



# The Effect of Complementary Medicine-Based Intervention on Burning Patients' Pruritus

Neda Fayazi<sup>1</sup>, Kobra Rahzani<sup>2\*</sup>, Koorosh Rezaei<sup>3</sup>, Shaban Ali Alizadeh<sup>4</sup>

<sup>1</sup>MSC Critical care nursing, Arak University of Medical Sciences, Arak, Iran.

<sup>2</sup>Ph. D of nursing, Faculty of Nursing and Midwifery, Arak University of Medical Sciences, Arak, Iran.

<sup>3</sup>MSC Medical Surgical Nursing, Faculty of Nursing and Midwifery, Arak University of Medical Sciences, Arak, Iran.

<sup>4</sup>Specialist in General Surgery, Faculty of Nursing and Midwifery, Arak University of Medical Sciences, Arak, Iran.

## ABSTRACT

*Introduction: Post-burn itching is a common complication among those who suffer burn injury. This can interrupt daily life activities and damage the individuals' mental health. Because no acceptable research has been done to cure this condition, this research has been conducted to study the effects of lemon balm tea on itching. Method: This is a clinical trial in which ninety people who suffered itching were randomly selected and were divided in two groups of control and experimental. The pruritus rate was measured each day for three weeks with a visual analogue scale. To analyze the cells in inflammatory response, the blood cells were counted twice a week during the study. The intervention group received lemon balm tea twice a day for two weeks in addition to the common itching treatments. The control group received only the common treatments. Finally, the data was analyzed using descriptive and inferential statistics. Results: At the beginning of the study, the average severity of itching rate was 1/4 in intervention group and 2/7 in control group which was not statistically significant. In the first, second and third weeks in the control group, it was 5.29, 5.54, and 6.56; respectively, and in the intervention group, it was 3.21, 3.3 and 2.47. The range of eosinophils in the control group was 5.84, 7.84, and 8.48, and in the intervention group, it was 5.55, 5.17 and 5.11; respectively. Also, the range of neutrophils in the control group was 84.91, 130.02 and 119.57, and it was 119.97, 120, 82 and 93, 94 in the intervention group. There was a remarkable difference between the average severity of itching, eosinophils and neutrophils in the intervention and control group during the three weeks. Conclusion: According to the results, lemon balm tea decreased the itching severity and the number of inflamed cells, and was effective in reducing post-burn itching in the intervention group.*

**Key Words:** Lemon Balm Tea, Burn, Blood Cells Counting.

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## INTRODUCTION

Burn is a type of skin injury caused by energy transfer from the heat source to the body [1, 2]. According to Rendon et al., (2013), nearly one million burn injuries occur in the United States yearly [3]. In Iran, about 100,000 people die because of the complications of burn [4]. The clinical experiences of survivors of burns indicated that this disaster is accompanied by devastating tension and can lead to permanent Spiritual, psychological and physical changes in individuals, and can affect all aspects of quality of life [5]. The frequency of severe burns and the

complications of this injury in terms of mortality, illness and social and economic costs on society has been a good reason to pay special attention to burn victims by health experts, especially nurses, whose role in caring patients and improving their health has been well defined [6, 7].

Itching, as one of the post-burn physical problems, is one of the most common and destructive complaints that occurs in 93% of patients at the time of discharge [8-10]. Persistent itching causes symptoms such as sleep disorder, impaired daily activities, and neuro degenerative disorders [11, 12]. Also, through sleep disturbance, attention and concentration can affect the quality of life [13]. Itching

**Corresponding author:** Kobra Rahzani

**Address:** Ph.D of Nursing, Faculty of Nursing and Midwifery, Arak University of Medical Sciences, Arak, Iran .

**E-mail:** ✉ Rahzani.K@gmail.com

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burns up years after burning and causes patients' discomfort and major problems in the process of treating burns [3, 14]. Many texts related itching to the release of histamine, followed by inflammatory reactions. In general, there has been no theoretical agreement regarding itching [15, 16]. To minimize itching, various pharmaceutical and non-pharmaceutical strategies have been used [12]. Today's standard treatment uses antihistamines, which is effective only in 20% [17].

