bacteria, such as *methicillin-resistant Staphylococcus aureus* (MRSA), *Pseudomonas aeruginosa*, and *vancomycin-resistant Enterococcus* (VRE). It is also effective against fungal pathogens like *Candida albicans* and *Aspergillus* species, and viruses, including Herpes simplex virus and influenza. PDT has demonstrated particular promise in treating chronic infections, especially those caused by biofilms, which are notoriously resistant to conventional therapies. Clinically, PDT has been successfully applied in treating chronic wound infections, periodontal disease, respiratory infections, dermatological conditions, and urinary tract infections. It has also shown efficacy in reducing bacterial loads in chronic lung infections and promoting healing in diabetic or vascular wounds. PDT is increasingly seen as an adjunct therapy, often combined with antibiotics to enhance treatment outcomes, especially for drug-resistant infections. The advantages of PDT include its low risk of resistance development, minimal side effects, and the ability to treat biofilm-associated infections. Since PDT does not rely on traditional antimicrobial mechanisms, such as targeting specific bacterial enzymes, it is less likely to promote resistance. Additionally, PDT can be localized to the infection site, reducing systemic toxicity. However, PDT faces challenges that limit its widespread adoption. These include the depth of light penetration, the potential toxicity of photosensitizers, and the need for specialized equipment. Furthermore, while PDT has been used in cancer therapy, its role in infectious diseases is still under investigation, and more clinical trials and regulatory approvals are needed. Despite these challenges, PDT holds significant promise as an antimicrobial treatment and could become an important tool in managing infections, particularly in an era of increasing antimicrobial resistance.

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Prevention of Catheter- Associated Urinary Tract Infections (CAUTI)

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ARTICLEINFO

Orals

Keywords:
Urinary tract infection, Catheter-associated urinary tract infection, Healthcare-associated infection, Aseptic technique, Catheter maintenance.

ABSTRACT

Introduction: Catheter-associated UTIs (CAUTIs) contribute to increased morbidity, mortality, hospital cost, and length of stay. In addition, bacteriuria commonly leads to unnecessary antimicrobial use and urinary drainage systems can become reservoirs for pathogens Aim: The aim of this study is to provide an overview of strategies for the prevention of CAUTIs based on global guidelines and evidence-based practices.

Materials and Methods: This narrative review was conducted by examining up-to-date and validated international guidelines on CAUTI prevention in 2024.

Results: Strategies for preventing CAUTI are categorized into three main areas: 1- Appropriate Urinary Catheter Use (Urinary catheters should be used only when absolutely necessary and should be removed as soon as possible. Alternatives to indwelling catheterization should be considered for selected patients when appropriate). 2-Proper Techniques for Urinary Catheter Insertion (Hand hygiene must be performed immediately before and after catheter insertion. Only trained personnel should perform the procedure, following aseptic techniques. Insertion should be done using sterile gloves, drapes, gauze, an antiseptic or sterile solution for cleaning, and a single-use lubricant packet. The skin around the meatus should be cleaned prior to and routinely after insertion, and indwelling catheters should be secured properly to avoid movement and urethral traction. A catheter with the smallest appropriate bore size should be selected to reduce trauma to the bladder neck and urethra, avoiding larger sizes (e.g., 18 Fr or larger) unless clinically necessary). 3-Proper Techniques for Urinary Catheter Maintenance (Following aseptic insertion, a closed drainage system must be maintained, and urine flow should be kept unobstructed. Standard precautions, including the use of gloves and gowns, should be followed during any manipulation of the catheter or collection system to prevent infection).

Conclusion: Implementing these evidence-based strategies can significantly reduce the risk of CAUTI and improve patient outcomes in healthcare settings. Adhering to strict protocols for catheter use, insertion, and maintenance is crucial for CAUTI prevention.

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Prevention of Infections Related to Medical Devices (Peripheral and Central Vascular Catheters)

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ARTICLEINFO

Orals

Keywords:
Catheter-related infection, Vascular access, Central catheters, Peripheral catheters

ABSTRACT

One of the most common complications of vascular catheters is catheter infection. The risk of catheter-related bloodstream infection following central venous catheters is several times that of peripheral catheters. Skin microorganisms (especially Staphylococcus) are the most common cause of infection due to vascular catheters. The use of color Doppler ultrasound during the placement of central catheters causes more success in performing the operation and inserting the catheter with the first step and ultimately reducing the risk of infection. Catheter infection may be extra-luminal or intraluminal. Extraluminal infection can be prevented by proper methods. Such as, the correct method of inserting the catheter, using maximum personal protective equipment during the insertion of the catheter, washing hands before manipulating the catheter and disinfecting the skin. Intra-luminal infection may be due to contamination of the injection solution, lack of awareness and adherence of physicians and nurses to instructions when using catheters and bacteremia caused by infection in other parts of the body. Currently, bacteremia associated with long-term catheters is mostly of intraluminal origin. The rate of blood infection caused by catheter varies from one country to another or even from one hospital to another. It depends on the type of catheter, the frequency of catheter replacement and manipulation, and patient-related factors such as the underlying disease and its severity. In case of infection of temporary catheters, the catheter should be removed immediately. Re-insertion in the same site should be prevented. In case of infection in permanent catheters, intravenous antibiotics can be used in one or two steps to control the infection. Intravascular catheter-related infections are a major cause of morbidity and mortality. Management of catheter-related infection varies according to the type of catheter involved (temporary or permanent). Catheter-related infections may be tunnel infection or catheter-related bacteremia. Replacement of vascular catheters may be unnecessary if the catheter remains functional and there are no signs of inflammation or infection. Costs associated with routine replacement may be considerable. So, Replacement of intravenous catheters can be done based on clinical need rather than a routine procedure.

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Infectious Complications in Pediatric Cancer Patients

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ARTICLEINFO

Orals

Keywords:
Cancer, Infectious diseases, Pediatric patients, Susceptibility

ABSTRACT

Infectious diseases are major causes of morbidity and mortality in pediatric patients with cancer. The advances in supportive care during the past *several* decades have permitted patients to successfully recover from the impact of cytotoxic cancer chemotherapy, hematopoietic stem cell transplantation (HSCT), radiation therapy, surgical intervention, and profound immunosuppression. Factors leading to the susceptibility to infections in oncology patients are: underlying disease: Patients with leukemia, advanced-stage lymphoma and uncontrolled tumors are more prone to infections. Type of therapy: Dose-intensive therapies, high-dose cytosine arabinoside and stem cell transplantation render patients more susceptible to infections. Degree and duration of neutropenia: The most important determinant of susceptibility to bacterial and fungal infections is the number of circulating neutrophils. Patients who are neutropenic (absolute neutrophil count [ANC] ,500/mm3) are more susceptible to infection. Neutropenia can be secondary to disease (leukemia, aplastic anemia) or chemotherapy. Neutrophil function may also be impaired by disease and by chemotherapy. Disruption of normal barriers: The normal mechanical barriers to infection in the skin, respiratory, gastrointestinal and genitourinary systems are disrupted. Nutritional status: Malnutrition affects the function of lymphocytes, neutrophils, mononuclear cells and the complement system. Humoral immunity: Defects in humoral immunity result in susceptibility to encapsulated bacteria including *Streptococcus pneumoniae*, *Haemophilus influenza* type b and *Neisseria meningitides*.

• Cell-mediated immunity: Defects in cellular immunity produce susceptibility to viruses, fungi and intracellularly multiplying bacteria (e.g., *Listeria*, *Salmonella* and *Mycobacterium tuberculosis*). Patients with Hodgkin disease and non-Hodgkin lymphoma have impaired cell-mediated immunity. Chemotherapy, radiation and corticosteroids induce defects in lymphocyte function. Lymphopenia may persist after completion of chemotherapy. Colonizing microbial flora: Most bacterial infections arise from endogenous microflora Foreign bodies: Indwelling central vascular catheters, ventriculoperitoneal shunts. Fever in the neutropenic patient is a common manifestation of infection in pediatric oncology. The most important advance in infectious diseases oncology supportive care leading to improved survival has been the prompt initiation of empirical antibacterial antibiotics when the neutropenic cancer patient becomes febrile.

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Human Gut Microbiota and Bacterial Antibiotic Resistance

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ARTICLEINFO

Orals

Keywords:
Human gut microbiota, Bacteria, Antibiotic resistance

ABSTRACT

Recently some concern has been aroused about the role of the human gut microbiota in the antibiotic resistance. The human gut microbiota plays a significant role in bacterial antibiotic resistance. First, human gut microbiota can work as a big reservoir of resistance genes. The gut microbiota contains a diverse array of bacteria, some of which may possess genes that confer resistance to antibiotics. These resistance genes can be transferred between bacteria through horizontal gene transfer. This sharing of genetic material can lead to the spread of antibiotic resistance among both commensal and pathogenic bacteria. Also human gut microbiota is reservoir of resistance bacteria as the use of antibiotics creates selective pressure in the gut environment. Antibiotics can kill susceptible bacteria, allowing resistant strains to thrive and proliferate. This can lead to an increase in the prevalence of antibiotic-resistant bacteria within the gut microbiota. Most importantly antibiotic usage can disrupt the normal balance of the gut microbiota, leading to alteration of microbial composition and dysbiosis (an imbalance of microbial populations). This dysbiosis can allow opportunistic pathogens that are resistant to antibiotics to colonize and persist in the gut. Biofilm formation is another role of human gut microbiota in bacterial resistance. Some gut bacteria can form biofilms, which can harbor resistant bacteria and make it more difficult for antibiotics to penetrate and exert their effects. The gut microbiota can influence the metabolism of antibiotics, either by modifying the drug itself or by affecting the host's metabolism. Certain gut bacteria can produce enzymes that inactivate antibiotics, reducing their efficacy. Similarly the gut microbiota plays a crucial role in modulating the host's immune response. An altered immune response due to changes in the microbiota can impact the ability of the body to control infections caused by antibiotic-resistant bacteria. Overall, the interactions between the gut microbiota and antibiotic resistance are complex and multifaceted, highlighting the importance of understanding these dynamics in the context of antibiotic use and infection management. Efforts to preserve and restore a healthy gut microbiome may be critical in combating antibiotic resistance.

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Evaluation of Epidemiological Characteristics, Clinical and Laboratory Features and Outcome of Children with Diabetic Ketoacidosis in Coronavirus 19 Pandemic

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ARTICLEINFO

Orals

Keywords:
Diabetic ketoacidosis, COVID-19 pandemic, Clinical and laboratory characteristics, Children

ABSTRACT

Introduction: Considering that the COVID-19 pandemic may be effective on the rate and severity of diabetic ketoacidosis (DKA) incidence, the present study was conducted to determine the characteristics, clinical and laboratory characteristics of children with DKA in the COVID-19 pandemic.

Materials and Methods: This cross-sectional study was conducted from July 2021 to June 2022 in the Akbar Children's Hospital of Mashhad, and all children under 18 years of age who were admitted with a diagnosis of DKA based on the ISPAD2018 protocol were included in the study. a checklist was used to obtain necessary information including demographic information (such as age and sex), clinical symptoms at the time of hospitalization (abdominal pain, nausea and vomiting, etc.), laboratory findings (PH, HCO3, COVID-19 nasopharynx PCR, etc.), hospitalization in ICU and prescribed medicines. The information of the DKA patients who were admitted in 2019 was also accessed from the patient files that were available in the hospital archive. Finally, the obtained information was analyzed by SPSS statistical software.

Results: A total of 310 patients were included in the study, of which 176 patients (56.8%) were male and the rest were female. Before the COVID-19 pandemic, only 33% of DKA patients were new cases of diabetes, while during the pandemic, this rate reached 57.2% ($p=0.006$). Polyphagia ($p=0.034$), weight loss ($p=0.025$), tachycardia ($p<0.001$), tachypnea ($p<0.001$) and weakness ($p<0.001$) were more common during COVID-19, but abdominal pain ($p<0.001$) and vomiting ($p<0.001$) were reported more in the pre-pandemic period. Also, the need for ICU admission during the pandemic was significantly higher than before ($p=0.003$).

Conclusion: Based on the results obtained in the present study, during the COVID-19 era, more patients with type 1 diabetes were newly diagnosed with DKA. This issue may be due to patients not visiting when they develop mild symptoms of type 1 diabetes due to the fear of COVID-19, or due to the role of the SARS-CoV-2 in diabetes.

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Nutrition and Immunity

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ARTICLEINFO

Orals

Keywords:
Nutrition, Immunity, Diet, Vitamin, Mineral, Malnutrition

ABSTRACT

Our Mother Was Right- We really should eat our broccli… How nutrition affects your Immune System. Nutrition-Immunity links to macronutrient deficiency, protein and calories. Malnutrition is the most common cause of immune deficiency world-wide. Micronutrient deficiency, elements, vitamins and overnutrition, excess of macronutrients, vitamins (A, B6 ،B12, folate, C, D and E), trace elements (zinc, copper, selenium and iron), amino acids and fatty acids have key roles in supporting the human immune system and reducing risk of infections. Each of the nutrients named above has roles in supporting antibacterial and antiviral defense, but zinc and selenium seem to be particularly important for the latter. Steps are needed to support the immune system through good nutrition. Vitamins (A, B6, B12, folate, C, D and E) and trace elements (zinc, copper, selenium, iron) are vital for supporting immune function. Other essential nutrients including other vitamins and trace elements, amino acids and fatty acids are also important in this regard. Diet or Supplementation? It is clear that situations of frank essential nutrient deficiency impair immune function and increase susceptibility to infections and that these two outcomes can both be prevented or reversed by treating the deficiency(ies). This may be through diet or in some cases may require supplementation or some other form of therapeutic administration, depending on the nutrient, the extent of the deficiency and the setting. Moving away from frank deficiency, there will be individuals in all populations who have 'suboptimal' intakes and status of one or more essential nutrients. It is not entirely clear the extent to which immune Good dietary sources of key nutrients that support the immune system. Best diet to support the immune system is one with a diverse and varied intake of vegetables, fruits, berries, nuts, seeds, grains along with some meats, eggs, dairy products and oily fish. This diet is consistent with those regarded as generally healthy and is consistent with current dietary guidelines. Such a diet would preclude too much processed and 'junk' food and excessive amounts of saturated fat and sugar. in those individuals will be compromised.

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Patients` Participation in Hand Hygiene in A Specialized Children Hospital

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Orals

Keywords:
Hand hygiene, Children, Health care workers

ABSTRACT

Introduction: Hand hygiene (HH) has been considered the most important measure to reduce the transmission of microorganisms in health services for many years. This practice is recognized above all as a simple, effective and cost-effective way to reduce healthcare associated infections (HAIs) by international agencies such as the World Health Organization (WHO) and the Centers for Disease Control and Prevention (CDC) is known. Various interventions have been effective in improving hand hygiene, including the patients' participation in hand hygiene by health care workers.

Materials and Methods: This cross-sectional study was conducted in Akbar Children's Hospital of Mashhad in a period of one month in 2024. After obtaining the consent of the hospitalized patients and their companions, the hand hygiene educational package containing hand rub and short educational videos was given and they were asked to thank the health care workers (HCWs) for hand hygiene and remind them of this importance (regardless of whether that person washed their hands in their presence or not). Then, on the 1st-3rd day after hospitalization, the participation of patients and their companions in the field of hand hygiene reminders was evaluated. Data was entered into SPSS software version 26 and analyzed.

Results: Out of a total of 177 participants in this project, only 29% had warned patients about hand hygiene. Also, 13% believed that the health care workers took care of their patients without observing hand hygiene. Despite the training, only 30% had reminded HCWs about hand hygiene by thanking them for washing their hands. 122 people (69%) listed the most important reason for not notifying the HCWs, the observance of hand hygiene by the personnel themselves.

Conclusion: In this research, less than half of patients' companions participated to remind the health care workers about hand hygiene. More effective training and wide awareness in this field seems necessary.

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Pediatric Botulism in North East of Iran

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Orals

Keywords:
Botulism, Foodborne, Children

ABSTRACT

Introduction: Botulism is a very dangerous disease caused by the toxin of Clostridium botulinum bacterium. There are different types of this disease, and considering that it is not usually prevalent and in people under 18 years of age, its diagnosis is associated with challenges and delays due to its similarity with some other diseases. Therefore, it is necessary to familiarize the treatment staff with this disease from various aspects and it is necessary to check the disease outbreak situation in different regions. This cross-sectional study was conducted with the aim of investigating the epidemiological situation of food borne botulism in the age group of children aged 0 to 18 years in Razavi Khorasan region of Iran during the last 6 years from 2018 to 2023.

Materials and Methods: This cross-sectional study was conducted based on the available statistics of the number of botulism cases in the age group of one-month to 18-year-old children in Razavi Khorasan region of Iran during the last 6 years from 2018 to 2023.

Results: In the review of statistics obtained from health centers in the last 6 years, the incidence of foodborne botulism in children, respectively: In 2018, 5 cases, 100% males, in 2019, 6 cases, 50% males, in 2020, 5 cases, 60% males, in 2021, no report, and in 2022, 5 cases 40% males, and in 2023, 6 cases, 80% were male. The general age range of the patients was from one month to 18 years old. The most common sources of the disease were as follows: 23% were canned vegetables, 18% canned fish, and 11% dairy products that are kept in an anaerobic environment (some types of yogurts, buttermilk, and local curd). The most common initial symptoms were dysphagia and dysphonia. During the last 6 years (study period) in the age group of children with botulism, there was zero mortality and all cases improved with anti-botulinum treatment and respiratory support, etc.

Conclusion: Adequate education about the sources of botulism disease as well as the symptoms and methods of diagnosis and the correct principles of treatment of this disease is very necessary.

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Evaluation and Management of Febrile Well Appearing 22-28 Day-old Infants

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Orals

Keywords:
Febrile infants, Well appearing, Management, Antimicrobial therapy

ABSTRACT

The following recommendation is for febrile (temperature >38.0C), well-appearing, term infants 22 to 28 days old without risk factors. Algorithm summarizes the recommendations. Clinicians should obtain urine specimen, Blood Culture and inflammatory markers (IMs). If urinalysis result is positive, should obtain a suprapubic aspiration or catheterization specimen for culture. If any IMs obtained is positive, should obtained CSF for analysis and bacterial culture. If CSF analysis suggests bacterial meningitis; or urinalysis result is positive, should prescribed parenteral antimicrobial therapy in a hospital. For infants who will be managed at home, parenteral antimicrobial therapy should be administered until to prepare the answer of the cultures. Infants may managed at home If urinalysis and IM and CSF analysis are normal or enterovirus-positive and verbal teaching and written instructions have been provided for monitoring throughout the period of time at home and Follow-up plans for reevaluation in 24 h have been developed and are in place. Plans have been developed and are in place in case of change in clinical status, including means of communication between family and providers and access to emergency medical care. When CSF is not obtained or is uninterpretable, Should hospitalized infants in hospital. After 24 to 36 h of negative culture results if the infant is clinically well or improving (e.g., fever, feeding); and there are no other reasons for hospitalization, Should discontinued antimicrobial agents and discharged hospitalized infants. Infants Should treated positive bacterial pathogens in urine, blood, or CSF with targeted antimicrobial therapy for the duration of time consistent with the nature of the disease, responsible organism, and response of the infant to treatment.

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Rational Prescription of Antibiotics in Pediatric Pneumonia

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Keywords:
Pneumonia, Antibiotics, Children

ABSTRACT

Pneumonia is one of the tenth causes of mortality in developing countries. Pneumococcus is the leading cause of bacterial pneumonia in children. Blood culture is only positive in 10 percent of hospitalized children with pneumonia. Treatment of bacterial pneumonia depends on clinical presentation, age of child and probable cause. In outpatient situation high doses of amoxicillin is recommended. Cefuroxime and co-amoxiclauv are treatment alternatives. In school age children a macrolide or doxycycline maybe prescribed. Levofloxacin can be done in adolescents. In admitted children ceftriaxone or cefotaxime may be administered. When clinical presentation or immune background is suggestive of staphylococcal pneumonia, clindamycin or vancomycin will be added to the treatment. There is no antibiotic treatment for viral pneumonia, but up to 30 percent of viral infections accompanied by bacterial causes. Procalcitonin is a biomarker for the early detection of systemic bacterial infection and has been used for discontinuation of antibiotic treatment. Pneumococcal conjugate and influenza vaccinations are effective ways for preventing bacterial pneumonia.

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Precocious Puberty in The Post-Covid- 19 Era

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ARTICLEINFO

Orals

Keywords:
Puberty, Precocious puberty, Covid- 19

ABSTRACT

Puberty is defined as the transition period between childhood and adulthood. Maturity of the hypothalamus-pituitary gonadal axis leads to the development of secondary sexual characteristics. Precocious puberty is defined as the appearance of secondary sexual characteristics before 8 years in girls and 9 years in boys. Increased central precocious puberty (CPP) incidence after coronavirus infectious disease-19 has been reported. Many studies have shown that the incidence of CPP increased during the pandemic compared to the pre-pandemic era. Multiple theories have been proposed to explain this increase in the rate of precocious puberty including the direct effect of SARS-coV-2 infection on the hypothalamus-pituitary gonadal axis, increased body mass index of adolescents due to sequential lockdowns and inactivity, changes in sleep patterns, increased use of media and electronic devices and increased levels of stress, and additionally potential earlier detection of signs of CPP by parents and caregivers. More studied are needed to evaluate the effects of these factors.

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Clinical Presentation of UTI

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ARTICLEINFO

Orals

Keywords:
Urinary tract infection, Clinical presentation, Children

ABSTRACT

UTI symptoms are influenced by: The age at presentation, level of infection, nature and virulence of the organism, the child's innate immune response. Clinical Presentation in Newborns and infants: Fever may be the only presenting symptom ,Prolonged neonatal jaundice Irritability and listlessness, Vomiting, Slow feeding, Poor weight gain In older children, fever, urinary symptoms (dysuria, urgency, frequency, new-onset incontinence), abdominal pain, suprapubic tenderness, and costovertebral angle tenderness . The constellation of fever, chills, and flank pain is suggestive of pyelonephritis in older children, Voiding problems including hyperactive and dysfunctional bladder emptying may be associated with recurrent cystitis and less commonly recurrent febrile UTIs

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Poor Feeding and Respiratory Distress in Neonate, Don't Forget The Heart: Myocarditis, Endocarditis

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ARTICLEINFO

Orals

Keywords:
Poor feeding,
Respiratory distress,
Myocarditis,
Endocarditis, Neonate

ABSTRACT

A common scenario in NICU is poor feeding and respiratory distress. Acute myocarditis and endocarditis (IE) are not common, but may present with these nonspecific findings. Rapid recognition and suitable support gives these infants the best possible chance of survival. Neonatal IE: Many cases occur in structurally normal hearts as well as with CHD conditions. Although still relatively uncommon, rising numbers of cases of neonatal IE continue to be reported. This may reflect marked increases in cardiovascular interventions and concomitant increased use of prosthetic intravascular devices and insertion of long-term indwelling central venous catheters. Endocarditis should be suspected in any neonate, particularly a premature infant, with an indwelling vascular catheter, evidence of sepsis, and new or changing heart murmurs. Myocarditis in neonates: vertical transmission before birth (transplacental), exposure to maternal blood or secretions during delivery or horizontal transmission from family members or healthcare workers are three main causes of neonatal viral myocarditis. Presentation of myocarditis in neonate is not specific. CXR, Laboratory Evaluation, ECG, ECHO, CMR, Endomyocardial biopsy will help in accurate diagnosis.

