

Effect of Urticaria Spray on the Pain Severity in Chronic Low Back Pain Patients Referring to an Orthopedic Clinic

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ARTICLE INFO	ABSTRACT
<p>Article type: Original Article</p>	<p>Introduction: Regarding the serious effect of chronic back pain on the quality of life of people, the patients seek treatments to relieve back pain. This study aimed to investigate the anti-inflammatory properties of the nettle plant (<i>Urtica dioica</i>) as a spray in reducing the pain severity of the low back.</p> <p>Materials and Methods: This controlled clinical trial included 40 patients with chronic back pain who were referred to an Orthopedic Clinic affiliated with Shahid Beheshti Hospital, Sabzevar, Iran. The patients were selected using a convenient sampling method, and they were then divided randomly into group A (receiving routine medical care) and group B (receiving urticaria spray and routine medical care). The pain severity was measured using the visual analog scale (VAS) after an intervention. The data were analyzed in SPSS software.</p> <p>Results: Both groups obtained similar VAS scores before the study (P=0.15). The results of VAS scores showed a significant decrease in the mean pain severity after intervention in both groups (P=0.01). However, both groups were similar regarding the reduction level in VAS scores (P=0.06). Furthermore, multiple linear regression analysis determined that urticaria spray could decrease pain severity up to 79%, on average.</p> <p>Conclusion: The results revealed that the addition of urticaria spray to the routine treatment care had no effects on reducing chronic low back pain.</p>
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Introduction

Chronic low back pain has a serious effect on the life quality of people. Accordingly, people with this condition cannot continue to live without worries, discomfort, and impairment in their lives (1). More than 60-90% of the total population suffer from low back pain at least once in their life, which is called chronic back pain if it lasts more than 12 weeks (2,3). The incidence rate of chronic low back pain was estimated at 36.8% in Iran, which is 17.8% and 34% in males and females, respectively (4). Patients might use harmful methods, such as medicines and narcotic analgesics, to reduce their chronic back pain.

According to a previous study, many patients with chronic low back pain have job incompatibility, behavior disorders, dependence on medications, and uncertain relationships (5). The consumption of non-steroidal anti-inflammatory drugs (NSAIDs) is the first treatment to reduce low back pain. These medications have gastrointestinal side effects, including nausea, diarrhea, peptic ulcer, and even gastrointestinal bleeding (6,7). Medicinal plants have long been one of the most important human tools for the treatment of diseases (8), and the application of medicinal plants has a long history in India, Iran, Egypt, China, East Asian countries, and Mesopotamia (8). Therefore, researchers introduce the use of complementary medicine and herbal medicine as a low-cost treatment, and the general population has considered the application of medicinal plants (10). Urticaria species (*Urtica dioica*), often called nettles, was introduced in ancient Iranian medicine as one of the medicinal plants due to its anti-inflammatory and analgesic properties. This medicinal plant has been recently used in the treatment of many infectious diseases, such as prostatitis, urinary tract infections, liver toxicity, and arthritis symptoms (9,10). Urticaria extract could reduce the pain and inflammation by inhibiting the release of cytokines and inflammatory mediators, such as Vaso Inhibitory Peptide and Tumor N Factor (TNF) (11,12).

The nettle contains various substances, including Caffeic acid, Polysaccharides,

Lectins, Agglutin, Scopolatin, Serotonin, as well as Vitamins B, C, and K. According to several studies, the anti-inflammatory effects of the nettle have been proven by the presence of substances, such as malic acid, phenolic acids, and flavonoids, which interfere with the inflammatory products of the immune cells (13).

A previously conducted study utilized the nettle extract successfully along with fresh nettle leaves prepared as a cream to treat osteoarthritis pain (14). This controlled clinical trial aimed to investigate the effect of urticaria spray on the reduction of chronic low back pain symptoms.

