

## Incidence of Diarrhea in Hospitalized Patients with Standard Enteral Formula

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ARTICLE INFO	ABSTRACT
<p><b>Article type:</b> Original Article</p> <hr/> <p><b>Article history:</b> Received: 7-July-2014 Accepted: 28-Aug-2014</p> <hr/> <p><b>Keywords:</b> Diarrhea Enteral nutrition Formula</p>	<p><b>Introduction:</b> Malnutrition is common in intensive care unit, occurring in (30% to 50%) of hospitalized patients. To prevent malnutrition, nutritionists recommend industrial formula for patients who cannot eat but with functional gastrointestinal track, But due to verbal nurse`s reports standard enteral formula is inducing diarrhea. In this study our purpose is to evaluate the incidence of diarrhea in hospitalized patients with standard Enteral Nutrition (EN) formula intake.</p> <p><b>Materials and Methods:</b> 13 patients participated in our study. We used Milatech brand as enteral formula. Formula administration was depended 200 or 250 cc every two or three hours a day in dependent to patients needs and tolerance. Gastro Intestinal (GI) complications were recorded by nursing staff in patients medical records. Complication frequencies were considered during three days for each person.</p> <p><b>Results:</b> No patients have diarrhea, only residue was seen in four patients.</p> <p><b>Conclusion:</b> Evaluation of patients receiving Milatech standard formula showed that diarrhea wasn`t seen in hospitalized patients. Diarrhea was reported by the nurses may refer to other diarrhea genic causes including of long length of stay, entral duration or medical side effects or infections.</p>

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### Introduction

Enteral Nutrition (EN) is used for patient who is unable to obtain their nutritional requirement orally.

Malnutrition is common in intensive care unit, occurring in (30% to 50%) of hospitalized patients (1).

In a multi centric study on incidence of nutritional support complications, incidence of diarrhea was (8.3%) (2). The consequences of diarrhea have been well established and include electrolyte imbalance, dehydration, bacterial translocation, peri anal wound contamination and sleep deprivation. Diarrhea varies widely between (2.3 and 68%). This wide variation in incidence is due, in part, to the lack of a universal definition of diarrhea and other factors that influence stool output such as mal absorption, infection, bacterial contamination of feeding, medical diagnosis, medication therapy, or formula-related causes (3). Due to the important consequence of diarrhea and it`s prevalence, studies were done to find the effect of different formula on diarrhea. Peake studied the complications of a concentrated enteral nutrition solution. Usage of this formula did not alter rate of

diarrhea (4). In other study incidence of diarrhea with high protein formula was (9.09%) (5). Nutritionists recommend industrial standard formula for patients who cannot eat but with functional Gastro Intestinal (GI) track to prevent malnutrition. But due to verbal nurse`s reports standard enteral formula is inducing Diarrhea. In this study our purpose is to evaluate the incidence of diarrhea in hospitalized patients with standard EN formula intake.

### Materials and Methods

#### Patient

13 patients hospitalized in Ghaem Hospital, in Mashhad, Iran in springer in 1393 were participated in our study. Patients received industrial formula for three days. Our inclusion criteria were receiving standard formula at least for three days, patients with 18 years of old or more. Our exclusion criteria was addiction, receiving standard EN formula less than three days, patients less than 18 years old, usage of laxative drugs and diarrhea or constipation before study.

**Data collection**

Clinical and demographic data were collected. GI complications including of diarrhea (more than three bowel movements daily), constipation (fewer than three defecations per week), vomiting (the forceful expulsion of gastric contents), distension and residue (increase in gastric lavage was defined as an aspiration volume >50% of gavage volume at 30 minute after gavage) were recorded by nursing staff in patient medical records. Definition of complications are reviewed with nurses before study. For each patient, data were collected during the first three days of EN.

**Formula composition**

Formula administration was 200 or 250 cc every two or three hours a day in dependent to patient needs and tolerance. Brand of enteral formula used in this study was Milatech and we used Milatech standard formula.

This formula is including maltodextrin, soy protein, milk protein, MCT oil, fish oil and canola oil. Energy content of formula is 1kcal/1cc.

**Results**

In this study we had eight males' patients from all 15 patients. Median age of patients in this study was 44 years old. Median time of Long of Stay (LOS) and duration of EN were 19 and 16 days respectively (Table1).

**Table1: Characteristics of patients receiving enteral nutrition (EN)**

Variable	All(n=13)	
Male	8	
Female	5	
Non intensive care unit	3	
Intensive care unit	10	
Length of stay	<19	5
	>19	8
Duration of EN	<16	5
	>16	8

\*Median (interquartile range)

Frequency of gastrointestinal complications is showed in table 2.

**Table2: Frequency of GI Complication among standard formula enterally fed patients**

GI complication	All(n=13)
Distension	0
Diarrhea	0
Vomiting	0
Residue	4
Constipation	0

**Discussion**

Diarrhea is frequently reported in the hospitals. In our study we have no report of diarrhea and this report is different from results from other studies.

Little is known about diarrhea incidence and the role

of the different risk factors alone or in combination.

Most previous studies on EN associated diarrhea have concentrated on the risk of infectious diarrhea due enteral feeding equipment, formula sterility and side effect of medications, fiber content of the formula (6-7). Also diarrhea may be related to low serum albumin level (8). Promotion of guidelines for enteral tube feeding may result in decreasing of contamination and therefore incidence of diarrhea. Lack of a universal definition of diarrhea was one of reasons for this wide variation in incidence of diarrhea in different studies (3). Garey reported incidence of diarrhea (12.4%) at a university hospital and showed that Patients with diarrhea were more likely to experience a longer hospitalization (6). Agudelo showed that complications of highest incidence were the high gastric residue and diarrhea for EN. In our study complication of highest incidence was gastric residue and wasn't reported diarrhea (2). Long length of stay more than 21 days and receiving EN more than 11days have more association with diarrhea (7). Providing enteral nutrition to the hospitalized elderly during the summer months is associated with a higher risk of diarrhea (9).

Formula composition is also important in GI complications such as diarrhea. A meta-analysis of 51 studies showed that fiber riched enteral formula was associated with decreased diarrhea in non-ICU patients (10). Barret showed Fermentable Oligosaccharides, Disaccharides, Mono saccharides and Polyols (FODMAPs)—a group of short-chain carbohydrates - are poorly absorbed and can lead to bowel distension, blotting abdominal discomfort and alter gut motility which promotes diarrhea (11). Halmos showed that formula comprising the lowest FODMAPs reduced diarrhea (12).

Maltodextrein that is used in our formula is polysaccharide with high absorption and very low ferment ability and our formula doesn't contain fiber.

Critically ill patients typically receive ~60% of estimated calorie requirements (5). In this study we provided appropriate energy requirement for patients due to good tolerance and lack of complication that lead to prevention of malnutrition in hospitalized patients.

**Conclusion**

In conclusion, evaluation of patients receiving Milatech standard formula showed that diarrhea wasn't seen in hospitalized patients. Diarrhea was reported by the nurses may refer to other diarrhea genic causes including long length of stay, enteral duration or side effect of medications or infections. However we suggest that this study is committed with more patients and more duration of formula intake.

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