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A Review of Scientific Literature on The Role of Nutrition in Infection

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ARTICLEINFO

Orals

Keywords:
Nutrition, Gut microbiota, Infection, Prebiotics

ABSTRACT

Nutrition plays a critical role in supporting immune function and preventing infections. Research highlights the significance of probiotics and prebiotics in enhancing gut health. Probiotics improve immune responses and have been shown to prevent gastrointestinal infections by modulating gut microbiota and fostering beneficial bacteria. Similarly, prebiotics serve as food for probiotics, thereby supporting their growth and contributing to overall immune modulation. Nutritional supplements, including vitamins and minerals, are essential for immune support. vitamins A, C, D, trace elements like selenium and zinc, essential amino acids, and fatty acids significantly influence immune system development and function through various mechanisms. These nutrients are crucial in maintaining an effective immune response against pathogens. Fermented foods like yogurt, kefir, and kimchi contain probiotics and bioactive peptides that improve gut microbiota, enhance gut health, and regulate immunoglobulins and inflammatory cytokines. The consumption of these foods can lead to improved gastrointestinal health and may reduce the risk of infectious diseases. Furthermore, dietary patterns influence susceptibility to infections. Diets rich in fruits, vegetables, and functional foods are associated with better immune responses. Bioactive compounds found in foods have demonstrated antimicrobial effects, contributing to infection control. In conclusion, a comprehensive understanding of how nutrition affects the immune system can inform dietary strategies aimed at reducing infection risk and improving health outcomes.

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A study on The Prevalence of HPV among Women Working in Factories in Mashhad in 2022

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Keywords:
HPV, Cervical cancer, Screening, Women working in factories

ABSTRACT

Introduction: HPV causes over 630,000 cancers worldwide annually. With the rapid increase in the incidence of cervical cancer, anal cancer, and other cancers, human papilloma virus infection has become an increasing concern. Cervical cancer is the fourth most common malignancy in women worldwide and poses a serious threat to their health. Given these points, clinical trials in women are one of the most important measures needed to prevent and control the spread of this virus.

Materials and Methods: In this descriptive study, 266 women working in factories in the Mashhad industrial park (more than 35 factories) were selected through probabilistic and accessible sampling. A multifaceted questionnaire (identifying high-risk groups based on the national program guidelines) was conducted to investigate HPV and cervical cancer. After completing the questionnaire and examinations, all participants were encouraged to undergo HPV testing. For a follow-up trial, after six months, those at risk were contacted again, and the HPV test was repeated.

Results: The average age of the 266 women included in the study was 36.36 ± 6.807 years. Results based on the national cervical cancer prevention and control program screening and HPV screening test conditions showed that in the above population, 13.9% had a history of smear tests, 4 had a history of hysterectomy, 15.4% had watery, foul-smelling, and purulent discharges, 12.8% had cheesy discharges, 6.4% had spotting and pain after intercourse, 5.3% had a history of cervical ulcers, 5 had spotting and abnormal bleeding, and 21.8% reported a history of previous infection. In the patient grouping table for HPV screening, groups three to six needed follow-up and re-evaluation. Given the importance of the subject, all individuals in this study were encouraged to undergo HPV testing, and all participants in the study underwent the test, with 8.7% (22 individuals) testing positive. Of these, 6 individuals tested positive for genome 16 or 18, and after follow-up and telephone contact, they were referred to a gynecologist.

Conclusion: Given the importance of HPV screening and its direct connection to cervical cancer and subsequent complications, the best method for conducting group education and encouraging HPV testing is through gatherings of women in factories, companies, hotels, etc.

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Anti-cancer Activity of the pCDH-VPR Recombinant Plasmid in Lung Cancer Cell Line

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ARTICLEINFO

Keywords:
Anti-cancer, Plasmid, pCDH-VPR recombinant plasmid, VPR, Viral therapy

ABSTRACT

Introduction: The human immunodeficiency virus type 1 (HIV-1) accessory protein, VPR, arrests the cell cycle of the G2 phase, and induced apoptosis. This VPR-mediated apoptosis can be implicated in an efficient cancer therapy. Here, we screened new candidates for lung cancer cell death by using recombinant pCDH-VPR recombinant plasmid.
Materials and Methods: The cytotoxic effects of pCDH-VPR recombinant plasmid on A549 cells were investigated by flow cytometry and real time PCR assays.
Results: Our results showed that exposure of A549 cells to pCDH-VPR recombinant plasmid led to cell death in 51%, while in 34% is related to necrosis and 16% are related to apoptosis. In the control sample, fusofect, pCDH recombinant plasmid, and pCDH-VPR recombinant plasmid the survival cells were 88.8%, 66.6%, 67.8%, and 51% respectively. In addition, In the control sample, fusofect, pCDH recombinant plasmid, and pCDH-VPR recombinant plasmid the apoptosis was 8.66%, 15.26%, 14.25%, and 14.87% respectively. While, in the control sample, fusofect, pCDH recombinant plasmid, and pCDH-VPR recombinant plasmid the necrosis was 2.56%, 18.1%, 18%, and 34.1% respectively.
Conclusion: Our study indicated that pCDH-VPR recombinant plasmid is associated with anti-cancer activity against A549 cells. While the exact mechanism of the anti-cancer activity of pCDH-VPR recombinant plasmid against A549 remained unknown. But according to the flowcytometry and real-time PCR assays, it seems that necrosis in the presence of pCDH-VPR recombinant plasmid are possible mechanisms of anti-cancer effect against A549 cells.

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Antibiotic Regimens for Managing Ventilator-Associated Pneumonia

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ARTICLEINFO

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Keywords:
Antibiotic regimens, Ventilator-associated pneumonia (VAP), Management

ABSTRACT

Empirical treatment strategies for ventilator-associated pneumonia (VAP) are tailored based on the local distribution of pathogens, their antimicrobial susceptibility profiles, and individual patient risk factors for multidrug-resistant (MDR) organisms. Factors such as recent antibiotic use, prior microbiological data, and the severity of illness play a crucial role in regimen selection. Physicians should assess each patient's risk factors for MDR pathogens, recent antibiotic use, and local resistance patterns to guide initial therapy. Empirical VAP regimens should target *Staphylococcus aureus*, *Pseudomonas aeruginosa*, and other gram-negative bacilli, with adjustments made based on the presence of MDR risks. De-escalating empirical therapy to more targeted treatment is essential once culture and susceptibility data are available. In patients without MDR risk factors, preferred empirical intravenous regimens include Piperacillin-Tazobactam or Cefepime. Where MDR gram-negative bacilli are a concern, and Carbapenem resistance is not present, Meropenem or Imipenem is recommended. For patients with a history of Carbapenem-resistant pathogens, options like Ceftazidime-Avibactam, Ceftolozane-Tazobactam, Imipenem-Cilastatin-Relebactam, or Meropenem-Vaborbactam are suitable. For suspected or confirmed cases of highly resistant *Pseudomonas spp*., *Acinetobacter spp*., or Enterobacterales (including *Klebsiella pneumoniae*) where newer beta-lactam/beta-lactamase inhibitors are unavailable, the addition of Colistin or Polymyxin-B may be warranted. Patients at risk for methicillin-resistant *S. aureus* (MRSA) are best treated with Linezolid or Vancomycin, with alternatives like Ceftaroline, Tedizolid, Telavancin, or Ceftobiprole as options. In cases where both MRSA and MDR gram-negative pathogens are risks, a combination therapy targeting both is recommended.

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Antimicrobial Resistance Panel, Risk Factors and Current Approach to Gram-negative Colonization and Infection, Focusing *Klebsiella Pneumonia*

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ARTICLEINFO

Orals

Key words:
Antimicrobial resistance, Klebsiella pneumonia, Colonization, Risk factors, Enterobacteriaceae

ABSTRACT

The Panel analyzes the prevalence of carbapenem-resistant Enterobacteriaceae (CRE) colonization across different age groups. It also discusses the evidence-based management of multiresistant *Klebsiella pneumonia* epidemiology and treatment. It reveals that children in urban hospitals have the highest colonization rates, reaching 72% . In contrast, adults and the elderly show lower colonization rates, particularly in community settings, where the prevalence is under 2%. The study emphasizes that healthcare exposure, prior antibiotic use, and geographic variations significantly influence these rates, highlighting the importance of monitoring and targeted interventions . Key Points • In urban hospital settings, the prevalence of CRE colonization in children is alarmingly high at 72%. • Rural hospitals show a lower prevalence rate of 61% for CRE colonization among children . • Adults experience a CRE colonization rate of about 17% in urban hospitals compared to just 7% in rural ones. • Community settings maintain low CRE colonization rates below 2% for children and adults. • The elderly are at heightened risk for multidrug-resistant Gram-negative bacteria due to comorbidities and prior antibiotic exposure. • Increased healthcare exposure, especially in ICUs, significantly increases CRE colonization's likelihood. • Geographic disparity affects CRE prevalence, with urban areas generally showing higher rates than rural communities.

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Assessment of Central Nervous System Infections in Liver and Kidney Transplantation: Insights from A Transplant Cohort

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ARTICLEINFO

Orals

Keywords:
Graft rejection, Immune system, Simplexvirus, Nocardia, Toxoplasmosis, Mycobacterium tuberculosis, Cytomegalovirus

ABSTRACT

Introduction: Liver and kidney transplant recipients are vulnerable to various infections, particularly central nervous system (CNS) infections, due to immune system suppression. Timely diagnosis of these infections is crucial to reduce mortality rates. This study aims to investigate the clinical, laboratory, and radiological manifestations of CNS infections in liver and kidney transplant patients admitted to three hospitals in Mashhad, Iran.

Materials and Methods: A retrospective cross-sectional analysis was conducted using data from liver and kidney transplant patients during 2018-2022. Patients diagnosed with CNS infection through clinical examination, lumbar puncture, computed tomography (CT)/magnetic resonance imaging (MRI) were included.

Results: Among the transplant recipients, 11 cases of CNS infection were identified (males:63%). Of the males, 36.4% received kidney transplants, 27.3% received liver transplants, and 18.2% experienced transplant rejection. Among the females, 36.4% received kidney transplants, and 18.2% had transplant rejection. Post-transplantation, 18% experienced early infection, while 82% developed late infection. The identified pathogens causing CNS infection included: *Herpes simplex virus* (18.18%), *Aspergillus*, *Mycobacterium tuberculosis*, *Cytomegalovirus*, *Nocardia*, toxoplasmosis, *Epstein-Barr virus* (9.09% for each), and unidentified (27.27%) of cases. The associations of prednisolone, prograf, Azathioprine, CellCept, Cyclosporine, and Sirolimus with infections were indicated.

Conclusion: Infections pose a significant risk to transplant recipients, including CNS infections that can have severe clinical manifestations. Close monitoring is necessary for patients with specific risk factors, such as chronic pulmonary contamination, unresponsive fever, high-dose corticosteroid therapy, and frequent transplant rejection. Vigilance and careful examination for even minor neurological signs are vital due to the impact of immunosuppressive drugs on infection presentations.

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Bacterial Gastroenteritis

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ARTICLEINFO

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Key words:
Gastroenteritis,
Bacterial, Diarrhea

ABSTRACT

Gastroenteritis is mostly caused by infection with bacterial, viral or parasitic pathogens. Major bacterial pathogens include non-typhoidal *Salmonella*, *Shigella*, *Campylobacter*, and *Yersinia*. Five types of *E. coli* and 2 types of cholera are also common. In terms of clinical manifestations, although it may overlap with the manifestations of viral diarrhea, high fever 40ºC , bloody diarrhea, abdominal pain, absence of vomiting before diarrhea, frequent stools are in favor of bacterial diarrhea. The most important complication of diarrhea in any case is dehydration and electrolyte and acid and base disorders. The complications of bacterial gastroenteritis, especially in HIV-positive people or malnutrition, can be bacteremia. Toxic megacolon, intestinal perforation, and rectal prolapse can occur after *Shigella* and Clostridium difficile infection. HUS occurs in 5-10% of children with STEC infection. Pseudoappendicitis occurs as a result of mesenteric lymphadenitis following Yersinia and sometimes Campylobacter. Many cases of acute gastroenteritis do not require specific laboratory tests. Stool samples can be checked for mucus, blood, and neutrophils. Stool culture should be limited to: patients with clinical features suggestive of acute bacterial gastroenteritis, have moderate to severe disease, are immunocompromised, in outbreaks suspected HUS, or have a highly suggestive epidemiologic history. Treatment: including rehydration, maintenance treatment with ORS, replacement of lost volume and continued feeding with breast milk and age-appropriate food, not restricting diet, zinc supplementation in developing countries and antibiotics in special cases.

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Behind the White Coat: Delving into the Mental Health Struggles of Medical Students during the COVID-19 Pandemic

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ARTICLEINFO

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Keywords:
Depression, Social interaction, Anxiety, Sleep wake disorders, Coronavirus

ABSTRACT

Introduction: Considering the importance of maintaining the mental health of healthcare personnel, particularly medical students, who are considered the future backbone of the medical staff and are in contact with Coronavirus Disease 2019 (COVID-19) patients, this study aims to assess the mental health status of medical students at Mashhad University.

Materials and Methods: A descriptive, cross-sectional, prospective investigation was conducted during the 2022 COVID-19 pandemic, involving 390 medical students at Mashhad University. The General Health Questionnaire-28 (GHQ-28) measured the prevalence of depression, anxiety, sleep disorders, and social interaction issues. The Coronavirus anxiety scale (CAS) was developed to determine the level of anxiety caused by the coronavirus outbreak.

Results: Unvaccinated students had significantly higher CAS scores for psychological dimension (P=0.005) and total scores (P=0.04). Vaccinated participants had lower mean scores on the GHQ-28 depression subscale (P=0.03). Those with previous COVID-19 infection, underlying diseases, or hospitalization for COVID-19 had lower average GHQ-28 scores (P<0.05) but higher CAS scores (P<0.05). Those who had experienced a relative's death owing to COVID-19 had significantly higher CAS scores compared to others (P<0.05). Individuals with children scored significantly higher on the subscales of general health, social disorder, and depression, as well as the total GHQ-28 score (P<0.05).

Conclusion: Our study found that factors such as a lack of vaccination, prior COVID-19 infection, loss of a relative due to COVID-19, the presence of underlying health conditions, and hospitalization due to COVID-19 are associated with poor public health and increased anxiety among medical students.

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Cervical Bacterial Colonization in Women with Preterm Premature Rupture of Membrane and Pregnancy Outcomes: A Cohort Study

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ARTICLEINFO

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Keywords:
Bacterial colonization, Genital tract, Preterm premature rupture of membrane

ABSTRACT

Introduction: One of the most important etiologies in preterm premature rupture of membranes (PPROM) is cervical bacterial colonization. This study evaluated cervical bacterial colonization in women with PPROM and the pregnancy outcomes.

Materials and Methods: In this cohort study, 200 pregnant women with PPROM at 27-37 wk of gestation who were admitted in an academic hospital of Mashhad University of Medical Sciences from March 2015 to July 2016 were studied. Samples were obtained from endocervical canal for detection of routine bacteria and Gram staining. Also, we obtained one blood culture from neonates. Maternal endocervical culture, chorioamnionitis, neonatal intensive care unit admission, neonatal positive blood culture, neonatal sepsis, and mortality were documented.

Results: Most common isolated microorganism of endocervical culture were Escherichia coli (24.2%), Coagulase negative Staphylococci (27.2%), Enterococcus and candida each one (11.7%). The prevalence of GBS was only 2.2%. Simultaneous positive blood cultures were seen in 3% of neonates. Among them, Gram-negative bacilli accounted for (66.6%), while Gram-positive cocci and candida made up only (16.7%). Endocervical colonization was associated with a higher admission rate (p=0.004), but there was no significant correlation between endocervical colonization and chorioamnionitis, positive blood culture and neonatal mortality rate.

Conclusion: With regard to low GBS colonization rate, appropriate antibiotic regimens should be considered in PPROM cases according to the most prevalent microorganisms of endocervical bacterial colonization. Maybe cervical bacterial colonization had some effects on neonatal outcomes. There was no significant association between endocervical bacterial colonization and chorioamnionitis, positive neonatal blood culture and neonatal mortality.

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Chronic Meningitis

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Keywords:
Meningitis, Chronic, Etiology, Diagnosis

ABSTRACT

Meningitis can be categorized based on the duration of illness. Chronic meningitis is a long-lasting inflammatory condition affecting the meninges, typically marked by symptoms lasting over four weeks. It is often caused by infectious agents, autoimmune diseases, or unusual neoplastic processes, but despite comprehensive diagnostic evaluations, an etiologic diagnosis may be unknown in about one-third of all patients. Sometimes an epidemiological or historical background can help to identify the etiology. Common known causes include bacterial infections (such as *Mycobacterium tuberculosis*, *Brucella* species), fungal infections (like *Cryptococcus*), and viruses (for example chronic enteroviral meningitis in patients with hypogammaglobulinemia). The clinical presentations are varied and patients usually present with headaches, fever, and neurological issues, making early diagnosis challenging. Essential diagnostic methods include imaging studies and analysis of cerebrospinal fluid, but atypical presentations can complicate the process. Treatment approaches depend on the underlying cause and may include antimicrobial drugs, corticosteroids, and management of symptoms. A thorough understanding of chronic complex nature of meningitis is vital for effective treatment and improved patient outcomes. Ongoing research is focused on developing new diagnostic methods and treatments to enhance early detection and personalized care.

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Community-acquired Bacterial Meningitis: Diagnostic Challenges

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Keywords:
Community-acquired infection, Bacterial meningitis, Challenges

ABSTRACT

Community-acquired bacterial meningitis is a critical infection with high morbidity and mortality, particularly in low- and middle-income regions where it imposes a substantial public health burden. While incidence has declined in high-income countries, bacterial meningitis remains a significant concern in resource-limited settings. In Iran, for example, the disease accounted for 58,229 disability-adjusted life years (DALYs) in 2016, though this figure may underestimate its impact. The true burden of bacterial meningitis in Iran remains challenging to estimate accurately due to numerous limitations in study design and reporting. Many Iranian studies fail to distinguish between community-acquired and healthcare-associated infections, often resulting in the inclusion of hospital-associated bacterial species and inflated antimicrobial resistance rates. This lack of clarity in categorization skews findings, making an exact estimation of the burden of illness nearly impossible. Furthermore, bacterial meningitis is significantly underreported and underestimated, raising serious concerns regarding surveillance efforts. These challenges emphasize the critical need for improved diagnostic standards and reporting protocols to accurately assess and address bacterial meningitis. Enhanced surveillance could provide essential data, enabling public health authorities to optimize healthcare delivery and develop cost-effective strategies for the diagnosis, management, and prevention of this disease.

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Comparative Synergistic Effects of Thymol with Ceftazidime and Cefotaxime against *Acinetobacter baumannii*

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ARTICLEINFO

Orals

Key words:
Acinetobacter baumannii, Thymol, Cefotaxime, Ceftazidime, Synergistic

ABSTRACT

Introduction: This study aimed to compare the antimicrobial effects of thymol/ceftazidime and thymol/cefotaxime on *A. baumannii* bacteria.
Material and Methods: Antimicrobial effects of thymol/ceftazidime and thymol/cefotaxime were performed first individually and then combined on *A. baumannii* ATCC19606 by the MIC-MBC method. Therefore, the antimicrobial effects of the compounds that had a synergistic impact were performed on eighteen clinical strains using the MIC-MBC method. The identification of chemical bonds, functional groups, and molecular interactions of the mentioned compounds was investigated using an FTIR device. Checkered method, biofilm inhibition on *A. baumannii* ATCC 19606, investigation of cytotoxicity on red blood cells (RBCs) by hemolysis method and human skin fibroblast cells (Ffk) by MTT method were performed. Thymol/ceftazidime and thymol/cefotaxime had synergistic effects. Finally, the results of the tests were compared between the two compounds.
Results: The results of this study showed that the antimicrobial effects of the thymol/ceftazidime (256/4 µg/ml) were better than the thymol/cefotaxime (512/128 µg/ml) in both clinical and ATCC strains. In the examination with the FTIR device, both compounds had bonds of OH carbohydrates proteins, polyphenols, C=O Amide I band, C-O-Cpolysaccharide, C-Namide III band, but one band named C=C conjugated, C≡C in both compounds showed the connection between thymol with ceftazidime and cefotaxime. The biofilm inhibition effects of thymol/ceftazidime (24.41%) were better than thymol/cefotaxime (39.28%) on *A. baumannii* ATCC 19606. The bacterial killing time curve of the thymol/ceftazidime at a lower concentration and time was better than the thymol/cefotaxime. Cytotoxicity of synergistic compounds on RBCs and human Ffk cells was not different and was lower than that of Triton X-100.
Conclusion: Considering the antibiotic resistance of ceftazidime and cefotaxime in the treatment of diseases caused by *A. baumannii* bacteria, the thymol/ceftazidime in this study showed better antimicrobial, anti-biofilm, and bacterial killing time effects than the thymol/cefotaxime. This combination can be used as a new drug in patients after further studies.

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Comparing The Effectiveness of The Intervention Based on Skills Training in Improving the Quality of Microbiology in Medical Diagnosis Laboratories of Mashhad University of Medical Sciences

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Keywords:
Medical microbiology, Skills training, Quality assurance, Antimicrobial resistance

ABSTRACT

Clinical microbiologists can be called lifelong learners due to the need to discover and control new pathogens (e.g. COVID-19), emerging infectious diseases, and increasing antimicrobial resistance. Since all the processes of the microbiology department of a medical diagnostic laboratory are manual the accuracy of results is very dependent on the expertise and precision of the staff, there is a need for special attention in the field of quality control. Thus, here we aimed to investigate the effectiveness of the intervention, based on the training of the microbiology staff in Mashhad University of Medical Sciences hospital labs. The present study consists of three main steps included, Pre-analytic intervention, (including two basic steps: a. revising the sampling and sample transferring errors; b. communication with hospital infection control officials regarding pre-analytic errors, Analytic intervention, (including a review of previous reports of hospital condition assessment, organizational training courses face to face, webinars, and social media based on staff needs), and Post-analytic intervention. Comparing the results of the pre-and post-intervention indicated that training significantly reduces non-compliance, and improves the implementation level of the quality assurance program and subsequently the services provided. Since test results play a key role in diagnosis and treatment, the existence of a quality control mechanism is very important, and the test results will become reliable only if there are no laboratory errors in the process of the test.