Materials and Methods

This randomized clinical trial was performed on chronic low back pain patients who were referred to a clinic affiliated with Shahid Beheshti Hospital, Sabzevar, Iran. The study protocol was approved by the local Ethics Committee of Sabzevar University of Medical Sciences, Sabzevar, Iran (IR.MEDSAB.REC.1396.76 code) and registered in the Iranian Registry of Clinical Trials (IRCT. 20171217037930N1). The inclusion criteria were: 1) chronic low back pain, 2) age range from 40 to 80 years, 3) complete awareness, 4) ability to use urticaria sprays, and 5) complains of back pain during last three months. On the other hand, the patients with a history of drug use and trauma, physiotherapy treatments, utilization of hot water bags, allergy to urticaria spray, surgical indications, pregnancy or lactation, and those with complications on the back that prevented the use of nettle spray were excluded from the study. Specialist physicians made the diagnosis of chronic low back pain. It should be mentioned that a consent form was obtained from all participants, and they were allowed to leave the research procedure at any time without interfering with their normal treatment process.

Sample size

Visual analog scale (VAS) was considered a benchmark to measure the low back pain on the last report for the treatment of patients (15). Considering a 1.54 standard deviation of pain, the effect size was calculated at 1.29. Consequently, considering 75% cure ratio,

90% study power, and a 5% two-sided type I error, 15 cases were assigned into any groups of A and group B. Moreover, concerning 15% sample attrition, the participants elevated to 20 cases in each group, and the total number of the patients

was estimated at 50 cases. However, 10 subjects left the research procedure due to not satisfying the inclusion criteria and unwillingness to participate in the study (Figure 1). Finally, 40 patients with chronic low back pain were entered into the study.