Considering many complications of chemical drugs used for the treatment of diseases, and increased tendency to use complementary medicine and alternative medicine in the care and treatment of diseases around the world, the use of herbal products has been increasing [18-27]. The history of the use of plants for therapeutic and medical purposes dates back to 3000 BC. Lemon balm tea is one of the medicinal herbs that has been shown to be sedative, antibacterial and antiviral, anti-spasmodic, anti-inflammatory. It also has anti-oxidant and anti-inflammatory properties and anti-hormonal, anti-carcinogenic and analgesic effects [11, 28 - 32].

Following a burn, the production of free oxygen radicals has been known to be a factor in inflammation [33]. In a study by Abbasdust Arbastan et al. (2014), it was found that lemon balm can heal burn wound quickly, which seemed to be due to its anti-inflammatory effects [34]. In addition, it has been shown in studies that the herb has been effective in reducing itching caused by Herpes [35]. Regarding the high incidence of burns, especially in Iran, and due to the prevalence of itching, that can disrupt the life of individuals, and the destructive effects of free radicals and oxidative stress, and due to the effects of some inflammatory reactions in itching, it is possible to use compounds such as lemon balm, which has anti-inflammatory and anti-oxidant properties, to reduce the itching of these patients. Therefore, in this study, it was decided to investigate the effects of lemon balm on post-burn itching, so that if it is found to be effective, it can be used as a supplemental itch treatment reducing the complications of itching and related treatments.

## MATERIALS AND METHODS:

The present study was a clinical trial that after receiving the Code clinical trial:IRCT2014091519178N1 and Code of ethics 93-165-12 in 90 patients suffering from burn hospitalized in the burn section of Valiasr Hospital in Arak were randomly divided into control and intervention groups. After considering the criteria of entry, they signed an informed consent and filled out a questionnaire (to evaluate the level of itching, burn and Demographic characteristics). At the beginning of the study, the itching rate was recorded as basic information in special forms, then the intervention group, in addition to the standard

treatment received in the burns, received 100 ml of lemon balm tea as an oral treatment, for two weeks, twice a day (morning and evening, when taking snacks) [34].

For daily preparation of this solution, 3g of dried leaves were poured into 200 ml of boiling water, and were indirectly heated for 10 minutes, then 100 ml was used in the morning meal, and the fresh solution was prepared following the above mentioned receipt served for the evening meal. Patients in the control group received only standard treatment. The severity of itching was measured based on the visual analog scale (0 to 10). Then, the patients were asked to determine the severity of their previous itching (in the case of night itching) on the checklist given to them. The severity of itching was reported on a daily basis from the beginning of the study until the end of the third week, but the average severity of itching was measured for each week (the first, second, and third week), (the average daily itching of one week was divided by seven). Thus, each person had three checklists for the first, second and third week of the study, recorded on each patient's daily checklist of itching. It should be noted that the treatment was carried out for two weeks, but the record of itching continued up to one week after the treatment in order to investigate the continuation of the intervention.

To determine the inflammatory markers, including neutrophils and blood eosinophils, a CBC (Complete Blood Count) was prepared as a baseline before the intervention, and then repeated for three weeks twice a week according to the routine portion, and eventually a weekly average of these white blood cells was given weekly for three weeks.

## FINDINGS:

According to Table 1, the two groups were similar in terms of demographic and pathological characteristics, and there was no difference between them (Table 1, Fig 1). According to Table 2, the results showed that the severity of itching in the intervention group was higher in the second week than in the first week, indicating a statistically significant difference ( $p = 0.03$ ), while it decreased from the second to the third week ( $p 0.001 =$ ) and first week to third ( $p = 0.005$ ). However, the average rate of itching in the control group gradually increased during the first week, the second to the third week, and from the first week to the third week, and its increase was statistically significant ( $p = 0.001$ )(Table 2).