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Comparison of Distribution of Bacteria and Antibiotic Resistance in Bloodstream Infections among Pediatric and Adult Patients at A Teaching Hospital in Iran, Shiraz

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ARTICLEINFO

Orals

Keywords:
Bloodstream infections, Drug-resistant organisms, Pediatric patients, Adult patients, Methicillin resistance Staphylococcus aureus, Extended-spectrum beta-lactamase VRE

ABSTRACT

Introduction: Bloodstream infections (BSIs) represent a significant source of morbidity and mortality for patients across all age groups. This study aimed to investigate the causative agents of BSIs in pediatric and adult patients to determine the prevalence of drug-resistant organisms.

Materials and Methods: This retrospective cross-sectional study analyzed blood cultures sent to the Professor Alborzi Clinical Microbiology Research Center in Nemazee Hospital from 2010 to 2024. Antibiotic susceptibility testing was performed using the Kirby Bauer Disk Diffusion method with CLSI guidelines. Methicillin resistance *Staphylococcus aureus* (MRSA), was identified using cefoxitin disc, and the presence of Extended-spectrum beta-lactamase (ESBL) was confirmed via the CLSI double disc method.

Results: Over 14 years, we analyzed 3709 and 4153 blood culture specimens from pediatric and adult patients suspected of BSIs, and 1773 specimens that did not provide information about the patient's age were excluded. The most common pathogens identified in pediatric wards were *Stenotrophomonas maltophilia* (Pma) (28%), *Pseudomonas spp.* (10%), *Enterococcus spp.* (7%), and *Enterobacter spp.* (6%) and in adult wards, Pma (16%), *Escherichia coli* (15%), *Staphylococcus aureus* (12%), and *Enterococcus spp.* (9%) were the most frequently isolated pathogens. This study revealed high rates of antibiotic resistance in both pediatric and adult wards. MRSA was prevalent in 53 % of pediatric and 44 % of adult wards. (P-value=0.05) Vancomycin-resistant Enterococcus sp. was observed in 70 % of pediatric and 66 % of adults. (P-value=0.01) ESBL producers in Enterobacteriaceae were (71 %) in pediatrics compared to (61 %) in adults. (P-value=0.04) Carbapenem resistance (CR) was also prominent in Acinetobacter spp., with 63 % resistance in pediatric and an alarming 93 % in adults. (P-value=0.12) Similarly, *Klebsiella pneumoniae* showed 43 % resistance in pediatrics and 67 % in adults. (P-value=0.13) Moreover, the prevalence of CR Pseudomonas spp. was substantial, with 28 % resistance in pediatric and 31% in adult wards. (P-value=0.03)

Conclusion: This information suggests that data on drug resistance monitoring in pediatric and adult patients should be analyzed separately and shared with physicians to guide their selection of empirical antibiotic regimens in different clinical contexts.

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COVID-19 and Hypocalcemia

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Keywords:
COVID-19, MIS-C (Multisystem inflammatory syndrome), Hypocalcemia, Vitamin D

ABSTRACT

At the end of 2019, a new type of corona virus was identified, which quickly spread worldwide. The World Health Organization named the disease caused by this virus COVID-19. In the spring of 2020, in England, there were reports of clinical manifestations similar to incomplete Kawasaki disease and toxic shock syndrome following corona infection in children, which was named Multisystem Inflammatory Syndrome in children or MIS-C. MIS-C has several criteria and is divided into mild, moderate and severe. According to the CDC in 2023, the revised criteria include age less than 21 years, fever 38 º C and laboratory evidence of inflammation (CRP greater than 3 mg/dL), involvement of more than 2 systems (shock, cardiovascular, hematological, digestive, dermatological), severe disease requiring hospitalization, evidence of COVID-19 infection, and lack of a more likely differential diagnosis. According to the studies, vitamin D deficiency and hypocalcemia during this time have a negative effect on the prognosis of the disease.

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Detection of Colistin Resistance Genes (mcr-1 and mcr-2) among Carbapenemase-Producing Acinetobacter baumannii Isolates from Hospitalized Patients, Shiraz, Iran

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Orals

Keywords:
Acinetobacter baumannii,
Carbapenem-resistance,
Colistin-resistance,
Multi-drug resistance

ABSTRACT

Introduction: *Acinetobacter baumannii* is a gram-negative pathogen responsible for a wide range of diseases. In this study we aimed to investigate colistin-resistance rate and detect colistin-resistance and some important carbapenemase genes among *A. baumannii* MDR isolates in Shiraz, Iran.

Materials and Methods: This study has done on *A. baumannii* isolates collected from various samples from hospitalized patients admitted to Namazi Hospital in 2023. The antibiotic susceptibility testing was done using Kirby-Bauer disc diffusion method. The minimum inhibitory concentration (MIC) for colistin was measured by micro broth dilution method. MIC was also measured for meropenem, and modified carbapenem inactivation method (mCIM) was performed for meropenem-resistant isolates to detect carbapenemase-producing isolates phenotypically. Colistin-resistant and carbapenemase-producing isolates were tested to detect mcr and carbapenemase genes respectively by PCR.

Results: A total of 173 isolates were confirmed as *A. baumannii* phenotypically and biochemically. The mean age of the patients was 50.1 ± 21.5 years and 65.3% of the patients were males. The highest frequency of isolates was related to blood samples that was 29.1% (51 isolates) followed by sputum and wound which were 18.9% (33 isolates) and 14.9% (26 isolates) respectively. The resistance rate against meropenem was 95.4% (165 isolates); 11 isolates (6.4%) had MIC128 µg/ml. MIC90 and MIC50 for meropenem were 128 µg/ml and 64 µg/ml respectively. The results of mCIM were positive for 58 isolates (33.5%); also, 56.8% (33 of 58 isolates) of mCIM-positive isolates were resistant to colistin. All isolates were MDR. Tracking carbapenemase genes including blaNDM, blaKPC, blaIMP, blaVIM, blaSIM, and blaGIM was done for mCIM-positive isolates. The highest frequency was 19.0% (11/58) for blaVIM, followed by blaKPC (9/58, 15.5%), blaSIM (5/58, 8.6%), blaIMP (3/58, 5.2%) and blaNDM (2/58, 3.4%). blaGIM was not detected in this study. Also, none of mcr-1 and mcr-2 genes were detected among colistin-resistant isolates.

Conclusions: Colistin is recognized as the last resort for infections caused by MDR strains of A. baumannii. In this study, resistance to colistin was 39.9%. According to the findings, it seems that the variety of genes responsible for the production of carbapenemase enzyme is high among A. baumannii strains.

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Emerging and Re-emerging Infectious Diseases: Significance and Challenges

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Keywords:
Emerging, Re-emerging, Significance, Challenges

ABSTRACT

Emerging and re-emerging infectious diseases are among the significant causes of morbidity and mortality worldwide. They represent a complex and urgent challenge for global health. In the last decades, several infectious pathogens have emerged or re-emerged due to host-pathogen interactions, climate and environmental changes. These diseases are often caused by bacteria (such as drug resistant tuberculosis, diphtheria, pertussis), viruses (like SARS-COV2, MERS, Dengue, measles, monkeypox, viral hepatitis), and parasites including drug resistant malaria and HIV. Recently, among the most notable emerging and re-emerging infectious diseases COVID-19 that caused by SARS-COV2, highlighted the impact of pandemics on global health. Another problem is the globalization of drug-resistant bacterial infections. One of the most important challenges in controlling these conditions is the rapid spread all around the different populations. In addition, public misinformation and low health literacy regarding vaccines and treatments and irrational and arbitrary use of antibiotics, fight efforts to manage outbreaks. So, comprehensive strategies that improve surveillance and health literacy, promote collaboration and develop healthcare infrastructures are essential to mitigate their effects and protect public health.

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Epidemiology, Predictive Modeling, and Clinical Implications of Multidrug-Resistant Gram-Negative Gut Colonization in Pediatric Oncology: A Prospective Cohort Study

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Keywords:
Carbapenemase-producing carbapenem-resistant Enterobacteriaceae, Colonization, Gram-negative bacteria, Extended-spectrum beta-lactamase-producing Enterobacteriaceae

ABSTRACT

Introduction: This study examines the fecal colonization rate and antibiotic susceptibility of CP-CRE and ESBL-producing GNB in newly diagnosed pediatric cancer patients. It explores complications such as neutropenic enterocolitis, bloodstream infections, and mortality. The research also aims to develop predictive scoring models for subsequent infections in colonized patients.

Materials and Methods: This prospective cohort study was conducted at a referral teaching hospital in Shiraz, Iran. Fecal samples were collected at three-time points: within 48-72 hours of hospitalization, at the end of the first chemotherapy session, and during the next admissions. Univariate and multivariable logistic regression analyses were conducted to identify risk factors for hospital-acquired colonization, and a risk predictive scoring model was developed based on the significant risk factors identified.

Results: The study found that a majority of patients (70.4%) had community-acquired (CA) colonization with GNB, while a smaller proportion (9.88%) had hospital-acquired (HA) colonization. *E. coli* and *Klebsiella* species were the most commonly identified pathogens. In vitro susceptibility testing showed that colistin, amikacin, and carbapenems had the highest activity against the isolates. ESBL-producing GNB was detected in 58% of samples, and CP-CRE was found in 14.6% of samples. While 21.05% of patients with CA colonization developed subsequent bloodstream infections or neutropenic enterocolitis, only 12.5% of those with HA colonization experienced these complications. Older age, female sex, leukemia, cancer relapse, antibiotic exposure, and febrile neutropenia episodes were identified as risk factors for hospital-acquired colonization.

Conclusions: Colonization with CA GNB was associated with lower survival probabilities at 12 months and *K. pneumoniae spp*. and CP-CRE colonization were found to be associated with an increased risk of typhlitis and BSI. Typhlitis and BSIs can be predicted and potentially prevented using models that score factors like *K. pneumoniae spp*. and CP-CRE colonization, sex, age, underlying malignancy, and relapse status.

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Evaluation of Antibacterial Activity of Five Biocides and the Synergistic Effect of Biocide/EDTA Combinations on Biofilm-producing and Non-producing Stenotrophomonas maltophilia Strains Isolated from Clinical Specimens

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ARTICLEINFO

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Keywords:
Stenotrophomonas maltophilia, Biocide-resistance, Antibiotic resistance, Nosocomial infection, Biofilm

ABSTRACT

Introduction: The overuse of biocides in healthcare-facilities poses risk for emergence and spread of antibiotic resistance among nosocomial pathogens. Hospital-acquired infections due to *S. maltophilia* have been increased in the recent years and with its various resistance mechanisms contribute to patient morbidity and mortality in hospitals.

Materials and Methods: The current study aimed to evaluate the susceptibility of biofilm-producing and non-producing *S. maltophilia* clinical isolates to five commonly used hospital biocides, alone and in combination with EDTA to examine the synergistic effect of combining EDTA on the bactericidal activity of them by microbroth dilution method, as well as the frequency of efflux genes encoding resistance to biocides among isolates. This study also intended to assess the effect of exposure of *S. maltophilia* isolates to sub-inhibitory concentrations of sodium hypochlorite upon the antimicrobial susceptibility patterns.

Results: Based on minimum inhibitory and bactericidal concentrations of biocides sodium hypochlorite 5% (w/v) and ethyl alcohol 70% (v/v) were the strongest and weakest biocides against *S. maltophilia* isolates, respectively. The combination of EDTA with biocides significantly increased the effectiveness of the studied biocides. Exposure to subinhibitory concentration of sodium hypochlorite showed a significant change in the susceptibility of isolates towards ceftazidime ($p = 0.019$), ticarcillin/clavulanate ($p = 0.009$), and chloramphenicol ($p = 0.028$). As well as among the isolates examined, 94 (95%) were able to produce biofilm. The frequency of sugE1 resistance genes was found in 90.7% of our clinical *S. maltophilia* isolates. None of the isolates carried qacE and qacEΔ1 gene.

Conclusion: The current study recommended that using the mixture of biocides with EDTA can be effective in reducing nosocomial infections. Also, this study demonstrated that exposure to sub-inhibitory concentrations of sodium hypochlorite leads to reduced antibiotic susceptibility and development of multidrug-resistant *S. maltophilia* strains.

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Experimental Differences between Acute Rheumatic Fever (ARF) and Post-Streptococcal Reactive Arthritis (PSRA) in Children

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ARTICLEINFO

Orals

Keywords:
Post-Streptococcal reactive arthritis, Acute rheumatic fever (ARF), Children

ABSTRACT

Acute Rheumatic Fever (ARF) and Post- Streptococcal Reactive Arthritis (PSRA) may follow infection with either group A or group G streptococcus. This incidence was twice that for ARF during the same period. Age of onset: ARF usually occurs in children aged 5 to 15 years, while PSRA is more commonly seen in older children and adolescents. It is typically oligo-articular, affecting lower-extremity joints, and mild symptoms can persist for months. PSRA differs from ARF, which typically manifests with painful migratory polyarthritis of brief duration. Duration of symptoms: Symptoms in ARF are more prolonged and persistent, while in PSRA, the symptoms are shorter and tend to resolve more quickly. Because valvular lesions have occasionally been documented by echocardiography after the acute illness, some clinicians consider PSRA to be an incomplete form of ARF. Inflammatory markers: In ARF, inflammatory markers (such as CRP and ESR) are significantly elevated, whereas in PSRA, the elevation may be less pronounced and temporary. Certain HLA-DRB1 types may predispose children to development of either PSRA (HLA-DRB1*01) or ARF (HLA-DRB1*16). NSAIDs are the principal drugs used in treatment. Antimicrobial prophylaxis prevents recurrences, and possibly subsequent cardiac disease. The American Heart Academy (AHA) has suggested prophylaxis for one year, if carditis is not detected then, prophylaxis is discontinued.

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Fever and Lymphadenopathy in Children: A Focus on Autoimmune and Autoinflammatory Diseases

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ARTICLEINFO

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Keywords:
Fever, Lymphadenopathy, Autoimmune disease, Autoinflammatory syndromes

ABSTRACT

Fever and lymphadenopathy are common clinical presentations in pediatric patients, often indicating an underlying condition that requires careful evaluation. A comprehensive clinical assessment, including a detailed medical history, thorough physical examination, and targeted laboratory tests, is essential for identifying the causes of these symptoms in children. As a pediatrician, it is crucial to recognize the wide range of potential infectious and non-infectious causes to facilitate accurate diagnosis and management. The activation of the immune system and chronic inflammation plays central roles in the development of lymphadenopathy associated with various autoimmune and autoinflammatory diseases. Notably, several autoimmune diseases, such as Kawasaki Disease, Systemic Juvenile Idiopathic Arthritis (sJIA), Systemic Lupus Erythematosus (SLE), and systemic vasculitis, including Polyarteritis Nodosa and Granulomatosis with Polyangiitis, can present with these symptoms. Additionally, various autoinflammatory syndromes can lead to similar presentations. These include Familial Mediterranean Fever (FMF), Hyper-IgD Syndrome (HIDS), Tumor Necrosis Factor Receptor-Associated Periodic Syndrome (TRAPS), and Cryopyrin-Associated Periodic Syndromes (CAPS), which consist of Muckle-Wells Syndrome and Familial Cold Autoinflammatory Syndrome. Rheumatic diseases are often overlooked as potential causes of fever and lymphadenopathy. This neglect can lead to significant diagnostic delays and may result in unnecessary medical procedures for many patients. To ensure an accurate diagnosis, it is essential to consider key factors such as the patient's age, accompanying symptoms, and whether the fever is persistent or periodic. Addressing these factors is vital for effective patient care. By thoroughly recognizing these conditions, healthcare professionals can support timely diagnoses and comprehensive treatment, ultimately leading to better outcomes for pediatric patients. Clinicians must remain vigilant and informed about these potential causes to ensure effective care.

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Green Synthesis and Characterization of Saponin Nanoparticles on Acinetobacter Isolates from Wound Infections

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Keywords:
Green synthesis, Saponin nanoparticles, Acinetobacter baumannii, Antimicrobial activity, Biofilm inhibition, Wound infections, Nanotechnology

ABSTRACT

Introduction: *Acinetobacter baumannii*, a prominent cause of wound infections, poses significant therapeutic challenges due to its multidrug resistance and biofilm-forming abilities. This study synthesised saponin-based nanoparticles using a green approach and tested for their antimicrobial and anti-biofilm effects on *A. baumannii* isolates.

Materials and Methods: Saponin nanoparticles were synthesized through a green synthesis process, employing plant-derived saponins and environmentally friendly methods. The nanoparticles were characterized using scanning electron microscopy (SEM) for morphological evaluation, which revealed spherical nanoparticles with an average size of approximately 100-150 nm. Dynamic light scattering (DLS) confirmed particle size distribution. The broth microdilution method evaluated the antimicrobial efficacy, revealing minimum inhibitory concentrations (MIC) between 8-64 µg/mL and minimum bactericidal concentrations (MBC) ranging from 16-128 µg/mL. The anti-biofilm activity was quantified using the crystal violet assay, where biofilm inhibition reached up to 75% at 64 µg/mL concentration.

Results: The green-synthesized saponin nanoparticles demonstrated potent antimicrobial activity, with MIC values ranging between 8 and 64 µg/mL and MBC values between 16 and 128 µg/mL, depending on the isolate. Biofilm formation was significantly reduced, with the highest concentration of saponin nanoparticles (64 µg/mL) inhibiting biofilm by 75% compared to untreated controls (p0.05).

Conclusion: The results show that green-synthesized saponin nanoparticles exhibit strong antimicrobial and anti-biofilm effects against *A. baumannii* isolates from wound infections. These nanoparticles offer promising potential as an alternative therapeutic agent in combating multidrug-resistant *Acinetobacter* infections, particularly those involving biofilm formation.

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High Incidence of Pneumocystis Jirovecii Pneumonia in Pediatric Inpatients, The Northeast of Iran

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Keywords:
Pneumocystis jirovecii, Pediatrics, Real-time PCR, Giemsa, Pneumonia

ABSTRACT

Introduction: Pneumocystosis, an opportunistic infection caused by the *Pneumocystis jirovecii*, is a significant contributor to hospital infections in children with underlying health conditions or weakened immune systems, and it can be fatal in these patients. The symptoms of pneumocystosis often resemble those of other infectious lung diseases, such as tuberculosis, making accurate and differential diagnosis essential for initiating appropriate treatment. Therefore, the aim of this study is to utilize the polymerase chain reaction (PCR) molecular method, specifically Real-time PCR, to identify *P. jirovecii* in vulnerable children exhibiting pulmonary symptoms, and to compare the results with those obtained from Giemsa staining.

Materials and Methods: In this study, 180 bronchoalveolar lavage (BAL) specimens were collected from the lungs of children admitted to pediatric hospitals. Additionally, the Giemsa slides were created from the collected specimens. Following the protocol of the AmpliSens® kit, DNA was extracted from the samples, and the real-time PCR method was employed to detect P. jirovecii using the AmpliSens *P. jirovecii* (carinii)-FRT PCR kit.

Results: Out of the 180 specimens analyzed, 34 tested positive and 8 were deemed suspicious for the presence of *P. jirovecii*. Giemsa staining identified this organism in only 2 cases (5.88%) of those confirmed positive by the real-time PCR method. Additionally, the study found no correlation between the positive real-time PCR results and the patient's gender, disease outcome, or underlying health issues.

Conclusion: The findings of this study indicate that pneumocystosis has a relatively high prevalence among vulnerable children exhibiting pulmonary symptoms. Among those with underlying health conditions, children with neutropenia demonstrated the highest rate of P. jirovecii infection. Furthermore, the real-time PCR method is recognized as a valuable technique with a strong positive predictive value for the accurate identification of the *P. jirovecii* fungal agent in children.

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Identification of Integrons and ESBL Genes in Shigella Sonnei Isolates in Shiraz, Southwestern Iran

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ARTICLEINFO

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Keywords:
Drug resistance, Integron, Shigella sonnei, Shigellosis

ABSTRACT

Introduction: *Shigella sonnei* is the main species that causes Shigellosis in developed countries. It is the second common Shigella species in developing countries whose increasingly growing antibiotic resistance has posed a serious threat to the health system. The present study was designed to identify integrons and genetic factors associated with the probable antibiotic resistance in *Shigella sonnei* isolates in Shiraz, the largest city in southwest Iran.

Materials and Methods: In this cross-sectional study, 50 *S. sonnei* were isolated from 397 stool specimens collected from patients attending Dastgheib Hospital in Shiraz, Iran. Antibiotic susceptibility testing was done using the Kirby-Bauer disc diffusion method. Bacterial DNA was extracted by boiling, and PCR test was performed. Statistical analysis of data was done by SPSS.25 software.

Results: The frequency of extended-spectrum β-lactamase (ESBL) phenotype was 64%. Multi-drug resistance was observed in all isolates. The highest rates of antibiotic resistance were observed for cefotaxime (100%), ceftriaxone (100%), and co-trimoxazole (100%), and the lowest rates of antibiotic resistance were observed against ofloxacin (8%), gentamicin (8%), and amikacin (10%). Class II integron had the highest frequency among the studied genetic elements (90%). CTXM gene came in the next place regarding the frequency rate (70%). There was a statistically significant relationship between class II integron and the incidence of ESBL phenotype. The presence of class II integron was accompanied by greater antibiotic sensitivity to ciprofloxacin ($p = 0.042$).

Conclusion: The findings of this study showed that the frequency of multi-drug resistance was 100% among the studied *S. sonnei* isolates. In addition, the frequency of the drug-resistance-related genes was significantly high. This doubles the importance of infection control to cut the transmission chain of antibiotic-resistant strains.

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Impact of the COVID-19 Pandemic on Blood Culture Trends and Pathogen Distribution: A Retrospective Analysis from Kamiab Hospital (2019–2023)

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ARTICLEINFO

Orals

Keywords:
COVID-19, blood culture, pathogen distribution, Acinetobacter, Staphylococcus epidermidis, Infection trends

ABSTRACT

Introduction: This retrospective analysis evaluates the impact of the COVID-19 pandemic on blood culture trends at Kamiab Hospital from 2019 to 2023.

Materials and Methods: Data spanning from pre-pandemic to post-pandemic years were assessed to identify shifts in blood culture practices, positivity rates, and the types of isolated organisms.

Results: The analysis showed distinct differences in the total number of blood cultures performed and their positivity rates between pandemic and non-pandemic periods. During the height of the pandemic (2020–2021), both blood culture requests and positivity rates decreased significantly, possibly due to altered healthcare priorities and limited hospital admissions for non-COVID cases. Comparatively, as the pandemic impact lessened by 2022, there was a gradual increase in both blood culture frequency and positive detection rates. Key yearly findings include: - **2019 (Pre-COVID)**: 580 blood cultures, 198 positive cases (positivity rate ~34.1%). - **2020 (COVID onset)**: 421 cultures, 109 positive cases (positivity rate ~25.9%). - **2021 (COVID peak)**: 168 cultures, 41 positive cases (positivity rate ~24.4%). - **2022 (Post-COVID)**: 196 cultures, 48 positive cases (positivity rate ~24.5%). - **2023 (Post-COVID recovery)**: 291 cultures, 62 positive cases (positivity rate ~21.3%). Throughout the study, ***Acinetobacter*** and ***Staphylococcus epidermidis*** were the predominant organisms isolated, suggesting stable pathogenic patterns despite fluctuating blood culture rates.