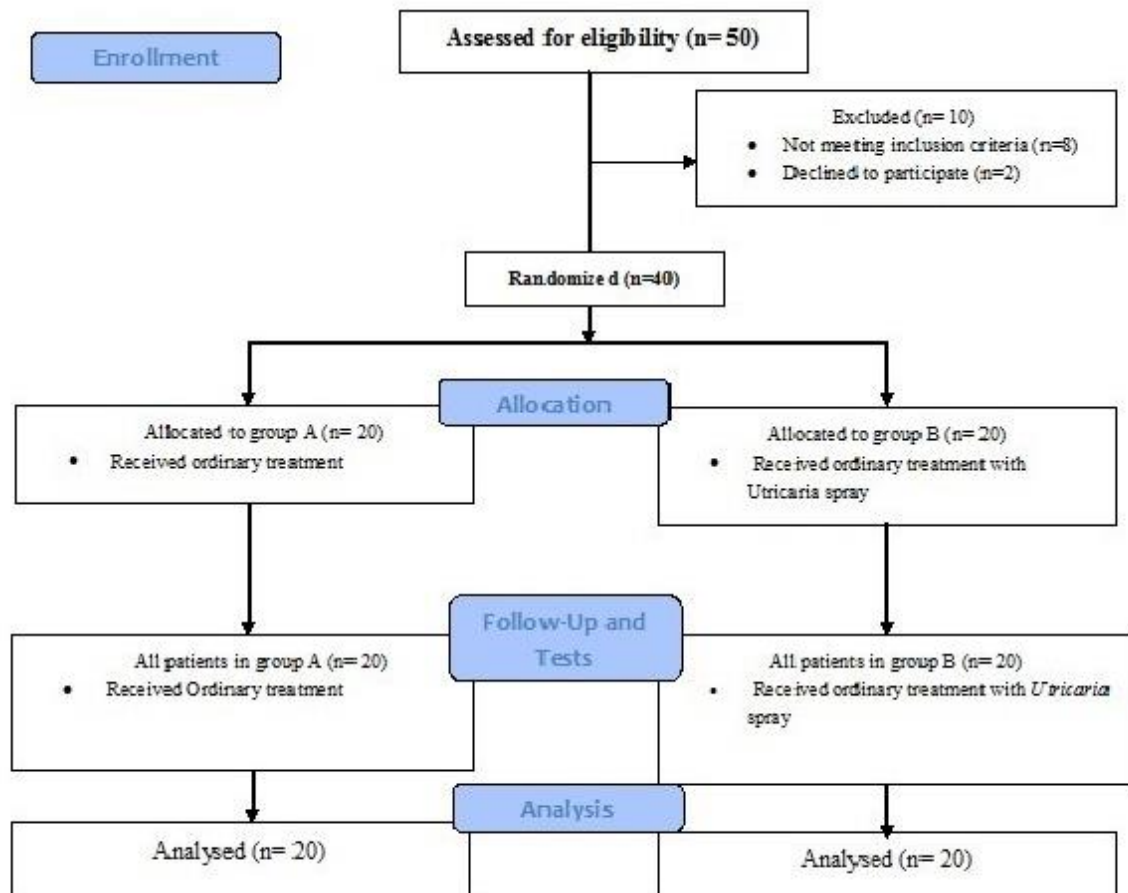


Fig 1: Flow chart diagram of patients

Study protocol

The demographic characteristics of the patients covered such information as gender, age, occupation, and consumption of medications. Following that, the patients were divided randomly into two groups according to the day they were referred to our clinic. Group A (control group) was attributed to the patients who were referred on Sundays, Tuesdays, and Thursdays, and group B (intervention group) was attributed to those who were referred on Saturdays, Mondays, and Wednesdays. Both groups were under routine treatments and received celecoxib tablets daily. Moreover, group B received celecoxib plus urticaria spray locally

(two puffs twice daily for two weeks). The VAS is a uni-dimensional tool that has been widely used to measure the pain severity in adult populations (16). This continuous scale consists of a parallel line, typically 10 centimeters (100 mm) in length, fixed by two verbal descriptors (17, 18). The VAS was used before the study protocol and after two weeks of intervention in this study.

Statistical analysis

The collected data were analyzed in SPSS software (version 20) through the chi-square test to evaluate the differences between qualitative and descriptive variables. Furthermore, the qualitative variables were presented as frequency and

percentage. Moreover, a paired t-test was utilized to signify the differences of VAS scores between data obtained before and after the trial. An independent sample t-test was also employed to evaluate the differences in the two groups regarding VAS scores. A p-value less than 0.05 was considered statistically significant.

Results

Participant's information

Table 1 presents the demographic characteristics of the studied population. Totally, 40 patients were enrolled in this study, and the majority of the participants

were female (n=35). Moreover, the mean age of the patients was 56.8 ± 10.43 years (agerange: 40-80 years). There was no significant difference between the two groups in terms of age. In addition, no significant difference was observed between group A and B regarding qualitative variables, including gender, age, and occupation ($P > 0.05$). Furthermore, regarding the consumed medications, celecoxib was found to be the most common medicine used by the patients. It is worth mentioning that the two studied groups were similar in terms of the consumed medicines to reduce the low back pain ($P > 0.05$, Table 1).

Table 1: Demographic characteristics of the studied population

Variables	Group A (%)	Group B (%)	P-value
<i>Gender</i>			
Male	2 (10)	3 (15)	0.85
Female	18 (90)	17 (85)	
<i>Age Category (year)</i>			
40->=50	7 (35)	7 (35)	1
50->=60	6 (30)	6 (30)	
60->	7 (35)	7 (35)	
<i>Occupation</i>			
Housemaid	10 (50)	14 (70)	0.73
Employee	3 (15)	2 (10)	
Unemployed	1 (5)	1 (5)	
Worker	6 (30)	3 (15)	
<i>Consumed medicines</i>			
Celecoxib	11 (59.9)	9 (40.91)	0.31
Gabapentin	4 (57.4)	3 (42.86)	
Naproxen	3 (60)	2 (40)	
Diclofenac	0	4 (100)	
Celecoxib and Gabapentin	2 (50)	2 (50)	

Numbers in the parenthesis showing the percentage of related frequency. P-value was calculated by the chi-square test.

Variations in the visual analog scale scores during the study:

Table 2 tabulates the variations observed in the VAS scores during the study. According to Table 2, the two groups had similar VAS

scores before the study ($P > 0.05$, Table2). However, the VAS scores were significantly decreased after treatment in both groups, compared to the scores before the study ($P = 0.01$).

Table 2: Variations in the visual analog scale scores during the study

Variable	Before	After	*P-value
Group A	7.9 ± 1.71	4.47 ± 2.09	0.01
Group B	8.55 ± 1.14	5.7 ± 1.83	0.01
§P-value	0.15	0.06	

P-value was calculated by the independent sample t-test and *paired t-test. A p-value less than 0.05 was considered statistically significant.