## DISCUSSION & CONCLUSION

According to the results of the study in the intervention group, the level of itching, neutrophils and eosinophils of serum decreased significantly from week one to week three, which might be due to the effect of lemon balm tea in this group. Based on the literature review, there has been no study on the anti-pruritus effects of lemon balm in patients with burns. The only study that has been carried out on the effects of lemon balm in patients with burns available to researchers was the study by Abbasdust Arbastan et al., (2014) who investigated the recovery of burn wounds and oxidative stress. The results of this study showed that lemon balm have antioxidant properties, which leads to the improvement in burn wounds, and in other studies, the anti-inflammatory and antioxidant effects of the herb have been shown in lemon balm [34-37]. Studies have shown that after burning, the production of free oxygen radicals can cause inflammation. On the other hand, one of the causes of itching in burn patients is the excessive production of oxygen free radicals and inflammation from it [34]. This direct relationship between skin inflammation and itching has also been noted in Allahtavakoli et al. [38]. Therefore, due to the anti-inflammatory and antioxidant effects of this plant, the reduction in itching in the intervention group could be due to the use of lemon balm tea. In a study by Gorgi et al. on herpes simplex symptoms, it has been shown that the use of localized leishmaniasis can reduce the itching and other symptoms, and the duration between two herpes simplex attacks, the course of the disease, the prevention of the spread of infection and erythema. The anti-inflammatory effect of lemon balm has been attributed to the compounds such as Rosmarinic acid and Eugenol [28].

In another study, Barati (2008) assessed blood changes in Tehran's Burn Injuries Hospitals, the results showed that the amount of eosinophils was gradually increased one week after the burn. Although this study examined this amount on the first day of burn and the ahead study examined the rate on the first day of itching, both studies showed that the level of eosinophils after burn was gradually increased. In addition, the results of the Barati study showed that the neutrophils were gradually decreased one week after burn [39]. However, the findings of the current study represented that its rate will gradually increase one week after itching, it is possible that the cause of this contradiction can be justified by the different time of neutrophil examination in the two studies (in Barati's study, on the first day of burn, and in the current study, on the first day of itching).

The study of Nasrollahi (2001) also examined 60 anti-microbial activities in two groups of burn patients and healthy individuals by blood sampling. The results showed that the average neutrophils in the burn patients was higher than healthy subjects. According to the results of this study, burn injuries increased the amount of inflammatory cells,

including neutrophils, after injury, that the use of anti-inflammatory agents such as lemon balm tea has been effective in reducing neutrophil counts [40]. Considering that eosinophil is also an inflammatory cell of blood, this has been true for eosinophilia according to scientific literature [34]. Therefore, it can be said that the reduction of eosinophils and neutrophils in the intervention group might be due to the anti-inflammatory effects of lemon balm tea. Generally, according to the results of this study, the degree of itching in patients was reduced at the end of the study, and the levels of eosinophil and neutrophil haniz were decreased as inflammatory blood cells. Now, with the explanations mentioned above, it can be suggested that the use of herb is effective in reducing post-burn itching due to the anti-inflammatory compounds (rosemary and eugenol). Although the number of studies conducted in this area has been very limited, but according to the results of the present study, anti-inflammatory compounds of lemon balm tea appeared to be effective in reducing inflammatory cells in the blood.

Lloyd et al. (1977) investigated the rate of phagocyte function in 20 burn patients divided into three groups of mild, moderate and severe burns, for 8 weeks. Their results showed that during these 8 weeks, the phagocyte function was decreased to 30 percent of the base level. It should be noted that this study did not investigate the number of phagocytes in blood, and only in terms of performance, it was shown that their efficacy decreased by 30% compared to pre-burns [41].