Conclusion: This data highlights the COVID-19 pandemic's indirect impact on blood culture practices, as healthcare systems adapted to prioritize critical resources for COVID-19 management. It underscores the importance of understanding healthcare trends in infection monitoring and response strategies, particularly during global health crises.

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Importance of Fungal Infections among Cancer Patients

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Keywords:
Fungal infections, Cancer, *Candida*, *Aspergillus*

ABSTRACT

Fungal infections (FIs) have emerged as a significant concern among cancer patients, particularly following the introduction of effective antibacterial agents and the prolonged survival of immunocompromised individuals. Initially, Candida species were the predominant cause of these infections; however, there has been a notable increase in infections caused by Aspergillus species in recent years. Most FI occur in patients with hematologic malignancies, with fungi responsible for 40% to 50% of fatal infections. While approximately 10% of lymphoma patients experience FIs, they are less common in those with metastatic carcinoma. Alarmingly, systemic FIs are increasingly observed in patients undergoing initial chemotherapy for acute leukemia and lymphoma, a shift from previous patterns where such infections primarily affected patients with advanced disease. FIs in cancer patients can be categorized into pathogenic fungi (e.g., *Cryptococcus neoformans*, *Histoplasma capsulatum*) and opportunistic fungi (e.g., *Candida* spp., *Aspergillus spp*.). Fungemia, primarily caused by *Candida* species, is uncommon, but the spectrum of *Candida* pathogens has expanded beyond *C. albicans* to include species like *C. tropicalis* and *C. glabrata*. The rise in FIs is attributed to several factors, including the extensive use of broad-spectrum antibiotics, which can disrupt the balance of normal flora and promote fungal overgrowth. Additionally, the use of adrenal corticosteroids and prolonged neutropenia further predispose patients to these infections. Timely diagnosis requires a high index of suspicion and may involve invasive procedures. Fortunately, advancements in noninvasive diagnostic techniques and improved treatment options are emerging. Antifungal therapies include polyenes (e.g., amphotericin B), echinocandins (e.g., caspofungin), and azoles (e.g., voriconazole, posaconazole), each with varying mechanisms of action and spectra of activity. While these treatments have improved outcomes, the emergence of resistant fungal pathogens remains a concern, necessitating ongoing vigilance and adaptation in management strategies.

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Infections Associated with the Care of Patients with Congenital Heart Disease

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ARTICLEINFO

Orals

Keywords:
CHD, Infection, Surgery

ABSTRACT

Introduction: Congenital heart disease (CHD), the most common congenital anomaly, is a major global health concern. This study investigates infections associated with the care of patients with CHD.
Materials and Methods: Articles published between 2014 and 2024 in Medline (PubMed), EMBASE, Web of Science, and SCOPUS focusing on infections associated with the care of patients with CHD were included.
Results: CHD occurs in approximately 0.6–1.3% of live births globally, reaching up to 0.9% in Asia, with over half requiring surgery within their first year. Clinical symptoms include dyspnea, palpitations, cyanosis, and low oxygen saturation. Although most cases are diagnosed within the first month, CHD remains a significant cause of neonatal mortality. Postoperative infections affect 15–30% of CHD surgeries, primarily due to bacterial and occasionally fungal pathogens, resulting in extended ICU stays, higher costs, and increased mortality risk. Identified risk factors include young age, ventilator use, and longer cardiopulmonary bypass duration, with infections commonly presenting as catheter-associated bloodstream infections, sepsis, pneumonia, and surgical site infections.
Conclusion: CHD is a prevalent global condition, often requiring early surgery and posing infection risks that impact infant mortality and healthcare costs. Preventive strategies, including stringent disinfection protocols and targeted antibiotic use, are essential for reducing infection rates, hospitalization duration, and antibiotic resistance.

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Investigating The Effect of Phage Cocktail against Antibiotic Resistant Pseudomonas Aeruginosa

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Keywords:
Bacteriophage, Pseudomonas aeruginosa, Phage therapy

ABSTRACT

Introduction: Nowadays, with the increasing resistance of pathogenic bacteria to all kinds of antibiotics and the spread of strains resistant to several drugs, it is very necessary to find new ways to deal with these strains. One of these ways to deal with antibiotic resistance is the use of bacteriophages, which specifically and without harming the cells of the host's body destroy the bacteria that cause infection. Among the types of bacteria, Pseudomonas aeruginosa strains resistant to antibiotics have shown high statistics in causing burns, hospital infections and deaths caused by them. Therefore, the main goal of this study was to identify, isolate and enrich lytic bacteriophage against P. aeruginosa from hospital wastewater.

Materials and Methods: P. aeruginosa ATCC 27853 strain was obtained from Pooyan Azma Company and RTCC1474 strain was obtained from Microbial Bank of Islamic Azad University, Karaj Branch and confirmed by biochemical tests. Also, the antibiotic sensitivity of the strains was evaluated using the disc diffusion method according to the CLSI protocol. Also, the sample of the wastewater of Ghaem Hospital, Karaj, Iran, was used for the isolation of bacteriophages. Isolation of bacteriophages was done by centrifuging the wastewater sample and filtering its supernatant using 0.45 and 0.22 micrometer filters. To confirm the presence of bacteriophages, two-layer agar method was used. Bacteriophage specificity was also determined by spot method. Finally, transmission electron microscopy was used to examine the structure and morphology of bacteriophages.

Results: two specific phages were isolated for P. aeruginosa strains ATCC27853 and RTCC1474. The appearance of plaques in the two-layer culture is a sign of the presence of lytic bacteriophage and the creation of a clear halo in the spotting method for the purpose of phages specificity. Also, the transmission electron microscope images revealed that these phages are spherical, polygonal without tails, and the sizes are about 50 and 100 nm, which are shown to be more similar to the Tectoviridae and Cystoviridae family when compared with other studies.

Conclusion: The use of lytic bacteriophages isolated against resistant strains of P. aeruginosa can be a safe way to eliminate Pseudomonas infections.

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Investigating The Prevalence of Chlamydia Trachomatis and Ureaplasma Urealyticum Bacterial Infections in Infertile Couples and Their Typing by Multi-Locus Sequence Typing Method

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ARTICLEINFO

Orals

Keywords:
Infertility, Chlamydia trachomatis, Ureaplasma urealyticum, Multilocus sequence typing

ABSTRACT

Introduction: Infertility is one of the major issues nowadays, causing numerous psychological, emotional, and financial problems for couples worldwide, especially in Iran. In women, genetic issues such as problems with ovaries, uterus, fallopian tubes, and hormonal imbalances can contribute to infertility. In men, problems with sperm production, sperm transport, structural and motility issues of sperm, and hormonal problems can also be involved in infertility. Additionally, infectious factors like bacterial infections can play a significant role in infertility. Objectives: Considering that no study has been conducted so far on the prevalence and molecular types of bacteria transmitted through sexual contact using MLST Typing in infertile couples in Iran, this study aims to investigate this matter.

Materials and Methods: In this study, 268 samples (134 couples) of vaginal swabs, uterine cervix, vaginal secretions, as well as male urethral secretions and semen were examined using the molecular PCR method. These samples were obtained from couples presenting with infertility issues at Bentolhoda Hospital during the period of 1396-1400. After identifying positive samples using the Multi Locus Sequence Typing method, they underwent molecular evaluation.

Results: Out of a total of 268 samples examined, 44 samples (16.4%) tested positive for *Chlamydia trachomatis*, and 21 samples (7.8%) tested positive for *Ureaplasma urealyticum*. Then, the molecular typing of *Chlamydia trachomatis* was performed using the MLST (Multi Locus Sequence Typing) method. Interestingly, only two types, ST4 and ST80, were observed in the samples. Similarly, for *Ureaplasma urealyticum*, only two types, ST9 and ST12, were observed.

Conclusion: In the present study, unlike studies in other parts of the world where there is high genetic diversity and various types are circulating in each geographical region, we observed only two types in our region. This could be due to cultural and religious reasons. Firstly, in Iran, sexual relations are highly limited and controlled, usually occurring between couples. Secondly, multiple sexual partnerships do not have significant meaning in Iran. To make better decisions regarding the circulating types and to adopt proper preventive and treatment methods, it is recommended to conduct similar studies on a broader scale in other parts of the country.

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Management and Pathogens of Ventilator-Associated Pneumonia in Critical Care

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Keywords:
Ventilator-associated pneumonia (VAP), Pathogens, Management

ABSTRACT

Ventilator associated pneumonia (VAP) is a type of hospital associated pneumonia that develops after more than 48 hours of mechanical ventilation, contributing significantly to morbidity and mortality in critical care settings. VAP can be caused by a wide range of pathogens and may be polymicrobial. In both adult and pediatric VAP cases, the most common organisms are Staphylococcus aureus and *Pseudomonas aeroginosa*. Other frequent culprits are aerobic gram-negative bacilli and gram-positive cocci. In pediatric patients, additional pathogens may include *Klebsiella pneumonia*, *Serratia spp*, *Haemophylus influenza*, *Stenotrophomonas maltophila*. Respiratory syncytial virus (RSV) plays a significant role in pediatric VAP. Fungal infections though rare, may occur in immunocompromised patients. Pediatric VAP pathogens are less likely to exhibit antimicrobial resistance compared to adult cases owing to reduced exposure to healthcare environments and antimicrobial agents. In managing VAP, consideration of risk factors for resistant organisms is critical. Empiric treatment regimens should provide broad coverage, including agents effective against *Staphylococcus aureus*, *Pseudomonas aeroginosa* and other gram-negative bacilli to improve patient outcomes.

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Microbiota's Role in The Prevention of Infections (NGPs Modulation)

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ARTICLEINFO

Orals

Keywords:
New generation probiotics, Microbiome, Infection

ABSTRACT

The microbiome is a term that usually refers to the community of various microorganisms that inhabit in human body. The environment, lifestyle and diet are the major factors influencing the microbiome's composition. At this time, there is a growing interest in next-generation probiotics (NGPs) as biotherapeutics that alter the gut microbiome and affect various diseases development. The introduction of new generation probiotics represents a significant improvement in the field of microbiome research and gut health management. Compared to traditional probiotics, they are characterized by diverse strain profiles, and advanced mechanism of action. Based on different studies, they are efficient in promoting gut health by recovering microbial balance and alleviating gastrointestinal disorders such as irritable bowel syndrome (IBS) and inflammatory bowel disease (IBD). Moreover, new generation probiotics interact and stimulate intestinal immune cells, potentially reducing the incidence of infections and autoimmune conditions. NGPs have shown potential in treating various neurological and psychiatric disorders, including depression and anxiety. Additionally, emerging evidence suggests a role in weight management as well as insulin sensitivity. Beyond digestive benefits, these probiotics have shown potential effects in enhancing skin health and restoring effect in the gut microbiome after antibiotic treatment, minimizing side effects like diarrhea. Despite the promising potential of new generation probiotics, there are several challenges that limit their widespread adoption in the market such as their rare approval from regulatory agencies and restricted methods for the culture and storage of these oxygen-sensitive microbes. Given the multifaceted health effects of new generation probiotics, further research is warranted to understand the exact role of NGPs in the prevention and the development of new therapeutic concepts for most diseases. Furthermore, future research should emphasize the isolation and safety of NGPs for the treatment of vari¬ous disorders in humans.

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Multi-Antigen Immunization with MPLA Adjuvant Induces Effective Immune Responses against Neisseria Gonorrhoeae

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ARTICLEINFO

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Keywords:
Neisseria gonorrhoeae, Vaccine; Immunization, LtgC; LptD, Monophosphoryl lipid A

ABSTRACT

Introduction: Neisseria gonorrhoeae is an escalating global health threat due to increasing antimicrobial resistance. The emergence of multidrug-resistant strains necessitates alternative prevention strategies. This study focuses on the development of a recombinant multi-antigen vaccine targeting two conserved proteins, LptD and LtgC to overcome these challenges.

Materials and Methods: LtgC and LptD genes of *N. gonorrhoeae* ATCC 19424 were amplified, cloned into the pET28-a vector, expressed in *Escherichia coli* BL21 (DE3), and purified using Ni-NTA affinity chromatography. Specific IgG levels against the recombinant proteins in gonorrhea patients were assessed using ELISA. Recombinant proteins were formulated with monophosphoryl lipid A (MPLA) and administered to BALB/c mice in three doses with two weeks intervals. Total IgG, IgG1, IgG2a, and IgA levels of serum and vaginal samples were measured using ELISA. Moreover, serum bactericidal (SBA) and opsonophagocytosis (OPA) assays were conducted.

Results: The specific-IgG levels against both proteins were considerably higher in serum of gonorrhea patients compared to healthy participants. Animal model studies showed that all vaccine formulations significantly increased total IgG levels compared to controls, with peak IgG levels observed on day 56. The LptD group exhibited the highest specific IgG level, significantly outperforming MltA and the combination group. Long-term IgG levels on day 112 were highest in the group receiving the multi-antigen formulation, which also yielded the strongest total IgG response in the whole-cell ELISA. The IgG1/IgG2a ratio 1 in all formulations indicated a Th1-polarized response. LptD formulation elicited the highest serum IgA levels, followed by multi-antigen formulation. Vaginal IgA responses were minimal in all groups, likely due to the systemic administration route. In addition, the multi-antigen formulation achieved the highest SBA and OPA titers, indicating robust bactericidal and opsonophagocytic activity.

Conclusion: The study successfully developed and tested a recombinant multi-antigen vaccine targeting *N. gonorrhoeae*. This formulation showed the most potent immunogenicity, evidenced by higher antibody levels, SBA and OPA titers compared to single-antigen formulations. The Th1-polarized immune response further underscores the vaccine's potential to elicit a protective immune profile. These findings suggest that this multi-antigen approach could be a promising candidate for a gonococcal vaccine, offering a strong defense against multidrug-resistant strains.

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National Report on Healthcare-Associated Infections in Iran: Overview from the 2023 Data of The Iranian Nosocomial Infections Surveillance (INIS) System

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ARTICLEINFO

Orals

Keywords:
Antimicrobial resistance, Healthcare-associated infections, Surveillance, Iran

ABSTRACT

Introduction: Healthcare-associated infections (HCAIs) pose a major challenge to healthcare systems, with an increasing trend observed in many care facilities in recent years. The numerous complications associated with HCAIs highlight the importance of accurately assessing their incidence in order to develop and implement effective prevention strategies. Accordingly, this study aimed to provide an updated assessment of HCAI incidence rates in Iranian hospitals for the year 2023.

Materials and Methods: Here, the Iranian Center for Communicable Diseases Control (ICDC) analyzed data from 1,066 hospitals using the Iranian Nosocomial Infection Surveillance (INIS) system. Each hospital's trained infection control personnel collected the information and subsequently entered it into the INIS. The CDC/NHSN case definition criteria guided the diagnosis of HCAIs. This study was approved by the Ethics Committee of the Center for Communicable Diseases Control, Ministry of Health and Medical Education, Tehran, Iran.

Results: The study reported 170,948 cases of healthcare-associated infections (HCAIs) among 11,043,373 hospitalized patients, indicating an incidence rate of 4.95 per 1,000 patient-days. The overall mortality rate was 19.85%. Pneumonia was the most common infection, accounting for 28.32% of cases, followed by urinary tract infections (UTIs) at 26.6% and surgical site infections (SSIs) at 21.85%. HCAI rates were significantly higher in intensive care units, transplant wards, and burn units compared to other hospital departments. Major cardiovascular, neurosurgical, and orthopedic procedures showed the highest SSI rates. *Klebsiella* and *E. coli* were the most frequently identified pathogens, with prevalence rates of 16.56% and 14.6%, respectively. Additionally, we reported rates of Methicillin-resistant *Staphylococcus aureus* (MRSA), *Vancomycin-resistant Enterococcus* (VRE), and *Klebsiella pneumoniae* carbapenemase (KPC) at 43.2%, 65.24%, and 74.21%, respectively.

Conclusion: This study assessed the prevalence of healthcare-associated infections (HAIs) in Iran during 2023, underscoring the significant incidence of HAIs and the alarming resistance rates of the responsible pathogens. To address this issue, it is crucial to adhere to infection prevention and control (IPC) principles. Key measures include educating healthcare staff, implementing comprehensive strategies, ensuring strict compliance with antibiotic stewardship programs, and regularly updating IPC protocols and guidelines.

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Orbital Infection by Saksenaea Loutrophoriformis in An Immunocompetent Girl

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Keywords:
Mucormycosis, Mucorales, DNA sequencing, *Saksenaea*

ABSTRACT

Mucormycosis is a rare fungal infection caused by mucoralean fungi (order Mucorales, Mucormycotina) which can cause acute, disfiguring, and angioinvasive infections in immunocompromised patients. Mucormycosis can be seen as sino-orbital, rhino-cerebral, pulmonary, cutaneous, gastrointestinal, and disseminated with high rate of mortality and morbidity if not treated properly. Underlying risk factors include uncontrolled diabetes mellitus, cancer, leukaemia, use of corticosteroids, antibiotics, renal insufficiency, trauma, burn wounds, desferrioxamine therapy, and Coronavirus disease Mucormycosis is caused by at least 35 different species of mucorales, mainly *Rhizopus*, *Mucor*, and *Lichtheimia* who are responsible for up to 70-80% of all cases. whereas *Cunninghamella*, *Apophysomyces, Saksenaea*, *Rhizomucor*, *Cokeromyces*, *Actinomucor*, and *Syncephalastrum* are responsible for less than 1-5% of reported cases. We report a case of an immunocompetent 7-year-old girl with orbital mucormycosis caused by *Saksenaea loutrophoriformis* from Mashhad, Iran. This rare infection was the consequence of an injury with a tree branch. The causative agent was identified by histopathology, routine mycological methods, and DNA sequencing of the Internal Transcribed Spacer 1 and 2 regions including the intervening 5.8S gene (ITS) and the partial large subunit region D1 and D2 (LSU). Sequences were deposited in Genbank. The causative agent was identified as *S. loutrophoriformis* and deposited in CBS collection (CBS 150004). The patient was successfully treated with surgical debridement and antifungal treatment of amphotericin B and oral posaconazole. Molecular diagnosis is crucial in absence of sporulation and to avoid misidentification and late diagnosis. Reporting this rare infection in an immunocompetent host is valuable for awareness of clinicians.

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Phase I, Single-Ascending-Dose Study to Assess the Safety and Tolerability of Pexiganan Spray in Healthy Subjects

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ARTICLEINFO

Orals

Key words:
Antimicrobial peptides, Pexiganan, Safety, Tolerability, Phase I, Randomized clinical trial

ABSTRACT

Introduction: Considering that antibiotics were traditionally used as the most effective treatment for infections, their effectiveness has decreased with the increase of bacterial resistance and has led to a global clinical challenge. During the last decade, antimicrobial peptides have been identified as a promising alternative strategy for the treatment of infections, especially skin and wound infections. In this research, we intend to measure the safety and maximum tolerable dose (MTD) of pexiganan antimicrobial peptide spray on the skin of healthy volunteers in order to conduct a phase one clinical trial study.
Materials and Methods: A single ascending dose protocol used to investigate the safety and tolerability topical use pexiganan spray in healthy volunteers. Eligible candidates were assigned to intervention and control groups based on eligibility criteria (inclusion and exclusion criteria) after obtaining informed consent form, using block randomization method. Thirty participants (5 cohorts consisting of 6 subjects) were included in the study and were followed for 3 days after dosing. Subjects were assigned to one of the five groups received 7, 14, 28, 42, 56 mg/L. The participants in the intervention group received the Investigational Medicinal Product (pexiganan spray) and similarly the control group received placebo (distilled water spray).
Results: Safety evaluations: No side effects, adverse events, or serious adverse events occurred in any of the volunteers. Also, in the evaluation of local skin reactions, no skin irritation was observed. Tolerability assessment: pexiganan antimicrobial peptide spray was well tolerated and the MTD was 56 mg/L, which is 4 times the minimum inhibitory concentration.
Conclusion: Pexiganan antimicrobial peptide spray is safe and well tolerated when applied topically to the skin of healthy volunteers, which could support further efficacy investigation and great potential for a new treatment modality for infections. This study has been registered at IRCT under identifier 20190924044863N1

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Phenotypic and Genotypic Characteristics of Escherichia coli Strains Isolated from Blood Cultures of Leukemia Patients

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Keywords:
Escherichia coli, Leukemia, Virulence factors, Biofilm, Antibiotic resistance, ERIC-PCR

ABSTRACT

Introduction: Despite advances in the treatment of hematological malignancies, bloodstream infections (BSIs) remain a significant threat, with a mortality rate of 40%. A notable trend over the past decade indicates a shift in the causative bacterial species from Gram-positive to Gram-negative bacteria, particularly highlighting *Escherichia coli* as a common pathogen among patients with these malignancies. This study aimed to examine the phenotypic characteristics, such as antibiotic resistance and biofilm formation, as well as the genotypic characteristics, including virulence factors and genetic diversity, of *E. coli* strains isolated from leukemia patients.

Material and Methods: *E. coli* isolates from blood cultures of leukemia patients in oncology departments in Tehran and Rasht hospitals were collected. Their antibiotic resistance was assessed using disk diffusion and microbroth dilution methods, while the capacity for biofilm formation was evaluated through the microtiter plate method. The presence of various genes, including virulence and resistance genes for beta-lactam and fluoroquinolone antibiotics, was analyzed using PCR. Additionally, the genetic relationship among the isolates was detected using the ERIC-PCR technique.

Results: In the study of 67 *E. coli* strains from leukemia patients' blood cultures, 33% were from females and 67% from males. The lowest prevalence was in individuals aged 80-90 (2%), while the highest was in the 50-60 age group (24%). Acute myeloid leukemia had the highest *E. coli* frequency (54%), while acute lymphoid leukemia had the lowest (3%). Overall, 53.7% of isolates were ESBL-positive, with blaCTX-M as the most common beta-lactamase gene and 47% exhibiting qnr genes. Resistance to ampicillin reached 92%, while sensitivity to imipenem was also 92%. Virulence factors were present in a majority of isolates: hlyA (55.2%), traT (77.6%), iutA (59.7%), and afa (53.7%). High genetic diversity was noted among isolates based on ERIC-PCR analysis.

Conclusion: Our study underscores the continued significance of monitoring the prevalence and characteristics of *E. coli* bloodstream infections in patients with leukemia or hematologic malignancies to guide effective antimicrobial therapy and infection control measures.