The regression analysis was performed to investigate the effect of confounding factors on VAS scores among the studied participants (Table 3). Furthermore, the analysis showed no significant statistical effect of demographic characteristics on VAS

scores ($P>0.05$). Additionally, the effect of urticaria spray on VAS scores was not significant among the studied participants ($P=0.07$). However, urticaria spray could decrease VAS scores to 79% (Table 3).

Table 3: Regression analysis of the studied variables on the visual analog scale

Variable	P-value	Confidence Interval	Standard Error	B Factor
Urticaria	0.07	-1.67-0.08	0.43	-0.79
Gender	0.17	-0.49-2.57	0.75	1.04
Age	0.72	0.62-0.43	0.26	0.09
Occupation	0.10	0.17-1.53	0.33	0.85

P-value was calculated by the independent sample t-test and *paired t-test. A p-value less than 0.05 was considered statistically significant.

Discussion

Investigation of anti-inflammatory properties of the urticaria showed that nettle extract induced severe and dose-dependent inhibition of $TNF\alpha$ and IL-6 secretion (19). Malic acid as a major phenolic component of the nettle plants prevents cyclooxygenases synthesis in a dose-dependent manner, and therefore, inhibits cytokines (20). Furthermore, this occurs before the nettle with anti-inflammatory effect could inhibit production prostaglandins and prevent the formation of cyclooxygenase 1 and 2 in the pro-inflammation pathway (13).

Most people accept the use of medicinal herbs due to conventional beliefs in the effectiveness of natural substances in related treatments. In this study, both groups experienced a decrease in the pain intensity due to simultaneous consumption of pain sedation medical treatments with nettle spray; however, there was no statistically significant difference between the groups regarding the reduction in the pain severity based on VAS scores. According to the results of a previously conducted study on the anti-inflammatory effect of urticaria cream on knee pain, the nettle extract reduced pain and inflammation caused by osteoarthritis significantly (14). Although the findings of this study are consistent with the results of the aforementioned studies, the

discrepancies between the studied groups might be due to the use of nettle spray to decrease chronic low back pain, compared to the utilization of the fresh nettle leave cream in decreasing the minor pain in a study by Rayburn et al. (14).

Genc et al. (21) also concluded that nettle seed oil reduced lactate dehydrogenase, triglycerides, inflammatory cytokines, and cholesterol. Therefore, the nettle extract has inserted its modulating effects on colon inflammation due to its anti-inflammatory effect and antioxidant function (21). On the other hand, the results of the effect of oral administration of the nettle extract on the experimental colitis in rats were not consistent with the findings of the present study. Furthermore, it might be probable that concomitant use of oral medicines with nettle components certainly could not determine the effect of using nettle spray alone on pain reduction. Accordingly, it is preferred to use nettle extract alone to treat pain.

Conclusion

The results of the present study revealed that the simultaneous administration of celecoxib and nettle spray, compared to celecoxib alone, had similar results on pain decrement related to chronic low back pain. This result might be attributed to the low number of the studied participants and use of celecoxib at the same time with urticaria spray. Further studies are recommended to investigate the therapeutic effects of nettle

extract on chronic low back pain in a larger statistical community and consider a separate treatment group with nettle spray for certainty.