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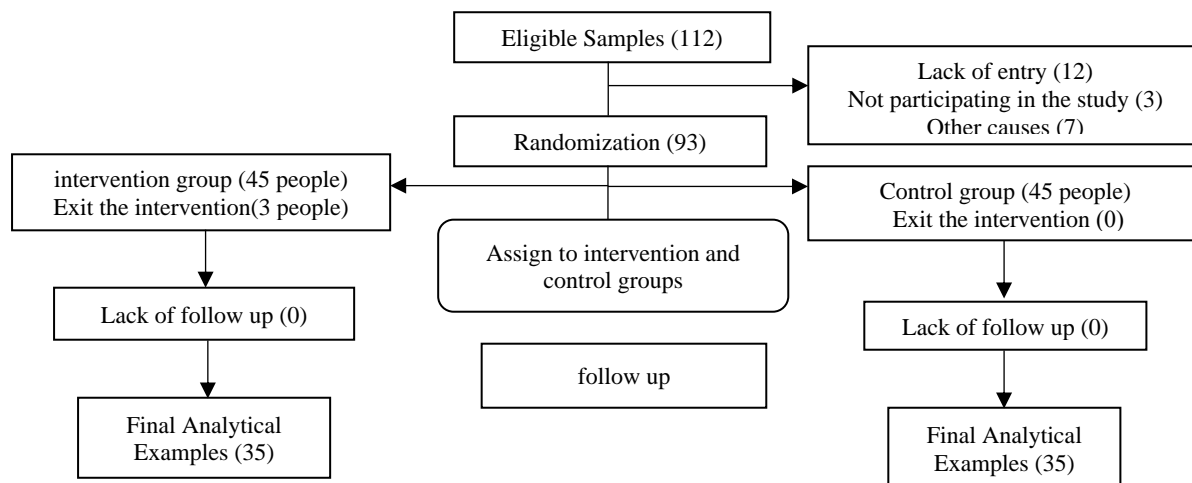
**Table 1: The frequency of burn injury patients according to the demographic characteristics in the intervention and control groups**

Index	Group	Index level	Frequency (individuals)	Frequency percent	P
Sex	Control	Male	38	84.4	0.53
		Female	7	15.6	
	intervention	Male	40	88.9	
		Female	5	11.1	
Education	Control	Illiterate	4	8.9	0.56
		cycle	22	48.9	
		Diploma	13	28.9	
	intervention	College education	6	13.3	
		Illiterate	6	13.3	
		cycle	19	42.2	
Occupation	Control	Diploma	20	44.4	0.12
		College education	0	0	
		Household	2	4.4	
		Business	26	57.8	
		Employee	9	20	
	intervention	Retiree	5	11.1	
		Student	2	4.4	
		Unemployed	1	2.2	
		Household	3	6.7	
		Business	32	71.1	
		Employee	6	13.3	
		Retiree	1	2.2	
		Student	2	4.4	
		Unemployed	1	2.2	

Weight	Control	standard deviation ± average	67.7±10.7	0.38
	Intervention	standard deviation +- average	66.6±10.0	
Age	Control	standard deviation +- average	43.7+-16.7	0.09
	Intervention	standard deviation +- average	40.2+-13.2	

**Table 2: The average itching rate, eosinophils and neutrophils in the first, second and the third weeks in the control and intervention group**

Variable	group	week 1	week 2	week 3	P
Itching	Intervention	3.21+- 1.52	3.3+-1.41	2.47+1.17	0.005
	Control	5.29+-2.75	5.54+-2.41	6.56+-2.25	0.001
neutrophils	Intervention	119.97+-30.3	120.82+-30.1	93.44+-35.1	0.004
	Control	84.91+-34.4	103.02+ 31.2	119.57+-2.8	0.001
Eosinophils	Intervention	5.55+-1.6	5.17+-2.7	5.11+-2.8	0.001
	Control	5.84+-3.2	7.84+-3.3	8.48+-3.2	0.001



**Fig. 1. Involvement Participants Schedule**