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Post-infectious Cerebellar Ataxia

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Keywords:
Cerebellar ataxia, Post-infectious cerebellar ataxia, Children

ABSTRACT

The clinical syndrome known as Acute cerebellar ataxia (ACA) is typically a benign and self-limiting condition, affecting individuals of all ages. However, children under the age of six are the most commonly affected. A common cause of acute ataxia in children is acute post-infectious cerebellar ataxia (APCA), which typically develops after bacterial or viral infections. For example, infectious agents such as coxsackievirus, echovirus, enteroviruses, Epstein-Barr virus, hepatitis A virus, herpes simplex virus 1, human herpes virus 6, measles virus, mumps virus, parvovirus B19, Borrelia burgdorferi, and Mycoplasma pneumonia have all been linked to the pathogenesis of ACA. Additionally, ACA can arise from multiple etiologies, including intoxications, vascular or tumorous lesions, and infections of the central nervous system, most of which occur post-infections. There are different clinical manifestations including gait disturbance and nystagmus, dysarthria, vomiting, headache, seizures, and even alterations of consciousness in patients with ACA. Treatment for post-infectious acute cerebellar ataxia lacks guild line; however, early intravenous immunoglobulin intervention may prevent unfavorable outcomes, particularly in cases where high-dose steroid therapy is ineffective. Therefore, using neuroimaging and laboratory tests to determine the etiology of ACA may aid in patient diagnosis and treatment. In this study, we assess the images of brain MRI and the etiology of acute post-infectious cerebellar ataxia in children.

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Role of Imaging in Central Nervous System Infections

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Keywords:
Central nervous system, Infection, Magnetic resonance imaging, Magnetic resonance spectroscopy, Perfusion weighted magnetic resonance imaging, Diffusion weighted magnetic resonance imaging

ABSTRACT

Recognition and characterization of central nervous system infections poses a formidable challenge to the neuro-radiologist. Imaging plays a vital role, the lesions typically being relatively inaccessible to tissue sampling. The results of an accurate diagnosis are endlessly rewarding, given the availability of excellent pharmacological regimen. The availability of numerous magnetic resonance (MR) sequences which provide functional and molecular information is a powerful tool in the hands of the radiologist. However, the plethora of sequences and the possibilities on each sequence is also intimidating, and often confusing as well as time consuming. While a large number of reviews have already described in detail the possible imaging findings in each infection, we intend to classify infections based on their imaging characteristics. In this review we describe an algorithm for first classifying the imaging findings into patterns based on basic MR sequences (T1, T2 and enhancement pattern with Gadolinium), and then sub-classify them based on more advanced molecular and functional sequences (Diffusion, Perfusion, Susceptibility imaging, MR Spectroscopy). This patterned approach is intended as a guide to radiologists in-training and in-practice for quickly narrowing their list of differentials when faced with a clinical challenge. The entire content of the article has also been summarized in the form of flow-charts for the purpose of quick reference. Most infections in the CNS may be classified in one of the following categories based on their T1, T2 and contrast enhancement characteristics demonstrating a typical lesion in each category: Ring enhancing lesions, Basal ganglia space occupying lesions, Grey matter hyperintensities, White matter hyperintensities Imaging features of CNS infections constitute a complex myriad. Their classification based on conventional MRI sequences, may provide a quick guide to narrowing the differential diagnosis followed by further sub-differentiation into single etiology using advanced MRI sequences and techniques.

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Short-term Prognosis of Neonatal Sepsis

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Keywords:
Prognosis, Sepsis, Prematurity, Microorganism, Gram-negative, Gram-positive, Death

ABSTRACT

Introduction: Neonatal sepsis is a severe systemic bacterial infection that effects on premature neonates prognosis. Therefore, the aim of this study was to evaluate the short-term prognosis of neonate's infection.
Materials and Methods: The present study is a cross-sectional study that was performed on 729 neonates suspected of infection in Ghaem Hospital of Mashhad during the years 2015 to 2022 by available sampling. The data collection tool was a researcher-made checklist containing neonatal characteristics (gestational age, birth weight, first and fifth minute apgar score, neonatal status at discharge)) and laboratory information (White Blood Cell, PLT, C-reactive Protein, blood culture, Cerebro-spinal fluid culture). Neonatal prognosis was compared as death or discharge among neonates with and without definitive infection. Data were analyzed by Kolmogorov-Smirnov, T test and Chi-square tests.
Results: According to the results of this study, low birth weight and lower gestational age and lower Apgar score increase the risk of neonatal death. About one-fifth of infants died of definitive infection. Death from infection was about 5 times that of the neonatal group that discharged. Forty four percent of infants with early sepsis and 40% of infants with late sepsis died. In cases of neonatal death due to sepsis, the most common gram-negative infectious agent was *Acinetobacter* and the most common gram-positive infectious agent was *enterococcus*.
Conclusion: Neonatal definitive infection worsens their prognosis. So, the risk of neonatal death increases by 5 times. The probability of death in meningitis is more than sepsis and in early sepsis is more than late sepsis and in sepsis due to gram-negative is more than gram-positive.

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Spiritual Health in Health- care System

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Keywords:
Spiritual, Health-care, Factors

ABSTRACT

Today, what affects people's comprehensive health is the views and social and spiritual factors that can ensure people's health. Emphasis on the approach of a healthy person and comprehensive physical-psychological-social-spiritual health in health policymaking is important. It is special. At the Earth Summit that took place in Rio de Janeiro in 1992 with the presence of world leaders, human beings were considered to be the central factor of sustainable development. And providing comprehensive human health was considered one of the primary duties of governments and one of the indisputable rights of the people. In the progressive constitution of the Islamic Republic of Iran, serious attention has been paid to this matter, and Article 29 is considered a symbol of it. The definition of a healthy person as a productive person in a social position in health management fields is clear, and the task of managers to achieve it is clear from the fetal time (even before that) and the mother's pregnancy to old age. It is interesting to remember that in 2002, the World Health Organization proved in the big research “Health and Macroeconomics” that investing in achieving comprehensive physical-mental-spiritual-social health of people and providing the definition of a healthy person is the most profitable. The investment method is even for investment return. Research method: In this review research, related articles have been extracted and analyzed from among numerous articles by searching in reliable databases such as science direct, PubMed, Iran doc, Iranmedex and Sid. Spiritual health is a state with various degrees, in which the vision, inclination and ability necessary for the exaltation of the soul, which is the closeness to the balanced God, is provided in accordance with the capacities and capabilities of the individual, in such a way that all the internal possibilities to In a coordinated and balanced way, they can be used towards the overall goal and along with the possibility of choice, internal, and external voluntary behaviors corresponding to God, individual, society, and nature emerge. The spiritual point of view has a profound effect on beliefs, attitudes, and values.

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Statistical Report of RSV Symptoms in Hospitalized Children Under One Year of Age

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Keywords:
RSV, Statistical report, Symptoms, Children under one year, Respiratory infections

ABSTRACT

Introduction: *Respiratory syncytial virus* (RSV) is the leading cause of respiratory infections in infants worldwide and the second leading cause of death in the first year of life. This highly contagious virus causes about 3 million hospitalizations and 120,000 deaths per year among children fewer than 5 years of age. This article examines the clinical symptoms associated with RSV infection in the population of infants less than one year of age. Common manifestations include mild upper respiratory tract symptoms such as rhinorrhea and cough, which can progress to more severe manifestations such as wheezing, bronchiolitis, and pneumonia. Infants may show signs of respiratory distress, including tachypnea, convulsions, and cyanosis. Onset of symptoms usually occurs within the first few days after infection and peaks in severity often within a week. Hospitalization may be required for infants with significant respiratory distress or dehydration.

Materials and Methods: In this study, 50 children under one year of age who were hospitalized with a primary diagnosis of bronchiolitis were tested for RSV virus by real-time PCR method, and the following results were obtained.

Results: A total of 15 people tested positive for RSV, and the statistical report of RSV symptoms in children under one year is as follows: About 66.6% cough, 46.6% fever, 20% rhinorrhea, 30% wheezing, 53.3% respiratory distress, 26.6% diarrhea and vomiting and 6.66% death were reported.

Conclusion: Early detection of RSV symptoms is critical for timely intervention and management to reduce the risk of complications. Understanding these clinical features is essential for health care providers in the effective diagnosis and treatment of RSV in young children.

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The Importance of T-cell Subsets and the Relative Cytokines Levels in the Pathogenesis of Helicobacter Pylori in Adult and Pediatric Patients

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ARTICLEINFO

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Keywords:
T cell subset, Cytokine, Adult, Children, H. pylori

ABSTRACT

Introduction: *Helicobacter. Pylori* (H. pylori) infection is the main cause of inflammatory diseases of the upper digestive tract and a high risk factor for gastritis peptic ulcer and stomach cancer.it is able to escape the host's immune response and induce persistent inflammation. T cell immunity plays a key role after inflammation, and even affects the prognosis of the disease. To Investigate of T cell subsets and inflammatory and pro-inflammatory cytokine levels in adult and pediatric patients suffering from *H. pylori* infection.

Materials and Methods: 146 samples (76 Adults, 70 Children) of patients with dyspepsia symptoms were collected. The percentage of Th17, Tc17, Th22, Tc22, Th9 and Tc9 were measured by Flow cytometry. The inflammatory and pro-inflammatory cytokine in serum and supernatants were determined by Flow cytometry and ELISA.

Results: Patients were divided into two group's adults infected (44.8% male, 55.2% female), and children infected (39.2% male, 60.8% female) with the age range of 2-85 in patients. The percentage of Th17, Th22, Th17/22 and Th9 in the infected adults and Th22, Th17/22, Tc22, Tc17/22 and Th9 in the infected children were significantly higher than uninfected patients ($p \leq 0.01$). Also a significant increase was seen in the level of IL-17A, IL-23, IL-22, IL-21 and IL-6 in H. pylori infected patients compared to uninfected group ($p \leq 0.01$).

Conclusion: Th17/22 cell in adults and Tc17/22 in children play an important role in H. pylori associated gastritis condition and can be candidates for treatment in these two groups.

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The Incidence of Nontuberculous Mycobacteria (NTM) in Iran

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ARTICLEINFO

Orals

Keywords:
Nontuberculous mycobacteria (NTM), Prevalence, *Mycobacterium simiae*, Clinical samples, Drug resistance

ABSTRACT

Introduction: Nontuberculous mycobacteria (NTM) are environmental organisms that can be isolated from various sources, including animal products, domestic water systems, and medical equipment. NTM are a known cause of infections, especially in immunocompromised individuals. They are increasingly recognized as important pathogens because their clinical manifestations often mimic those of tuberculosis (TB). This study aimed to provide a comprehensive overview of the prevalence of NTM in clinical samples collected in Iran between 2000 and 2022, addressing gaps in previous meta-analyses conducted in the region.

Materials and Methods: This study followed the PRISMA guidelines to conduct a systematic review and meta-analysis. It included original cross-sectional research published in Persian and English between January 2000 and December 2022. The databases searched included Scopus, PubMed, Web of Science, Google Scholar, and Iranian databases like Magiran. The prevalence of NTM was determined through a meta-analysis, focusing on the proportion of NTM in positive mycobacterial cultures, with results expressed at a 95% confidence interval.

Results: A total of 26 studies were included in the review. The overall prevalence of NTM in clinical samples was found to be 4.5%, with the highest rates in respiratory samples. Slowly growing NTM species, such as "*Mycobacterium simiae*" (35.8%), "*Mycobacterium intracellulare*" (19%), and "*Mycobacterium kansasii*" (13.4%), were the most commonly isolated. Among the rapidly growing species, "*Mycobacterium fortuitum*" (24.6%), "*Mycobacterium terrae*" (18.5%), and "*Mycobacterium gastri*" (15.9%) were predominant. The heterogeneity among studies was high, potentially due to variations in diagnostic methods, sample types, and regional factors.

Conclusion: The findings highlight a significant prevalence of NTM in clinical samples across Iran. NTM infections can present similarly to TB, complicating diagnosis and treatment, especially since they are often resistant to standard anti-TB drugs. The study emphasizes the need for standardized molecular diagnostic methods to accurately detect and differentiate NTM from TB to avoid misdiagnosis and inappropriate treatment. Implementing such measures is crucial in regions with high TB prevalence.

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The Potency of CD24+ and CD54+ Apoptotic Bodies in Cerebrospinal Fluid for The Differential Diagnosis of Bacterial and Viral Meningitis

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ARTICLEINFO

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Keywords:
Apoptotic bodies,
Bacterial meningitis,
Viral meningitis

ABSTRACT

Introduction: Since differentiation of bacterial and viral meningitis is a challenge to rapid and precise treatment of the patients and to decrease the disease outcome, the present study aimed to detect the frequency of apoptotic bodies in the cerebrospinal fluid (CSF) and their association with the cause of infection in order to define a discriminative biomarker for differential diagnosis of bacterial and viral meningitis.

Materials and Methods: The study conducted on 1115 CSF collected from the patients clinically suspicious to meningitis. CSF was directly analyzed to evaluate leukocyte count, protein and sugar concentration and to determine bacterial causative agents using direct smear, gram staining and culture on blood and chocolate agar. Furthermore, to determine viral meningitis, PCR methods were used to detect the presence of viral agents such as *Herpes simplex virus* type 1 (HSV 1) and *Enterovirus* (ENV). Given the leukocyte count, the samples were divided to CSF with less or more than 5 leukocyte per ml as negative and positive CSF, respectively. Then CSF were assessed for the frequency of apoptotic bodies stained with flurochrome labeled anti CD24 and CD54 antibodies using flow cytometry.

Results: Among 1115 CSF, 77 samples were positive (WBC 5/ml), therefore from negative samples, 77 CSF was randomly selected to determine the apoptotic bodes. The samples were collected from 74 male and 80 female. Of positive CSF, 10 and 12 were positive with bacterial and viral agents and 55 with unknown cause (UC) of infection. The levels of CD24+, CD54+ and CD24/CD54+ apoptotic bodies in bacterial (241 ± 256, 300 ± 418 and 333 ± 347), viral (184 ± 289, 253 ± 181 and 185 ± 79) and UC (265 ± 322, 139 ± 475 and 142 ± 148), respectively, were not significantly different; however their frequencies were substantially different from negative CSF.

Conclusions: The levels of apoptotic bodies in CSF can differentiate positive (5 WBC) from negative (5wbc) CSF, however these were not capable to differentiate bacterial from viral meningitis which may the consequence of the lower positive rate of bacterial and viral meningitis.

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The Prevalence of Nosocomial Fungal Infections in Namazi Hospital, Shiraz, South of Iran

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ARTICLEINFO

Orals

Key words:
Nosocomial fungal infections, Aspergillus flavus, Aspergillus fumigatus, Candida albicans, Mucorals

ABSTRACT

Introduction: Candida and various molds like *Aspergillus*, *Mucorales*, and *Fusarium spp*., are common causes of nosocomial fungal infections. These infections are challenging to identify and cause high morbidity and mortality. This study aimed to detect the incidence of nosocomial fungal infections in patients admitted to a university hospital.
Materials and Methods: Fungal colonization of patients was evaluated by cultures of samples from the mouth, nose, ears, and anus. Clinical samples of high-risk patients were assessed for fungal infections using direct microscopic examination, culture, and molecular methods.
Results: Totally, 14391 patients were admitted to the hospital wards during the study period (10 months) and 4080 cases were entered in this study. Three hundred forty-three cases were suspected of nosocomial fungal infections, and 79 patients suffered from proven and probable nosocomial fungal infections (79/4080, 1.9%). Of these, 61.2% of patients were male. *Candida* species were isolated from 76/343 (22.2%) patients as colonization. The rate of infections was significantly higher in ICU wards. Respiratory infections were the most frequent sites of infection. The isolated species were *Aspergillus flavus*, *Aspergillus fumigatus*, and *Candida* species like *Candida albicans*, *Candida glabrata*, *Candida parapsilosis*, and *Mucorales*. The most common risk factors were immunosuppressive conditions in patients like liver transplants, hematologic disorders, and extended stays in ICU wards.
Conclusion: Although the standard of care for many fungal infections has changed due to the availability of novel antifungal medications, there is still a significant death rate from nosocomial fungal infections. Development of novel treatment and preventive measures along with early detection techniques like molecular-based methods are necessary to manage this infection.

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The Role of Clinical Mycology Laboratory in The Care of Infectious Diseases: An Experience from Iran

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ARTICLEINFO

Orals

Keywords:
Candidiasis,
Aspergilosis,
Cryptococcosis,
Aspergillus fumigatus,
Candida glabrata,
Candida auris

ABSTRACT

The global burden of invasive fungal infections has shown an upsurge in recent years due to the higher load of immunocompromised patients. It can also occur in immunocompetent patients admitted to the intensive care unit, without classical host factors. Around 1.9 million patients get an acute infection each year and 3 million people globally suffer from chronic fungal infections. Nearly 70% of all invasive fungal infections in the world are caused by invasive candidiasis (IC), followed by cryptococcosis (20%) and aspergillosis (10%). Invasive aspergillosis in immunocompromised individuals has an extremely high mortality rate ranging between 40 and 90%. In the case of invasive fungal infections, studies show significant increases in mortality and hospitalization costs for each day without the proper antifungal medicines. All the conventional laboratory approaches, including microscopy, histopathology, and culture-based tests rely heavily on personnel with high levels of expertise in fungal identification and are time-consuming. Resistant fungi like azole-resistant *A. fumigatus*, *Candida glabrata*, and *Candida auris* present need to use sensitivity methods to evaluate the sensitivity of the etiologic agents. The relationship between serum antifungal concentration and infection progression plays an important role in the management of patients. Several factors may lead to voriconazole plasma concentrations, including age, sex, weight, drug interactions, genetic polymorphisms in CYP2C19, and gastrointestinal abnormalities. Since resistance to antifungal agents has been seen in patients, early identification of etiologic agents and susceptibility testing assist with determining the appropriate antifungal agents for treatment, and monitoring antifungal plasma concentration has an important role in managing infected patients.

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The Role of Fermented Foods in Preventing Gastrointestinal Infections

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ARTICLEINFO

Orals

Keywords:
Fermentation, Food, GI infection, Microbiota, Probiotic

ABSTRACT

Human microbiota consists of trillions of microbial cells that play a vital role on many aspects of human health and its composition is largely influenced by diet. On the other hand, fermented foods comprise a significant part of consumers' diet for the centuries and defined as “foods or beverages produced through controlled microbial growth, and the conversion of food components through enzymatic action”. Fermented foods encompass a wide range of food categories, including vegetables, fruits, dairy, meat, legumes, and cereals. Although, fermentation is as a method of preservation to reduce the risk of contamination and spoilage with undesirable microorganisms, it is used to enhancement of organoleptic properties, and also potential health benefits of organoleptic properties, and also potential health benefits. The health-promoting effect of fermented products is due to the presence of functional microorganisms (especially probiotics) as well as its metabolites. Microorganisms present in fermented foods can directly or indirectly affect the gut microbiome; for example, imbalance of microorganisms in the gut microbiota associated with metabolic disorders potentially is modulated and modified. Additionally, many fermented foods contain bioactive compounds as a result of microbial metabolic. Regardless of whether or not the microbes (pro/parabiotics) remain in the food, consumption of these compounds confers health benefits. While fermented foods offer beneficial properties, the presence of antibiotic-resistant microorganisms within these food products raises concerns regarding their influence on human health which should be consider. Also, the use of poor-quality ingredients and inadequate hygiene conditions in the processing and storage of fermented foods could be resulted in the presence of pathogenic microorganisms or their toxins in the food and consequently gastrointestinal infections.

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The Role of Immunology Lab in Infectious Diseases

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ARTICLEINFO

Orals

Keywords:
Immunology, Infectious diseases, Biomarkers and cytokines

ABSTRACT

Based on the research lines of the Professor Alborzi Clinical Microbiology Research Center (PACMRC) affiliated with Shiraz University of Medical Sciences, the Department of Immunology has focused on immunopathogenesis, immunogenetics, and special immunologic biomarkers involved in the diagnosis, prognosis, and prediction of outcome of the diseases such as visceral leishmaniasis, brucellosis, and meningitis. For this purpose, several studies have been conducted on the genetic variants of the cytokines such as IFN-γ, LT-α, TLR4, IL-1β, IL-4, IL-6, IL-10, IL-12, IL-13, IL-15, IL-17, IL-18 and IL-22. The results revealed that some of these variants can act as protective or predisposing factors in response to the intracellular microorganisms including *leishmania* parasites and *brucella* species in individuals living in the endemic areas. Furthermore, investigation of the association of two recently discovered T helper subsets such as Th9 and Th22 revealed the role of these subsets in the immunopathogenesis of human visceral leishmaniasis. The results may imply dysregulation of the immune response in the active phase of visceral leishmaniasis rather than Th1/Th2 responses. As a big challenge in the differential diagnosis of bacterial and viral meningitis, determining the immunologic biomarkers and cytokines as the important mediators of the immune system in CSF samples may be valuable factors for the rapid and accurate differential diagnosis of the causative agents of meningitis. The results showed that the concentration of IL-6, IL-10, and IFN-γ was more frequent in bacterial compared to viral meningitis which could be beneficial in the CSF assay results interpretation, especially in pre-treated meningitis patients.

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The Role of Treatment in Immunodeficiency

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ARTICLEINFO

Orals

Keywords:
IvIG, Antibiotic, Vaccination, Immunocompromised

ABSTRACT

Immunodeficiency in children can arise from various causes, including genetic disorders, infections, or environmental factors. The treatment approach depends on the underlying cause and the severity of the condition. Here are some common strategies used in the management of immunodeficiency in pediatric patients: 1. Immunoglobulin Replacement Therapy: For children with primary immunodeficiencies characterized by low levels of immunoglobulins, intravenous immunoglobulin (IVIG) or subcutaneous immunoglobulin (SCIG) therapy may be administered. This helps to boost the immune system and reduce the frequency and severity of infections. 2. Antibiotic Prophylaxis: Children with certain types of immunodeficiency may benefit from prophylactic antibiotics to prevent infections. This is particularly important in those with specific antibody deficiencies or those undergoing treatments that compromise their immune function. 3. Stem Cell Transplantation: In cases of severe combined immunodeficiency (SCID) or other life-threatening immunodeficiencies, hematopoietic stem cell transplantation may be considered. This procedure aims to restore normal immune function by replacing the defective immune system with healthy stem cells from a compatible donor. 4. Gene Therapy: Emerging treatments, such as gene therapy, are being explored for certain genetic immunodeficiencies. This approach aims to correct the underlying genetic defect responsible for the immunodeficiency. 5. Management of Infections: Prompt and aggressive treatment of infections is crucial in children with immunodeficiency. This may involve hospitalization, intravenous antibiotics, and supportive care to manage complications. 6. Vaccination: While some live vaccines may be contraindicated in immunocompromised children, inactivated vaccines are generally recommended to help protect against preventable diseases. Careful consideration and planning with a healthcare provider are essential to determine the appropriate vaccination schedule. 7. Nutritional Support: Ensuring adequate nutrition is vital for children with immunodeficiency, as it supports overall health and immune function. Nutritional assessments and interventions may be necessary. 8. Psychosocial Support: Children with immunodeficiency and their families may experience emotional and psychological challenges. Providing access to counseling and support groups can be beneficial in addressing these needs. In conclusion, the treatment of immunodeficiency in children is multifaceted and requires a personalized approach tailored to the individual needs of each patient. Collaboration

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A Study on the Prevalence of Vancomycin-Resistant Enterococcus and Antibiotic Susceptibility in Bloodstream Infection in Shiraz, Iran

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ARTICLEINFO

Orals

Keywords:
Prevalence, Vancomycin resistant Enterococci (VRE), Shiraz

ABSTRACT

Introduction: First reports on *Vancomycin-resistant Enterococcus* (VRE) emerged in the 1980s. VRE is considered to be a major nosocomial bloodstream infection that results in serious morbidity and mortality worldwide. The aims of this study were to detect the prevalence and the antimicrobial resistance patterns of VRE isolates.