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References

1. Tantawy SA, Kamel DM, Abdelbasset WK, Nambi G. A randomized controlled trial investigating the impact of interferential therapy on pain, range of motion and quality of life in patients with chronic non-specific low back pain. *Archives of the Balkan Medical Union*. 2020;55(1):47-54.
2. Balagué F, Mannion AF, Pellisé F, Cedraschi C. Non-specific low back pain. *The lancet*. 2012;379(9814):482-491.
3. Heidari RS, Sahebozamani M, Karimi Afshar F. Comparison of the effects of 8 weeks of core stability exercise on ball and sling exercise on the quality of life and pain in the female with non-specific chronic low back pain (nslbp). *Journal of Advances in Medical and Biomedical Research*. 2018;26(117):44-56.
4. Ghiasi F, Sangtarash F. The effect of stabilization method and Williams exercise on improvement of functions in patients with mechanical chronic low back pain. *Journal of Shahrekord University of Medical Sciences*. 2007;8(4):21-28.
5. Daniel MS, Long C, Hutcherson W, Hunter S. Psychological factors and outcome of electrode implantation for chronic pain. *Neurosurgery*. 1985;17(5):773-777.
6. Essex M, Bhadra P, Sands G. Efficacy and tolerability of celecoxib versus naproxen in patients with osteoarthritis of the knee: a randomized, double-blind, double-dummy trial. *Journal of International Medical Research*. 2012;40(4):1357-1370.
7. Ramachandran P, Onukogu I, Ghanta S, Gajendran M, Perisetti A, Goyal H, et al. Gastrointestinal Symptoms and outcomes in hospitalized COVID-19 patients. *Digestive Diseases*. 2020;38(5):373-379.
8. Sen S, Chakraborty R, De B, Ganesh T, Raghavendra H, Debnath S. Analgesic and anti-inflammatory herbs: a potential source of modern medicine. *International Journal of Pharmaceutical Sciences and Research*. 2010;1(11):32-44.
9. Khalili M, Sahraee H, Hassanpour Ezati M. Anti-inflammatory effect of alcoholic stinging nettle extract in male nmri rats. *Journal of Medicinal Plants*. 2007;2(22):46-53.
10. Namazi N, Esfanjani AT, Asghari M, Bahrami A. Effect of Hydroalcoholic Nettle (*Urtica dioica*) Extract on. *J Med Sci*. 2011;11(3):138-144.
11. Rathee P, Chaudhary H, Rathee S, Rathee D, Kumar V, Kohli K. Mechanism of action of flavonoids as anti-inflammatory agents: a review. *Inflammation & Allergy-Drug Targets (Formerly Current Drug Targets-Inflammation & Allergy)*. 2009;8(3):229-235.
12. De P, Baltas M, Bedos-Belval F. Cinnamic acid derivatives as anticancer agents-a review. *Current medicinal chemistry*. 2011;18(11):1672-703.
13. Namazi N, Tarighat A, Bahrami A. The effect of hydro alcoholic nettle (*Urtica dioica*) extract on oxidative stress in patients with type 2 diabetes: a randomized double-blind clinical trial. *Pakistan Journal of Biological Sciences*. 2012;15(2):98-102.
14. Rayburn K, Fleischbein E, Song J, Allen B, Kundert M, Leiter C, et al. Stinging nettle cream for osteoarthritis. *Alternative Therapies in Health & Medicine*. 2009;15(4):60-61.
15. Norouzi K. The Effect of Six Weeks Supine Movement in Water on the Pain and Disability in Men with Chronic Low Back Pain Due to Lumbar Disc Herniation. *Journal of Paramedical Sciences & Rehabilitation*. 2016;5(1):14-19.
16. McCormack HM, David JdL, Sheather S. Clinical applications of visual analogue scales: a critical review. *Psychological medicine*. 1988;18(4):1007-1019.
17. Downie W, Leatham P, Rhind V, Wright V, Branco J, Anderson J. Studies with pain rating scales. *Annals of the rheumatic diseases*. 1978;37(4):378-381.
18. Huskisson EC. Measurement of pain. *The lancet*. 1974;304(7889):1127-3111.
19. Teucher T, Obertreis B, Rutkowski T, Schmitz H. Cytokine secretion in whole blood of healthy subjects following oral administration of *Urtica dioica* L. plant extract. *Arzneimittel-Forschung*. 1996;46(9):906-910.
20. Obertreis B, Giller K, Teucher T, Behnke B, Schmitz H. Anti-inflammatory effect of *Urtica dioica* folia extract in comparison to caffeic malic acid. *Arzneimittel-Forschung*. 1996;46(1):52-56.
21. Genc Z, Yarat A, Tunali-Akbay T, Sener G, Cetinel S, Pisiriciler R, et al. The effect of stinging nettle (*Urtica dioica*) seed oil on experimental colitis in rats. *Journal of medicinal food*. 2011;14(12):1554-1561.