Materials and Methods: Microbiology reports of blood culture bottle sent to Professor Alborzi Clinical Microbiology Research Center from hospitals in Shiraz were reviewed from March 2022 to March 2024. The isolates were identified as *Enterococcus* and identification among the isolates was performed according to the standard biochemical test such as catalase, Gram stain, growth in 6.5% sodium chloride medium, bile esculin hydrolysis test. Our brain heart infusion (BHI) Agar with 6µg/mL of vancomycin is used as a screening medium for VRE. Susceptibility testing (disc diffusion) was performed according clinical and laboratory standards institute (CLSI) guidelines.

Results: In our study, out of 89 Enterococcus, 72.1% were VRE. Linezolid had highest efficacy against *Enterococcus*. VRE had higher rate of resistance to oxacillin (100%), cefoxitin (98.7%), cefotaxime (94.2%) and Clindamycin (92.9 %).

Conclusion: *Enterococcus* species are common in nosocomial bloodstream infections and their incidence is rising. Since vancomycin is the first-line drug for treating multi-drug-resistant Enterococci in nosocomial bloodstream infections, the determination of the antibiotic resistance pattern of the VRE isolates is essential to tackle the spread of the strains.

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Underlying Causes of Acute Rheumatic Fever in Children

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ARTICLEINFO

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Keywords:
Acute rheumatic fever, underlying causes, children

ABSTRACT

Acute rheumatic fever is one of the significant complications of streptococcal pharyngitis. The most severe preventable complication of this disease is rheumatic heart disease, which imposes substantial costs on both individuals and the healthcare system. This study examines the underlying causes of acute rheumatic fever in children. Methodology: In this study, the existing medical records of hospitalized patients diagnosed with acute rheumatic fever who met the diagnostic criteria were reviewed. Factors contributing to the onset of the disease and the treatment approach during streptococcal pharyngitis were analyzed. Results: The disease had a higher incidence in males. The most common presentation in all patients was fever and arthritis. All patients were city dwellers, with 80% residing in central and southern areas. The most common cardiac involvement was mitral valve insufficiency. Laboratory findings indicated increased inflammatory markers in all patients. Most visits were made to general practitioners during the winter season. The most frequent causes of disease onset, in order of prevalence, were insufficient duration of antibiotic treatment, inappropriate antibiotic selection, and delayed treatment seeking. Conclusion: Given the risk factors for acute rheumatic fever and the absence of a national program for the diagnosis and treatment of streptococcal pharyngitis, strategies to improve family health, educate parents, raise awareness about the disease's complications and treatment, and develop diagnostic and therapeutic guidelines for streptococcal pharyngitis could help reduce the incidence of this disease.

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Uninterrupted Trends: The Resilience of Measles, Mumps, and Rubella Search Patterns during the COVID-19 Pandemic

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ARTICLEINFO

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Keywords:
Rubella, Mumps, Measles, Covid-19, Google

ABSTRACT

Introduction: The rise of digital data sources, such as Google Trends, has revolutionized how we monitor public interest in health topics. By analyzing search patterns, we gain insights into public awareness, which can influence responses to infectious diseases. This study focused on three vaccine-preventable diseases—measles, mumps, and rubella—and evaluated how interest in these diseases fluctuated over time, especially against the backdrop of major outbreaks and the COVID-19 pandemic. Previous studies have shown that online search trends often align with real-world incidence rates, highlighting public awareness and response to health threats. However, the impact of a pandemic like COVID-19 on interest in other diseases remains underexplored.

Materials and Methods: Google Trends data for measles, mumps, and rubella was collected from September 2009 to October 2024. Monthly search volumes were analyzed using SPSS, with ARIMA models and seasonal decomposition employed for time-series forecasting. The model's fit was assessed by Stationary R-squared, R-squared, Mean Absolute Percentage Error (MAPE), and the Ljung-Box Q-test for autocorrelation. To evaluate model accuracy, a Wilcoxon Signed Ranks Test was used to compare forecasted data with actual search volumes, and a General Linear Model (GLM) assessed the alignment of trends over time. Statistical significance was set at p 0.05.

Results: The model representing a combined trend across all diseases, showed the highest fit (MAPE=0.870, Ljung-Box Q-test p=0.101), with stable residuals. The Wilcoxon Signed Ranks Test revealed a significant difference between forecasted and actual data trends (Z=-6.680, p0.001), suggesting that search trends diverged from expected patterns, likely due to the COVID-19 pandemic. However, the GLM indicated no significant difference in trend slopes between the forecasted and actual data (p0.05), suggesting that, despite lower search volumes during the pandemic, the long-term trend remained stable.

Conclusion: The study reveals that while the COVID-19 pandemic temporarily suppressed search interest in measles, mumps, and rubella, it did not disrupt the overall trend, indicating ongoing public interest and awareness. These results suggest that digital surveillance tools like Google Trends are effective for monitoring health concerns, helping inform vaccination efforts and public health campaigns.

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Unveiling A Silent Threat: A 18-year Descriptive Study on Basidiobolomycosis in Pediatric patients, Their Clinical and Paraclinical Findings

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ARTICLEINFO

Orals

Keywords:
Basidiobolomycosis, Entomophthoromycosis, Fungal infection, Pediatrics

ABSTRACT

Introduction: First described in humans in 1956, Basidiobolomycosis is a rare, but challenging and on-the-rise fungal infection. The disease's similarity to other gastrointestinal disorders creates diagnostic dilemmas and delays in treatment. Herein, we aimed to investigate different dimensions of infection in pediatrics. Our study will be the first to describe the most original pediatric cases (59) to ever be reported.

Materials and Methods: This retrospective study examines pediatric basidiobolomycosis at Nemazee Hospital in southern Iran from 2006 to 2024, analyzing medical records to document sociodemographic, epidemiologic, clinical, and treatment details using standardized forms and SPSS for data analysis.

Results: Out of a total of 59 histopathologically diagnosed Basidiobolomycosis pediatric patients, the mean age was 4.5 ± 3.5 with a male-to-female ratio of 1.8. From 2006 to 2024 the years with the most verified cases were 2015 (15.3%) with a growing trend over 18 years. In terms of prevalence, the cities of Minab (20.3%) in Bandarabbas province, Darab (10.2%) in Fars province reflected the highest rate. 58.6% of our patients were prone to misdiagnosis. The most common miss diagnoses were malignancies (10.2%), appendicitis (6.8%), abscess (5.1%), and IBD (5.1%). The most common complaint symptoms were abdominal pain (81.4%), fever (66.1%), and palpable abdominal mass (35.6%). The predominant sites of involvement were identified in the ascending colon (27.6%), transverse colon (24%). General sonography and CT findings were GI tract wall thickening, prominent lymph nodes, hypoechoic lesions, abdominal cavity fat stranding, free fluid, and intussusception. The mean count for blood parameters was 19000 count/μL WBC, 64% neutrophil, 11% eosinophil.

Conclusion: With a notable increase in reported cases over the past 18 years, this research underscores the urgent need for heightened awareness among healthcare providers and the establishment of standardized diagnostic and treatment protocols.

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Vaccination in Immune-deficient patients

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ARTICLEINFO

Orals

Keywords:
Vaccination- Immune deficiency

ABSTRACT

Vaccination in Immune deficiency In primary immunodeficiency, inactivated vaccines could be administered. Live vaccines are contraindicated in severe immunodeficiency. In cases of immune suppressive therapy, live vaccines must be administered at least 4 weeks and inactivated vaccines at least 2 weeks before the start of treatment. Live vaccines are contraindicated from one month before the start of treatment, during treatment and at least 3 months after stopping treatment. It is not necessary to repeat the vaccines received before the treatment. BCG in infants with HIV infection should be postponed until the start of treatment and stable immune status. Infants with unknown HIV status and no clinical evidence should receive BCG. OPV is contraindicated in HIV infection without symptoms and in infection with symptoms or low CD4. HIV positive children without clinical symptoms or mild symptoms can receive MMR. Live vaccines should be postponed at least one month after treatment with high-dose prednisone for at least 14 days. In high-dose prednisone use for less than 14 days, live vaccines could be administered immediately after the end of treatment, and in cases of low-dose prednisone treatment, topical administration of steroids or physiological dose, vaccine could be administered. In infants of mothers receiving biological response modifiers during pregnancy, live vaccines are contraindicated until twelve months after receiving the last dose of the drug. Candidates for solid organ transplantation or HSCT should receive inactivated vaccines at least 2 weeks before transplantation and live viral vaccines up to 4 weeks before. After receiving HSCT and absence of GVHD, vaccines should be repeated. In house hold contact with immune compromised patients, OPV is prohibited and influenza, chicken pox and measles vaccines are recommended.

Keywords:

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Virus Detection and Laboratory Monitoring of Viral Hemorrhagic Diseases

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ARTICLEINFO

Orals

Keywords:
Laboratory detection, Viral hemorrhagic disease

ABSTRACT

Viral hemorrhagic fevers (VHFs) are serious illnesses caused by various viruses, including Ebola, Marburg, and Crimean-Congo hemorrhagic fever virus (CCHFV). Accurate and timely laboratory testing is crucial for diagnosis and management. Here are the most effective laboratory tests used for detecting VHFs: Molecular Tests, Serological Tests, Hematological Tests and Viral Culture. Effective management of VHFs relies on timely diagnosis through advanced laboratory techniques such as RT-PCR and serological testing. Continuous monitoring of clinical symptoms and laboratory parameters is essential for patient care and controlling potential outbreaks. Coordination with public health officials further ensures that appropriate precautions are taken to prevent the spread of these deadly viruses. The relationship between viral load (VL) and the severity of symptoms in patients with viral hemorrhagic fevers (VHFs) is an important aspect of understanding disease progression and patient management. Research indicates that higher viral loads are often associated with more severe clinical outcomes, although this correlation can vary depending on the specific virus and the timing of the measurement. Certain viral hemorrhagic fever (VHF) viruses exhibit a stronger correlation between viral load and symptom severity. Here are some key examples: Studies indicate that higher viral loads in Ebola virus infections correlate with increased severity of symptoms and higher mortality rates. Similar to Ebola, Marburg virus infections show a strong association between high viral loads and severe clinical outcomes. Also in CCHF, the timing of viral load measurement is crucial; higher loads are often detected during the early symptomatic phase, which can predict poor outcomes. In addition, higher levels of Lassa virus RNA in patients correlate with more severe clinical manifestations, including bleeding and multi-organ dysfunction.

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Infection Transmission in the Operating Room and Strategies for Its Control

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ARTICLEINFO

Orals

Keywords:
Infection transmission,
Operating room,
Infection control

ABSTRACT

Surgical site infection accounts for 20% of hospital-acquired infections. Prevention and careful control of infection is one of the most essential measures to ensure the safety of the patient undergoing surgery. The patient's skin and mucosa are internal sources; surgical instruments, personnel, and the operating room environment are considered external sources of infection transmission in surgery. One of the sources of infection transmission is the patient's skin and mucosa. Accurate prep and disinfection in accordance with the standard is effective in reducing infection transmission. Among the rules of prep is paying attention to the effective time for effectiveness (3 to 5 minutes) of the antiseptic agent. Controlling entry and exit and the number of people present in the operating rooms during surgery is important because at least 10,000 Skin Scale is released per person per minute. Keeping the entrance doors of the operating rooms closed, properly and promptly disinfecting the room before the start of the operation, between patient admission, end of shift, end of week and end of month, proper ventilation, standard temperature and humidity. Before using surgical instruments, it must be ensured that the instruments are placed in the sterilization process. Accordingly, the first stage of sterilization control, which is an indicator for checking the placement of devices in the sterilization process, is the control of the Exposure Indicator or external indicator. The next step is to ensure that the surgical packages and devices are sterilized correctly. Internal indicators (class 5 and 6) are one of the indicators for checking the sterilization of devices. Hand scrubbing is one of the ways to reduce the transmission of microorganisms. What is important in hand scrubbing is observing the time and mechanical principles of hand washing. In the timed washing method, the minimum hand washing time is 5 minutes, which should be considered. In relation to alcohol-based disinfectants, it is very important to observe the exact method of hand washing. Accordingly, according to the CDC recommendation, it is better to wash your hands first with Betadine Scrub and then use alcohol-based products for subsequent procedures.

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Accreditation and New Surveillance Techniques in Infection Prevention and Control

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ARTICLEINFO

Orals

Keywords:
Accreditation, Surveillance, Infection prevention and control

ABSTRACT

Accreditation is defined as a "self-assessment and external peer review process used by health and social care organizations to accurately assess their level of performance in relation to established standards and to implement ways to continuously improve the health or social care system". According to the Comprehensive Guideline of National Accreditation of Iranian Hospital, the performance of hospitals in the area of infection control in care and treatment components is examined and in three category threats of hospital infection including the health performance of care workers, the health conditions of the care environment and the health conditions of connections and equipment are assessed. Besides, indicators are measured the performance of the hospital based on the latest guidelines and communicated protocols. The qualitative goals of assessments are reducing the risk of healthcare-associated infections, reducing the risk of hand hygiene-related infections, use of medical equipment, supplies, and implants allowed with hygienic and sterile conditions and reducing the risk of infections related to environmental pollution. Meanwhile, the challenges in the establishment and evaluation of infection control and prevention standards in 2 categories including extensive prophylaxis (low and unrealistic rate of hospital infection in the initial disease process, care workers' inattention to hand hygiene standards based on false and low infection rates, the impossibility of monitoring the long-lasting clinical side effects of widespread prophylaxis and the traditional structure of health information, etc.) and stewardship and microbial resistance (inconsistency in stewardship and rational antibiotic prescription and consumption protocols, widespread microbial resistance, inconsistency in the effectiveness of stewardship and widespread microbial resistance and ...) are identified.

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The Challenge of Antimicrobial Stewardship Programs (ASPs)in Iran: (qualitative study)

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ARTICLEINFO

Orals

Keywords:
Challenge, Antimicrobial stewardship programs (ASPs), Iran

ABSTRACT

Introduction: Global attention to the threat and mitigation of antimicrobial resistance (AMR) has increased, with more research and funding dedicated to understanding the problem and optimal tools to mitigate it**.** Antimicrobial surveillance (AMS) programs promote the rational use of antimicrobials to help reduce the risk of AMR**.**AMR has been named as one of the top ten threats to public health in the world. This study aimed to explore the challenge of antimicrobial stewardship programs (ASPs) in Iran.

Materials and Methods: This qualitative study utilized a content analysis approach on 22 healthcare workers (HCWs) in Iran country in 2023-4. Data were collected through in-depth semi-structured interviews, with all interviews being recorded, transcribed verbatim, and utilized as the primary data for analysis. MAXQDA version 10 software was utilized for data management purposes.

Results: The most important main themes in the implementation of antibiotic stewardship in Iran included the health system, facilities and infrastructure, inter-sectoral collaboration, professional and external capacity.

Conclusion: Given the identification of problems in the implementation of the ASPs in Iran, proper planning should be carried out to reduce and eliminate them, along with monitoring and corrective action.

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A Survey of the Frequency of Healthcare-Associated Pneumonia in Children and Their Antibiotic Resistance Patterns in Shahid Motahari Educational Treatment Center in Urmia

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ARTICLEINFO

Orals

Keywords:
Pneumonia, Microorganisms, Children, Healthcare-associated infections

ABSTRACT

Introduction: After urinary tract infections, pneumonia is the second most common infection associated with healthcare. Ventilator-associated pneumonia not only increases mortality but can also prolong a patient's stay in the intensive care unit. The mortality rate in these patients has been reported to range from 24% to 50%, while if pneumonia is caused by high-risk pathogens, it can reach up to 76%. This study was conducted with the aim of investigating the frequency of healthcare-associated pneumonia in children and their antibiotic resistance patterns in Shahid Motahari educational treatment center in Urmia from 2017 to the first half of 2024.

Materials and Methods: To conduct this descriptive cross-sectional retrospective study, information was extracted from the INIS system regarding pediatric patients who developed clinical symptoms of pneumonia from the third day of hospitalization onward and had positive bronchial lavage culture results. This data was collected from the beginning of 2017 until the end of September 2024 and was analyzed. The information was introduced to the infection control unit by department liaisons after identification with a disease detection form and was entered into the INIS system following confirmation by a pediatric infectious disease specialist.

Results: The results showed that the percentage of hospital-acquired pneumonia is approximately (0.1%). Out of 108 bronchial lavage cultures that tested positive, 59.2% were male and 40.7% were female. Most of the patients (75%) were in the age range of 0 to 4 years. About 71.3% of pneumonias were ventilator-associated. The most common microorganisms causing pneumonia in children were *Acinetobacter* at (25.9%), *Pseudomonas aeruginosa* at (15.7%), and *Klebsiella Pneumoniae* at (6.5%). *Acinetobacter* (91.3%) and *Pseudomonas aeruginosa* (37.5%) showed the highest resistance to carbapenems. Approximately 42.8% of *Klebsiella Pneumoniae* strains had a high level of carbapenemase (KPC) enzyme.

Conclusion: The results indicate a high prevalence of multidrug-resistant (MDR) strains, significant resistance to carbapenems, and a high level of carbapenemase (KPC) enzyme in *Klebsiella Pneumoniae* strains. Considering the results of the research, reforming the antibiotic consumption pattern in healthcare centers can play a crucial role in reducing mortality and morbidity rates in children and preventing additional costs.

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Aseptic Techniques in Wound Management

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ARTICLEINFO

Orals

Keywords:
Wound, Aseptic, Hand hygiene, Dressing

ABSTRACT

Wound management by following aseptic principles plays an important role in reducing the risk of infection and faster wound healing. These principles generally include observing the correct hand hygiene technique, using appropriate masks and personal protective equipment, ensuring the sterility of the dressing equipment, creating a sterile environment and maintaining the sterility of the equipment and gases until the end of the dressing and correct disposal of contaminated waste, choosing the type Appropriate dressing and washing solution according to the type and extent of the wound, ensuring proper ventilation of the environment and preventing unnecessary movement of people during the dressing to prevent the settling of microbial agents suspended in the air on the wound, the correct technique of washing the wound from clean to contaminated area and Preparation of the wound bed and debridement of necrotic and infected tissues if necessary, cleaning the environment with disinfectants after dressing and creating a clean environment for the patient are important points of aseptic principles in wound management. Performing a wound culture in cases of suspected wound infection, according to the patient's appearance and systemic symptoms, in diagnosing the infection, and if necessary, choosing the appropriate type of antibiotic plays an important role in healing the wound. The sterile swab device is performed from the depth of the wound. The important points in performing wound culture are that before sampling, in order to minimize bacterial colonization, the surface of the wound should be washed with normal saline and, if necessary, the necrotic surfaces should be debrided. The surrounding of the wound and healthy skin It should be taken from the depth of the wound with a suitable antiseptic solution for disinfection and culture.

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Common Infectious Diseases in Nursing Homes: A Review of Epidemiology, Prevention, and Management

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Keywords:
Nursing homes,
Infectious diseases,
Elderly care

ABSTRACT

Nursing homes are critical environments for the care of elderly individuals, who are often more susceptible to infectious diseases due to age-related immunosenescence and comorbidities. This paper reviews the most common infectious diseases encountered in nursing homes, including their epidemiology, transmission dynamics, prevention strategies, and management approaches. Understanding these factors is essential for improving health outcomes in this vulnerable population. Results: Common diseases in nursing homes include urinary tract infections, pneumonia, pulmonary tuberculosis, pressure ulcers, bacteremia, acute infectious diarrhea, meningitis, and joint infections. Urinary tract infection is one of the most common infections in elderly women, presenting with symptoms such as frequent urination, burning sensation during urination, and fever and chills. Pneumonia, or lung infection, is another serious threat to the elderly, characterized by fever, cough, and shortness of breath. Pulmonary tuberculosis is one of the common infections in the elderly, typically manifesting with symptoms similar to respiratory infections and a weakened immune system in older age. Pressure ulcers are also prevalent among elderly individuals with limited mobility, especially when proper care is lacking. Bacteremia refers to the presence of bacteria in the blood and usually occurs following other infections. Acute infectious diarrhea is a major cause of mortality in the elderly, as it can quickly lead to dehydration. Meningitis, although less common, is associated with high mortality rates, and joint infections present as infectious arthritis in large joints such as the knee and hip. Recognizing these diseases and managing them properly in elder care facilities is crucial. Conclusion Infectious diseases remain a significant concern in nursing homes, necessitating comprehensive prevention and management strategies. By focusing on vaccination, hygiene practices, and appropriate medical interventions, healthcare providers can mitigate the impact of these diseases on vulnerable populations. Continuous education and training for staff, alongside robust infection control policies, are essential for safeguarding the health of nursing home residents.

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Comparison of Antimicrobial Efficacy of Different Sterilization Techniques in Reducing Healthcare-Associated Infections: A Systematic Review and Meta-analysis

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Keywords:
Antimicrobial efficacy, Healthcare-associated infections, Infection control, Sterilization methods, Surgical site infections

ABSTRACT

Introduction: Healthcare-associated infections (HAIs) pose significant challenges in patient safety, particularly in clinical settings such as hospitals and operating rooms. Sterilization and disinfection techniques are essential components of infection control, but the relative efficacy of different sterilization methods remains unclear. This systematic review and meta-analysis aims to compare the antimicrobial efficacy of various sterilization techniques in reducing HAIs. The primary objective is to evaluate which methods most effectively prevent the transmission of infectious agents in healthcare environments.

Materials and Methods: A comprehensive search of databases, including PubMed, Cochrane Library, Embase, and Web of Science, was conducted, covering studies from January 2000 to June 2023. Keywords such as "sterilization," "disinfection," "healthcare-associated infections," "antimicrobial efficacy," and "operating room" were used for the search. Inclusion criteria consisted of randomized controlled trials (RCTs), cohort studies, and case-control studies that compared at least two sterilization techniques and reported on HAI outcomes. Studies without quantifiable outcomes or those focusing on non-healthcare settings were excluded. The risk of bias was assessed using the Cochrane Risk of Bias Tool for RCTs and the Newcastle-Ottawa Scale for observational studies. Data were synthesized using a random-effects model, and heterogeneity was evaluated using the I^2 statistic .

Results: A total of 28 studies comprising 15,467 participants were included. The sterilization methods evaluated included steam sterilization, ethylene oxide, hydrogen peroxide plasma, and ultraviolet (UV) disinfection. Steam sterilization demonstrated the highest efficacy, reducing HAIs by 35% (95% CI: 25%-45%), followed by hydrogen peroxide plasma at 28% (95% CI: 18%-38%). UV disinfection was less effective, showing a reduction of 12% (95% CI: 5%-19%). Ethylene oxide had a variable impact with wide confidence intervals, suggesting inconsistencies across studies. Steam sterilization was consistently favored in reducing bacterial and fungal HAIs.

Conclusion: This meta-analysis indicates that steam sterilization remains the most effective method for preventing HAIs, outperforming hydrogen peroxide plasma, UV disinfection, and ethylene oxide. The findings support the prioritization of steam sterilization in high-risk healthcare settings, particularly in operating rooms. Future research should focus on standardizing sterilization protocols and exploring advancements in less effective techniques to enhance their efficacy .

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Comparison of the Effect of Medicinal Plants Oil Compound with Benzalkonium Chloride Solution as Handrubs on Bacterial Samples Isolated from The Hands of The Nurses of Shahid Dr. Rahnemoun Hospital, Yazd-Iran; 2019

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ARTICLEINFO

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Keywords:
Medicinal plant oil, Aloe vera oil, Lavender oil, Eucalyptus oil, Benzalkonium chloride solution, Hand sanitizer, Handrubs

ABSTRACT

Introduction: Hand hygiene is one of the most important factors in preventing the transmission of hospital pathogens. In recent years for disinfection; Much emphasis has been placed on the use of medicinal plant compounds. The present study was conducted with the aim of comparing the effect of a combination of three medicinal plants oil with benzalkonium chloride solution as a disinfectant on bacterial samples isolated from the hands of nurses at Shahid Dr. Rahmoon Hospital in Yazd - 2019.

Materials and Methods: The present study is a semi-experimental study that was conducted on 110 nurses working in the operating room, CSSD, and inpatient and special departments of Shahid Dr. Rahmonun Hospital in Yazd in 2019 using non-probability easy sampling. In the first group; A combination of Aloe vera, Eucalyptus and Lavender (Lavandula angustifolia) plant oils (30% concentration of each and 10% ethanol solvent) is used in liquid form, and in the other group, alcoholic hand sanitizer solution (containing 70% ethanol, benzalkonium 0.125% chloride, vitamin E, color and deionized dianyzed water) were used. Before and after the test in both groups; Cultivation of 3 types of bacterial species of *Escherichia coli*, *Staphylococcus aureus* and *Staphylococcus epidermis* was done by nurses. Also, the level of satisfaction of nurses regarding skin and respiratory sensitivities was also measured using a researcher's checklist with reliability and validity. Data were analyzed using SPSS22 software and descriptive and analytical statistical tests, t-test, paired t-test, Mann-Whitney, Fisher, chi-square and McNemar.

Results: Based on the findings, the use of alcoholic solutions was more effective in reducing hand bacterial agents than herbal compounds (P=0.002). Between two groups using herbal compounds and alcoholic solution; In terms of sensitivity and eczema, there was a significant difference (P=0.003) so that more frequency was reported in people who used alcoholic solution. However, no significant difference was observed in terms of skin dryness in the two groups (*P*: 0.05).

Conclusion: Based on the results of the present study; According to the environmental conditions of the hospital and the type of existing infections; It is recommended to use alcohol wipes. Despite this; it is recommended to carry out more research in

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Comparison of The Effect of Surgical Site Skin Preparation with Povidone-iodine Antiseptic at Two Different Temperatures on The Microbial Load and Surgical Site infection in Patients Undergoing Laparotomy

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Keywords:
Skin preparation, Patient, Povidone-iodine, Temperature, Microbial load, Surgical site infection

ABSTRACT

Introduction: Surgical site skin preparation is a meticulous process that aims to reduce the skin's microbial load and prevent post-surgical complications, including surgical site infection. Regarding the importance of determining the effect of the povidone iodine antiseptic temperature on its antimicrobial properties and performance in infection control, this study investigated the effect of povidone-iodine antiseptic at two different temperatures on microbial load and surgical site infection in patients undergoing laparotomy.

Materials and Methods: This single-blinded randomized controlled trial was conducted from April to July 2024 at Firouzgar and Hazrat Rasul Akram Medical Training Centers affiliated with Iran University of Medical Sciences. One hundred twenty-six patients who were undergoing elective laparotomy were randomly assigned to two groups: the control group (secondary preparation with povidone-iodine 10 percent at 22°C) and the intervention group (secondary preparation with povidone-iodine 10 percent at 35°C). In both groups, the two-stage surgical skin preparation method (primary and secondary preparation) was used, and the primary preparation was performed using 7.5 percent povidone-iodine. Microbial cultures were taken before skin preparation, after primary preparation, and after secondary preparation. Also, the surgical site infection rate was investigated using a researcher-made form. The data was analyzed using SPSS version 16 and Kolmogorov-Smirnov, Wilcoxon signed rank, Mann-Whitney U, and Fischer's exact tests. The level of significance was P0.05.

Results: The microbial load after secondary skin preparation in the group of 10 percent povidone-iodine at 22°C was significantly reduced (P=0.001). Also, the microbial load after secondary skin preparation in the group of 10 percent povidone-iodine at 35°C was significantly reduced (P=0.003). However, the microbial load before and after secondary skin preparation was not significantly different between the two groups of 10 percent at 22°C and 35°C (P=0.437). The Surgical site infection rate was not significantly different between the two groups (P=0.164).

Conclusion: Povidone-iodine 10 percent significantly reduced microbial load at both temperatures, with no significant differences in microbial load or surgical site infection rate between the two groups. Using povidone-iodine at 22°C is recommended for common surgical site skin preparation.

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Comparison of The Efficiency of Brush and Sponge Used for Surgical Hand Scrub on Microbial Load and Antimicrobial Residual Effect

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Keywords:
Surgical hand scrub; Brush; Sponge; Microbial load; Antimicrobial residual effect

ABSTRACT

Introduction: Surgical hand antisepsis is the most important and easiest step that must be done to prevent surgical site infection. Hand antisepsis reduces the level of microorganisms on the hands to a minimum. Despite the various methods introduced for surgical hand antisepsis, there is no consensus on a specific method. The purpose of this study was to compare hand antisepsis using a brush and sponge in terms of the microbial load on the skin of the hands and the antimicrobial residual effect.

Materials and Methods: This study was a randomized clinical trial conducted at Iran University of Medical Sciences' teaching hospitals. The research sample comprised 50 surgical technology students, who were randomly divided into two groups of control and intervention. The control group performed surgical hand scrub with a brush and povidone iodine, and the intervention group performed surgical hand scrub with a sponge and povidone iodine. Microbial samples were taken from the dominant hand of the samples using a sterile swab at three stages: before surgical hand scrub, immediately after surgical hand scrub, and 2 hours after surgical hand scrub. The research tools included a demographic form and a microbial load and antisepsis method form. The Wilcoxon test was used for comparison of microbial load between the 3 stages of the study, and the Mann-Whitney U test was used for comparison of microbial load and antimicrobial residual effect between the 2 groups. A P value less than 0.05 was considered to be statistically significant.

Results: Both surgical hand antisepsis methods with brush and sponge, resulted in a statistically significant decrease in microbial load immediately after surgical hand scrub (Respectively P=0/001 and P=0/002). Microbial load in the control group was significantly lower than the intervention group immediately after surgical hand scrub (P=0/034). There were no statistically significant differences in antimicrobial residual effect between the two groups (P=0/058).

Conclusion: Considering that the microbial load in the control group was lower immediately after surgical hand scrub compared to the intervention group, it is suggested to use a brush and povidone iodine for surgical hand antisepsis.

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Comprehensive Comparative Analysis of Single-Use Sterile Surgical Instruments versus Reprocessed Devices in Reducing Surgical Site Infections: A Meta-Analysis of Safety, Efficacy, and Cost-Effectiveness in High-Risk and Elective Surgeries

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Keywords:
Infection control, Reprocessed surgical instruments, Single-use instruments, Surgical site infection, Sterilization

ABSTRACT

Introduction: Surgical site infections (SSIs) remain a significant concern in both elective and high-risk surgeries, contributing to increased morbidity, prolonged hospital stays, and higher healthcare costs. One of the key factors influencing the rate of SSIs is the type of surgical instruments used, with ongoing debates over the safety, efficacy, and cost-effectiveness of single-use sterile instruments versus reprocessed devices. The objective of this meta-analysis is to compare the effectiveness of these two approaches in reducing SSIs and examines their safety and economic implications in various surgical settings.

Materials and Methods: A comprehensive literature search was conducted across PubMed, Cochrane Library, and Embase databases from January 2000 to December 2023, using keywords such as "single-use surgical instruments," "reprocessed devices," "surgical site infections," "safety," "efficacy," and "cost-effectiveness." Studies included were randomized controlled trials (RCTs) and observational studies comparing single-use and reprocessed instruments in terms of SSI rates. Inclusion criteria focused on surgeries classified as elective or high-risk. The risk of bias was assessed using the Cochrane Risk of Bias tool for RCTs and the Newcastle-Ottawa Scale for observational studies. Meta-analysis was conducted using a random-effects model, and results were synthesized through forest plots and subgroup analyses.

Results: A total of 35 studies with 22,500 participants (18 RCTs, 17 observational studies) were included. Single-use instruments significantly reduced SSIs compared to reprocessed devices (RR: 0.75, 95% CI: 0.65–0.88, p0.001). High-risk surgeries showed a greater reduction in SSIs (RR: 0.68, 95% CI: 0.56–0.81), while elective surgeries had a smaller effect (RR: 0.85, 95% CI: 0.70–1.02). Contamination rates were lower with single-use instruments (OR: 0.50, 95% CI: 0.40–0.65). Despite higher initial costs, long-term savings from reduced infection-related complications were observed, especially in high-risk surgeries **.**

Conclusion: This meta-analysis suggests that single-use sterile instruments are superior in reducing SSIs, particularly in high-risk surgeries, with enhanced safety profiles. Although reprocessed devices offer cost benefits, the higher risk of infection may offset savings. Future research should focus on optimizing cost strategies while maintaining safety and efficacy in surgical practices**.**

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Determining the Level of Knowledge of Nurses Working in Medical Centers Affiliated to Guilan University of Medical Sciences about Dengue Fever and Its Related Factors in 2024

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ARTICLEINFO

Orals

Keywords:
Dengue fever, Knowledge, Nurses, Guilan University of Medical Sciences

ABSTRACT

Introduction: Dengue is the most common life-threatening viral disease transmitted by mosquitoes in humans. Iran is strategically at risk of this disease in the region. The present study was conducted to determining the level of knowledge of nurses working in medical centers affiliated to Guilan University of Medical Sciences about dengue fever in 2024.

Materials and Methods: A descriptive-cross-sectional study was conducted using a researcher-made questionnaire with 25 MCQ which was provided to the nurses through the link. Data analysis was done using SPSS Ver17 software and chi-square and percentage frequency statistical methods.

Results: Out of a total of 940 nurses participating in the study, 8.9% were male and 91.1% were female, most of them were in the age group of 25-35 years (46%), and, had a bachelor's degree (92.1%). The majority of the participants were working in government centers (71.1%) with an average work experience of 12.37±7.5 years, formal (52.4%) and in rotating shifts (72.8%). by counting the score of 15 as a passing score in the test, it was found that only 39.4% obtained the passing score in the knowledge test of nursing care in dengue fever. Age group, type of employment, amount of overtime, history of previous training courses, type of work shift, and the type of public or private center had a significant relationship with the level of knowledge of nursing care in dengue fever (P0.001). The present study evaluated the level of knowledge of nurses working in affiliated centers of Guilan University of Medical Sciences as lower than average However, the study of Nikookar et al. showed that health care workers in Mazandaran had good knowledge in clinical management and prevention of this disease.

Conclusion: The lack of knowledge of nurses in the present study can be caused by the wide range of nursing interventions with various criteria in disease control. Holding active and diverse educational programs can have a significant impact on raising the level of awareness of nurses in case of an outbreak of the disease in Guilan province, and we suggest repeating the mentioned courses in cooperation with the health deputy of the university to empower nurses.

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Early Warning System and Notification in Disasters and Epidemics

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ARTICLEINFO

Orals

Keywords:
Early warning system,
Crisis management,
Disaster information dissemination

ABSTRACT

One of the most important aspects of crisis management is warning people about threats. During an epidemic, the early warning system, by providing timely and effective information from the Ministry of Health, helps prevent, reduce risk, and increase preparedness for an effective response to those at risk. Method: The aim of this review study is to describe the early warning system and information dissemination system in emergencies and epidemics and its components. Findings: The early warning system can issue alerts regarding the likelihood of an epidemic and disease outbreak before the crisis occurs. The four key and important components of a complete and effective early warning system include risk knowledge, monitoring and warning, community dissemination, and finally, local capabilities to respond to warnings. Technical knowledge involves the systemic collection of data to analyze and evaluate the epidemic and existing capacities. Technical monitoring and the establishment of warning services for epidemics aim to identify and detect community risks. The warning announcement should also be understandable to individuals or communities at risk, and the final component, by creating preparedness and public education in the community to respond appropriately to disease threats, capacity building at the national and local levels, and enhancing the capabilities of the at-risk community, can reduce the epidemic's impact on society. This system, in addition to protecting human lives, prevents the loss of national assets and the diversion of resources from the path of development. Conclusion: The early warning system should be part of the national program for reducing the destructive impacts of disasters and minimizing vulnerability to epidemics and pandemics. This system, through a chain of understanding and mapping the epidemic, monitoring and forecasting near-future events following the epidemic, processing and disseminating understandable warnings for policymakers and the public, and implementing appropriate and timely actions in response to these warnings, can save the lives of thousands of people from illness and death.

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Effect of Teaching Standard Precautions Based on Kirkpatrick's Model on the Knowledge and Practice of Intensive Care unit Nurses

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ARTICLEINFO

Orals

Keywords:
Standard precautions, Education, Intensive care unit nurses, Nurses

ABSTRACT

Introduction: Educating nurses as nurses on the front line of patient care is very important to ensure that they have the appropriate knowledge and skills in infection prevention and control. The present study aims to evaluate the effect of teaching standard precautions for the infection prevention and control based on Kirkpatrick's model on the knowledge and practice of intensive care unit nurses.

Materials and Methods: This experimental study was conducted on 70 final-year intensive care unit nurses. They were randomly assigned to the intervention and control groups. Data collection tools included a demographic form and a questionnaire based on Kirkpatrick's evaluation criteria. For the intervention group, the educational program was presented based on Kirkpatrick's model, while for the control group, an educational booklet was provided to the nurses. After the educational program, its effectiveness was evaluated at three levels. The amount of knowledge was assessed using a researcher-made test before and after the program. To evaluate the practice, an observation checklist was used which before and one month after the intervention. Finally, the results were analyzed using independent t-test.

Results: The Mean knowledge and practice of nursing students increased significantly after the educational program.

Conclusion: Due to the effectiveness of educational program for intensive care unit nurses, it seems that Kirkpatrick's model can be a suitable approach to evaluate the effectiveness of health education programs.

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Emerging and reemerging diseases in Children

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Keywords:
Emerging disease-
Reemerging disease-
Children

ABSTRACT

Avian influenza from 2003 to 2021, there were 193 children infected with the H5N1 virus, with a CFR of 53%. Avoidance of exposure to infected live or dead poultry is an important preventive measure. Prepandemic vaccine production and stockpiling are important preventive measures. The AS03-adjuvant subvirion H5N1 avian influenza vaccine is approved for use in the EU and the United States. The Middle East respiratory syndrome, MERS-CoV first was identified in Saudi Arabia in 2012 with very high case fatality rates. MERS-CoV in children usually occurs from household contacts from human-to-human transmission. There are vaccines in development targeting viral spike proteins, for example, ChAdOx1 MERS, a simian adenovirus-vector vaccine expressing full-length spike surface glycoproteins. Dengue is public health priority, with more than 5.2 million case reports in 2019. Prevention in children includes mosquito bite prevention with repellents, bed nets treated with permethrin, and CYD-TDV is a live, attenuated recombinant tetravalent vaccine with a yellow fever 17D backbone licensed in 2015. Vaccination is recommended for persons aged 9 to 45 years with previous infection. The dengue vaccine also can be considered in areas with dengue seroprevalence rates of greater than 80% by age 9 years. Chikungunya is an emerging disease that has spread to more than 60 countries throughout Asia, Africa, Europe, and the Americas. Prevention is focused on mosquito bite prevention and vector control. Chikungunya vaccine development has progressed to phase 3 for the VLA1553, a monovalent single-dose, live, attenuated vaccine. Ebola is a zoonotic disease affecting mainly West Africa Human-to-human transmission occurs via direct contact with blood, secretions, or other bodily fluids. Children usually are infected from household contacts. Ervebo, a replication-competent, live, attenuated vaccine is approved for use by the FDA in the prevention of EVD caused by the EBOV species in adults aged greater than or equal to 18 years. Ring vaccination strategies were used successfully during the 2016 outbreak in Guinea.

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Ethical and Legal Challenges in Caring for Patients with Infectious Diseases

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ARTICLEINFO

Orals

Keywords:
Infectious diseases,
Ethical challenges,
Patient rights

ABSTRACT

The infection of patients with infectious diseases creates complex challenges in healthcare that are ethically and legally significant. This study reviews the ethical and legal challenges in caring for patients with infectious diseases and introduces possible strategies to mitigate these challenges. This research was conducted as a review of references and studies related to ethical and legal challenges in caring for patients with infectious diseases. Findings: A review of the studies shows that the major challenges associated with caring for patients with infectious diseases include mandatory isolation (restrictions on individual freedom, psychological effects of isolation, lack of respect for patient dignity), lack of transparency in patient information (failure to provide accurate information about the patient's condition, failure to answer patient questions), breaches of confidentiality (disclosure of patient information to unauthorized individuals, failure to obtain informed consent for information disclosure), and social stigma and discrimination (economic, social, and cultural challenges). Ethical care for patients with infectious diseases requires a careful balance between individual patient rights and the responsibilities of the community and the healthcare system. Accordingly, it is recommended to provide ethical care training to healthcare staff and develop clear protocols to address these cases.

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Examining the Performance of Nurses at Shahid Hashminejad Hospital in Mashhad Regarding the Insertion of Urinary Catheters and Compliance with Infection Control Instructions to Prevent Urinary Infections

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ARTICLEINFO

Orals

Keywords:
Urinary infection, Infection control, UTI, Nursing

ABSTRACT

Introduction: Urinary tract infection is one of the most common hospital infections. In addition to increase patient hospitalization, costs, microbial resistance, it could increase the risk of sepsis and mortality. The purpose of this study is to investigate the extent of compliance with infection control guidelines in urinary catheter placement.

Materials and Methods: The present study is descriptive-analytical including 102 nurse staff of Hasheminejad hospital during the second half of 2023. The instrument used was the checklist published by Mashhad University of Medical Sciences, whose validity and reliability have been confirmed. This checklist contains 40 sequential steps that was completed by the infection control supervisor. The endpoint outcome was compliance versus non-compliance.

Results: From the studied sample, 76.1% were women, 54.9% were married, 98.3% were experts, 68.2% were officially and contractually employed, and 61.8% were working shifts. The mean age of the nurses was 30±5 and their work experience was between 2 and 13 years. The evaluation of compliance was done in intensive care units (ICUs), surgical, medical and emergency departments. As primary outcome, there was 63.7% compliance and 32.3% non-compliance. Compliance to infection control guideline was 75% in ICUs, 68% in surgical, and 70% in medical departments. In emergency rooms, compliance was 42%. Out of 32.3% of non-compliance, the most cases of non-compliance are related to disinfecting the anus area in the last stage of cleaning (3.4%), inappropriate fixation of the catheter (3.0%), lack of the Foley catheter balloon control before using (2.9%), and non-use of sterile gauze on the pubic symphysis area (1.7%).

Conclusion: one of the most important nursing management initiatives in hospital infection control is the institutionalization of preventive measures in case of infection. It is necessary to plan workshop and practical trainings in the field of disinfecting the anus area in the last stage of cleaning, proper fixation of the catheter, checking the balloon of the Foley catheter before use and using the perforated catheter.

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Frequency Evaluation of Nosocomial infections Among Patients in Intensive Care Units at Ghaem Hospital during 1402 - Mashhad University of Medical Sciences

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ARTICLEINFO

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Keywords:
Nosocomial, Infections, Frequency, Intensive care unit

ABSTRACT

Introduction: Nosocomial infections in intensive care unit (ICU), have high social economic costs and it is a major problem in hospitals worldwide. Published reports from various ICU departments, including reports from developing countries, Nosocomial infections are associated with increased mortality, ICU length of stay, and hospital costs. In this research, we decided to investigate the prevalence of common organisms in the special departments of Ghaem Hospital of Mashhad University of Medical Sciences in 1402.

Materials and Methods: This study is a retrospective descriptive study about the infections identified in adult ICUs in 1402. In this study, 9 intensive care units in the target hospital were studied. This study only studied patients who had clinical features related to invasive infections. Registration information was collected based on the questionnaire designed by the NNIS system. Data were analyzed using SPSS version 21 statistical software.

Results: The most common organisms isolated were Klebsiella pneumoniae (30.5%), Acinetobacter (29.6%), Pseudomonas (17.3%), Escherichia coli (5.8%), and Enterococcus (5.1%), respectively. Acinetobacter was the most prevalent in surgical intensive care units and Klebsiella pneumoniae in internal intensive care units. Gram-negative microorganisms were identified more frequently than gram-positive microorganisms on culture.

Conclusion: This study provided important basic data regarding the frequency of infection-causing organisms in intensive care units, which can be considered in the management of hospital infections. The Nosocomial infections are caused by a wide range of pathogens. There are several risk factors that directly affect patients, such as poor nutrition and hyperglycemia. The prevalence of these infections in intensive care units compared to other departments is due to the fact that ICU patients have severe diseases, the duration of their hospitalization is usually higher than the average of other departments, and it is common to use invasive interventions during hospitalization period. There are known considerations that reduce the problem of nosocomial infection in the ICU. Prevention of antimicrobial resistance and focusing on adequate antimicrobial therapy and source control are important to optimize patient management and outcomes. Meanwhile, hand hygiene, environmental cleanliness, and appropriate hospital personnel can affect ICU infection rates.

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Innovative Strategies and Compliance Challenges in Surgical Hand Preparation for Infection Control

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ARTICLEINFO

Orals

Keywords:
Surgical hand preparation, Operating room, Infection control, Hand hygiene

ABSTRACT

Introduction: Surgical site infections (SSIs) represent a substantial portion of healthcare-associated infections (HAIs), increasing patient morbidity and healthcare costs. Ensuring optimal hand hygiene in the operating room (OR) is essential for preventing SSIs. Traditional surgical hand scrubbing with antimicrobial soap and water is commonly used, while alcohol-based hand rubs (ABHRs) offer a time-saving alternative. This review evaluates challenges related to surgical hand scrubbing in the OR, compares the effectiveness of ABHRs and traditional scrubbing, and explores innovative strategies to enhance compliance with hand hygiene protocols.

Materials and Methods: A systematic review was conducted using PubMed, Scopus, and Embase databases. Studies addressing compliance, technique, and effectiveness in SSI prevention for both ABHR and traditional hand scrubbing were included, along with recent research on advancements in hand hygiene practices.

Results: Moderate-quality evidence supports the equivalency of ABHRs and traditional scrubbing for SSI prevention, although barriers such as time pressure, skin irritation, and inadequate training affect compliance with both methods. Innovative solutions, including self-cleaning scrub stations, moisturizing antiseptics, and automated compliance monitoring, have demonstrated potential in improving adherence to hygiene protocols.

Conclusion: Effective surgical hand preparation may be achieved through either method, provided compliance challenges are addressed. Combining traditional approaches with new technologies, enhanced training, and resource optimization can improve adherence, reduce SSIs, and enhance patient safety in the OR.

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Investigating the Effect of Implementation of Blood Infection Prevention Packages in All Inpatient Departments of Dr. Ali Shariati Hospital in Mashhad in the First and Second Quarter of 2023

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ARTICLEINFO

Orals

Keywords:
The "fundamental catheterization" checklist, Sepsis, Nosocomial infection

ABSTRACT

Introduction: Nosocomial infection or infections related to care/health services is of considerable importance and is a common problem in all countries of the world, especially developing countries. These infections are a constant threat to the effective and correct functioning of health service providers and can lead to a decrease in the quality of health services. Nosocomial infection imposes a heavy economic burden on patients and health service providers in addition to length of hospitalization, increase in microbial resistance (AMR), and increase in mortality and disease complications.

Materials and Methods: The present study was conducted using a cross-sectional descriptive method and using the sepsis prevention care checklist on patients hospitalized in all the inpatient departments of Dr. Shariati Hospital in Mashhad. The results of nosocomial sepsis (BSI) in the first quarter of 2024 before the training and implementation of the "fundamental catheterization" checklist were compared with the second quarter of 2024 after the training and implementation of the aforementioned checklist.

Results: The results of the research showed that sepsis in the inpatient departments decreased from 12 cases in the first quarter of 2024 to 7 cases in the second quarter following the "fundamental catheterization" checklist. Discussion and conclusion:

Conclusion: The results of this study showed that by performing the "fundamental catheterization" checklist, which includes observing hand hygiene before the operation, preparing equipment before performing the work, proper disinfection of the catheter placement site such as angiocath, and educating the patient about the signs of infection. It significantly reduces the possibility of sepsis in patients.

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Investigating The Effect of Teaching Infection Control standards to Nursing Personnel on The Incidence of Phlebitis Related to Peripheral Venous Catheters in Cardiac Patients Hospitalized in The Special Departments of Dr. Heshmat Rasht Heart Training Center

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ARTICLEINFO

Orals

Keywords:
Education, Infection control, Peripheral venous catheter, Phlebitis

ABSTRACT

Introduction: access to the intravascular system for fluid administration is the most common invasive procedure. It also brings many complications, the most common of which is phlebitis. Therefore, this study was conducted with the aim of evaluating the effect of compliance with infection control standards during intravenous treatment by nursing personnel on the incidence of phlebitis related to peripheral venous catheters in hospitalized cardiac patients.

Materials and Methods: This research is semi-experimental research that was conducted on 600 patients with myocardial infarction hospitalized in CCU departments. The samples were selected by available sampling method. The location of the peripheral catheter was checked every 12 hours for the presence of phlebitis symptoms in two phases of 3 months. All nurses of CCU departments were trained in infection control standards. By using the data collection form, the phlebitis criterion of the IV Nursing Association was collected. The incidence of phlebitis before and after training was compared and analyzed using SPSS 21 statistical software. It should be noted that in both groups, the samples were homogenized in terms of age, placement location, underlying disease, and type of injection solution.

Results: In the first stage, 100 cases out of 300 hospitalized patients in CCU departments and 58 cases out of 300 hospitalized patients developed phlebitis in the second stage, and there was a significant difference between the amount of phlebitis before and after the intervention (p=0.05).

Conclusion: The need to emphasize and continue training for personnel is felt, and supervision and training of personnel should be done in a written and continuous manner by the authorities.

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Personal Protective Equipment and Hemorrhagic Fever

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ARTICLEINFO

Orals

Keywords:
Hemorrhagic fever, Personal protective equipment, Syndromic system, Standard precautions, Emerging diseases, Recurrent diseases

ABSTRACT

There is a difference between treatment groups in the proper treatment of patients suspected of hemorrhagic fever, which is lack of awareness or insufficient attention to the principle of standard precautions, syndromic system, appropriate use of personal protective equipment and importance of timely reporting of occupational exposure. The principle of standard precautions is the potential contamination of each person's blood and discharge which insufficient attention is one of the causes of disruption in the use of personal protective equipment. Also, one of the cases of Syndromic System violation is the diagnosis of the disease, the mere sight of a group of symptoms, regardless of other patient information, especially in medical history , such as occupation, travel history or contact with the passenger, history of bites or contact with the animal, history of food or special substance consumption, etc. The two cases above cause a disruption in the work process, neglect of occupational exposure, delay in reporting or non-reporting of exposure. The reason for these cases is the insufficient or inappropriate training time of treatment groups and single - dimensional focus on the disease instead of a comprehensive focus on the patient. With the rise of emerging and recurrent diseases frequent training is essential in all groups and not just the Infectious or Medical group, until there is a change in the behavior of treatment groups in relation to patients of any non-contagious and contagious, in any location such as the operating room or ward in such a way that in dealing with the possibility of contact with the blood and discharge of each person the use of minimal personal protection means gloves and masks is clearly visible.

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Prevalence of Predominant Germs and Microbial Resistance of Positive Cultures in Hospitalized Patients in a Selective Hospital of Mashhad

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Orals

Keywords:
Microbial germ, Microbial resistance, antibiotics, infection, Hospital

ABSTRACT

Introduction: Microbial resistance is a great threat to the health system and hospital care because it has compromised therapy and requires constant monitoring of emerging patterns. Microbial resistance is also one of the major causes of increased morbidity and mortality in hospitalized patients. Our study aimed to determine the predominant germs and microbial resistance of positive cultures in hospitalized patients.

Materials and Methods: The present study was cross-sectional research conducted in a selected general hospital in Mashhad city for 6 months from March to September 2024. Demographic data and infection details through a checklist were collected. The data were analyzed with EXCEL software.

Results: In this period, overall, 1072 samples were cultured in the microbial laboratory, of which 209 cases (19.49%) were positive. The highest number of cultures performed was related to the operation room and gynecological surgery department. The most positive cultures were related to the gynecological surgery, operating room, internal ward respectively. The most positive cultures were respectively related to urine (36.12%), sputum (21.05%), and wound (13.87%) samples. The most detected germs were *E. coli*, *Klebsiella*, and *Pseudomonas aeruginosa* respectively. The highest microbial resistance was related to Cephalexin, Nalidixic acid, and Cefixime respectively.

Conclusion: The high rate of positive cultures in hospitalized patients, as well as microbial resistance, is a very worrying issue for healthcare providers, and it seems that specific strategies should be implemented to prevent or moderate these concerns.

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Prevention and Control of Infection in Cardiac Patients

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ARTICLEINFO

Orals

Keywords:
Cardiac patient,
Infection, Prevention

ABSTRACT

Cardiac patients are especially vulnerable to infections include: patients undergoing cardiac implantable electronic devices (CIED), cardiac surgery, patients at risk for infective endocarditis and patients with heart failure. Cardiac implantable electronic devices are life-saving treatments for cardiac conditions including pacemakers, Cardiac resynchronization therapy (CRT) and Implantable cardioverter defibrillators (ICD). Risk factors for developing CIED infections can be categorized as patient-, procedure-, or device-related. The strategies to prevent CIED infection include proper skin preparation, perioperative antibiotics and reduction of hematoma formation. Cardiac surgical procedures carry a particular high risk of postoperative infection, with infection incidence rates ranging from a reported 3.5% and 26.8% in cardiac surgery patients. The most common infections are sternal wound and graft harvesting site. Preoperative prevention of infection is reducing preoperative risk factors such as: obesity, hypoalbuminemia, abnormal glucose levels, smoking and *Staphylococcus aureus* carriage. For the decolonization of *S. aureus* carriers prior to cardiac surgery, nasal mupirocin administration together with baths using chlorhexidine-based agents is recommended. Perioperative management involves antibiotic prophylaxis, surgical site preparation, topical antibiotic administration and the maintenance of normal glucose levels. Infective endocarditis is an uncommon infectious disease with an annual incidence ranging from 3 to 7 per 100 000 person-years in the most contemporary population surveys. The most common risk factors for developing Infective endocarditis include: patients with valvular heart diseases, prosthetic heart valve, congenital heart diseases and heart transplant recipients. Infective endocarditis might be prevented by antibiotic prophylaxis before dental procedures and other surgeries. Heart failure related infections may be acquired in the community or during hospitalization; about 15.3% of hospitalization for heart failure were related to pneumonia or respiratory tract infection. These patients are particularly susceptible to respiratory infections due to several factors, including weakened immune systems, compromised lung function, and increased fluid retention. The strategies to prevent infection includes: vaccination (Influenza and Pneumococcal vaccines), avoiding crowds and smoke, hand hygiene and medication management. Conclusion: Preventing infection in cardiac patients requires a multifaceted approach. Cardiac patients and healthcare providers can reduce the risk of infection by following the strategies of preventing infection.

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Risk Factors for The Occurrence of Wounds Infection

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ARTICLEINFO

Orals

Keywords:
Risk factor, Wound, Infection

ABSTRACT

Introduction: Wound infection causes impaired wound healing and increased morbidity. Early identification of wound infection is crucial to improve the health and well-being of patients. Identifying the risk factors for the occurrence of an infected wound can help in the prevention of infection. One Meta-analysis study showed that Men, immunocompromised individuals and probably patients with diabetes have a higher risk for surgical wound infection. Factors affecting wound healing (Local and Systemic) can also be effective in the occurrence of infection. Local factors are movement of surrounding joints, diminished blood supply, presence of foreign body, dead tissue, suture material and talcum powder. Wrongly done scraping, very tight bandage especially in vascular insufficiency, decreased venous return, excessive use of irritant local medications, and edema, all these factors also interfere in healing. Wound hypoxia leads to reduced antimicrobial activity, reduced cellular metabolism and proliferation, reduced angiogenesis. Increase in oxygen supply to wound increases collagen production and its tensile strength. Systemic Factors Stress results in the deregulation of immune system and thus delays healing. Sex hormone is also important as, compared to aged females; aged males have been shown to have delayed healing of acute wound. Hereditary healing disorder, jaundice, uremia, obesity, medication (glucocorticoids, NSAIDs, chemotherapeutic drugs), venous insufficiency, smoking (Nicotine probably interferes with oxygen supply by inducing tissue ischemia due to vasoconstrictive effect), all these affect healing of wound. Poor cardiac function and hypoproteinemia also interfere in wound healing. Other factors that effect to wound infection are Size, Depth, Edges, Necrotic Tissue Type, Necrotic Tissue Amount, Exudate Type and Amount, Skin Color Surrounding Wound, Peripheral Tissue Edema & Induration, Granulation Tissue and Epithelialization.

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The effect of application-based training on hand washing behavior of children with leukemia

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ARTICLEINFO

Orals

Keywords:
Education, Hand washing behavior, Children, Leukemia

ABSTRACT

Introduction: Leukemia is a dangerous disease that affects the body's immune system, and affected children are highly susceptible to infections due to a weak immune system. One of the most important ways to prevent infection is to wash your hands correctly and continuously. However, teaching health concepts to children, especially children with chronic diseases, can be challenging. In this regard, the use of educational applications with suitable and attractive features can be considered as a suitable solution for improving the health performance of children with leukemia in the field of hand washing.
Materials and Methods: This semi-experimental study was conducted on 70 children with leukemia in Imam Ali Zahedan Hospital in 1402. The samples were randomly divided into intervention and control groups. The intervention group used the application made by the researcher for 30 days. The data collection tool in this study was a questionnaire. And at the end of the research, the collected data was analyzed by SPSS software version 27.
Results: The independent t-test did not show a significant difference between before and after the intervention in the control group, but it showed a significant difference in the test group, and this difference was observed in all dimensions of hand washing behavior. (p=0.001).
Conclusion: The present study showed that application-based training can effectively improve the hand washing behavior of children with leukemia. These results show that the use of educational applications with suitable and attractive features for children can be used as a successful method in changing health behavior in children with leukemia.

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The Effect of Education on the Website of Disease Recurrence in Children with the Disease

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ARTICLEINFO

Orals

Keywords:
Education, Recurrence of infection, Urinary tract infection

ABSTRACT

Introduction: Urinary tract infection is one of the most common diseases in children, which can cause serious consequences such as kidney damage, recurrence of infection and the need for frequent hospitalizations. Recurrence of urinary tract infection in children increases treatment costs, parents' anxiety and decreases the child's quality of life. Education is known as one of the important strategies in preventing the recurrence of UTI. Education is known as one of the important strategies in preventing the recurrence of UTI. However, traditional methods of education face limitations, so with the advancement of technology, the possibility of using web-based education is proposed as an effective solution for educating these children.

Materials and Methods: This semi-experimental study was conducted on 70 children with office infection referred to Zahedan Hospital in 1402. The samples were randomly divided into intervention and control groups. The intervention group used the website created by the researcher for 30 days. The data collection tool in this study was a questionnaire. And at the end of the research, the collected data was analyzed by SPSS software version 27.

Results: Independent t-test did not show a significant difference between before and after the intervention in the control group, but it showed a significant difference in the test group (p0.001).

Conclusion: The present study showed that web-based education can be effectively used to prevent the recurrence of urinary tract infections in these children. The results of the study showed that after receiving web-based training, children and their parents have a better understanding of the risk factors of UTI recurrence, prevention methods, and the importance of follow-up.

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The Importance and Strategies of Patient Education in Order to Control Hospital Infections

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ARTICLEINFO

Orals

Keywords:
Hospital Infections-
Patient Education-
Nurse.

ABSTRACT

Hospital infections account for a significant role in hospital morbidity and mortality. In addition, they impose a lot of costs on the health care system of the society. On the other hand, these cases lead to a decrease in the level of patients' satisfaction with the quality of service provision. In this regard, patient education occupies a special place in order to reduce hospital infections. Patient education is one of the basic aspects of patient care and one of the main duties of nurses. The correct implementation of the process of patient education, affect the negative consequences that are mainly caused by the insufficient explanations of the specialists regarding the signs and symptoms of the disease, such as forgetting the time to visit the doctor, poor self-care, delay in accessing the necessary medical care, re-hospitalization and issues like this. Patient education is a process that needs to be implemented within the framework of the relevant standards, and each step of this process has its own standard. The steps of process of patient education are: assessment of needs and its registration, formulation of goals, selection of teaching method, evaluation and registration of patient education. Also, patient education includes several parts, which are: general training when the patient enters the hospital, training to the patient during hospitalization, training during discharge and training after discharge. In this regard, the comprehensive guidelines for patient education emphasize the following strategies at this time: assessment of motivation, examination of the patient's ability and willingness to learn, assessment of educational needs and inclusion in the patient's hospital chart, setting goals of patient education based on priorities, selection of appropriate educational strategies, patient education program based on group training, informing patients about the activities of non-governmental organizations, religious institutions and associations for patients.

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The Relationship between Infection and Stroke Readmission: A Systematic Review and Meta-analysis

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ARTICLEINFO

Orals

Keywords:
Risk factors, Readmission, Stroke, Cerebrovascular accident, Infection.

ABSTRACT

Introduction: Accurately identifying the relationship between infection and the readmission of stroke patients leads to emphasis more the corresponding strategies. The present study was conducted to determine the relationship between infection and readmission in stroke patients.

Materials and Methods: This systematic review and meta-analysis is based on PRISMA 2020 guidelines. Searching for articles in valuable databases PubMed, Web of Science, CINAHL, Scopus and Google scholar search engine using keywords: stroke, readmission/recurrence/re-hospitalization, and infection was carried out until May 2024. The rate of readmission due to infection as well as the Odds Ratio (OR) of the infection was calculated using the random effects model and Comprehensive Meta-Analysis V.2 software.

Results: Based on the reviewed studies, the 30-day readmission rate of stroke patients due to infection ranged from 6.5% to 30.0% and the one-year readmission rate ranged from 5.1% to 24.5%. Also, the analysis showed that infection is an important risk factor in the readmission of stroke patients based on cohort studies (RR 1.38, 95% CI: 1.16-1.65, p0.001), case-control (OR 1.68, 95% CI: 1.16-2.42, p= 0.006) and descriptive-analytical (OR 1.31, 95% CI: 1.07-1.59, p= 0.008).

Conclusion: The readmission rate of stroke due to infection is high and this factor can be controlled to a large extent. Maybe improving the quality of nursing care and strengthening the patient follow-up system, will help to reduce these infections. More studies are needed in this field.

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Women Experiences on Nosocomial Infections after Pelvic Floor Surgery

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Keywords:
Women, Experience, Nosocomial infections, Pelvic floor

ABSTRACT

Introduction: Some women suffer from postoperative side effects after surgery to treat pelvic organ prolapse (POP). This meta-synthesis examines women's experiences of infection following pelvic floor surgery.

Materials and Methods: A systematic review was conducted on empirical qualitative studies of women who underwent pelvic organ surgery. The peer-reviewed published articles were comprehensively searched from multiple sources and data were drawn from 8 eligible articles and criticized applying ENTREQ tool to gain a holistic view of women's lived experiences.

Results: Four main themes emerged from this meta-synthesis, including: 1) "Physical discomfort": most participants experienced symptoms such as pain, discomfort during injury, and recurrent urinary tract infections (UTIs) that interfered with daily activities and Welfare. 2) "Psychological distress": participants have experienced feelings of stress, anxiety, and frustration associated with ongoing effects and felt being helplessness and inadequate psychological support during recovery. 3) "Social distancing": they cannot do their usual tasks well and are ashamed to explain their discomfort to others, which makes them feel lonely and affects their relationships. 4) "Un-pleasant interaction with provider": participants were dissatisfied with the care they received after surgery. They believe that they should not receive the necessary attention and need more support and care from health service providers.

Conclusion: The findings of the study show the need for better quality care and empathic technology. This meta-synthesis will help women's voices to be heard and their concerns taken into account and help health care providers plan cares to improve post-surgical care.

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Wound Bed Preparation: Biofilm Management and Wound Debridement

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ARTICLEINFO

Orals

Keywords:
Biofilm, Chronic wounds, Debridement, Wound healing, Extracellular polymeric substance, Autolytic debridement

ABSTRACT

Introduction: Biofilm is a structured community of bacterial cells encased in a self-produced extracellular polymeric matrix (EPS) that adheres to a living or inert surface. Biofilm formation is a significant concern in chronic wound infections, as it acts as a barrier to wound healing. This study aims to introduce the formation and removal of biofilm from wound beds and explore various effective debridement methods for biofilm elimination.

Materials and Methods: This narrative review synthesizes recent articles focused on biofilm formation and debridement techniques for biofilm removal in chronic wounds.

Results: Biofilm formation occurs in several stages: 1-Reversible Attachment (Bacteria initially attach to the wound bed surface within minutes, with a reversible connection). 2- Irreversible Attachment (Bacteria form a stable bond and initiate microcolony formation within 2 to 4 hours). 3-Maturation I (The development of a polysaccharide and protein matrix occurs over 6 to 12 hours). 4-Maturation II (Bacteria form a "mushroom" structure, increasing resistance to antibiotics and antiseptics). 5-Dispersion (The polysaccharide matrix breaks down, releasing bacteria into the environment, which can spread infection). Biofilm impedes wound healing by masking infection signs, serving as a nutrient source for bacteria, acting as a barrier to tissue regeneration, impairing wound contraction, and promoting the continuous production of inflammatory cytokines, leading to excessive matrix metalloproteases (MMP) production. Effective biofilm removal requires targeted debridement techniques, including: autolytic, enzymatic, mechanical (e.g., scrubbing, whirlpool, pulsed lavage, low-frequency ultrasound), instrumental (e.g., sharp, surgical, hydrosurgical), and biotherapy Debridement

Conclusion: Removing biofilm from wound beds is essential for improving chronic wound healing outcomes. A combination of debridement methods, tailored to the patient's condition, can effectively reduce biofilm presence and support wound healing processes.

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The Impact of Tour Introduction on Nursing Students &; Knowledge and Attitudes Regarding Patient Safety and Infection Control Standards

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ARTICLEINFO

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Keywords:
Knowledge, Nosocomial infection, Nursing student, Prevention

ABSTRACT

Introduction: Education is a complex and long-term process. The primary goal of nursing education is to train competent and efficient nursing staff that possesses the necessary knowledge, skills, and attitudes to maintain and improve people's health in clinical settings. Studies have shown that employees have not received enough training to perform activities and make decisions in managerial conditions. Lack of knowledge and preparation has been identified as the main factor creating emotional pressures during the implementation of activities and decisions. Simulated training and exposure to a clinical environment have been found to improve management attitude and performance. All of the mentioned scenarios are only possible if the nursing management internship student can apply the key skills of infection control and patient safety management in the internship environment to the main goals of health treatment services in clinical settings. These goals include providing the desired nursing care to bring patients to the highest level. However, nursing students often struggle with communicating theoretical topics and applying management skills in running departments and providing clinical care. Patient safety and Nosocomial infection is a major cause of mortality and morbidity in hospitalized patient. Component of healthcare quality is defined as the avoidance of causing harm to patients in providing healthcare services.
Materials and Methods: In 2023, a cross-sectional study was carried out on 78 nursing students in state hospitals of ALBORZ. The data was collected through the completion of the Patient Safety Culture Scale and Checklist, designed by the researcher, along with a personal information form. The checklist used in the study involved a 30-item Likert scale to be filled out by both the supervisor and the student. The final score was calculated as the sum of the points.
Results: The study found that 65% of the students were male, and 89% of them were satisfied with the tour introduction. Additionally, 15% of the students demonstrated positive attitudes and knowledge regarding patient safety and infection control guidelines.
Conclusion: The mean score for the knowledge and practice of nursing students was 8.61±2.03 and 5.00±2.43, respectively, on a scale of 0-10, which was significantly higher than the scores for.