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Original Article

The effect of early change of skin graft dressing on pain and anxiety among burn patients: a two-group randomized controlled clinical trial

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Abstract: Burn is one of the injuries causing enormous pain among the patients, and the treatment procedure poses great anxiety. This study was designed to determine the effect of early change of skin graft on the pain and anxiety of the patients. Materials and methods: This clinical trial study was accomplished on 64 burn patients at Burn Center of Qazvin University of Medical Sciences in 2018. Convenience sampling was used to select the participants who were then randomly assigned into intervention and control groups. In the intervention group, the graft and donor site dressing was changed one day (early change) after the surgery, while it was done after three days for the control group, both in the same way. The researchers assessed the burn pain anxiety of the patients with BSPAS (Burn Specific Pain Anxiety Scale) and the pain intensity with VAS (Visual Analogue Scale). The data were fed into SPSS 21, and then Chi-square and independent t-test were calculated. Results: The average ages of the patients in the intervention and control groups were respectively 40.4±14.3 and 36.8±13.8. The percentage of burn was 12.1 in the intervention groups and 14.5 in the control group. Statistical analysis using Chi-Square revealed no significant differences between the two groups in the contextual variables (P>0.05). Pain intensity was 4±1.8 in the intervention group and it was 6±1.9 in the control group showing a moderate pain in the former group and severe pain in the control group (P<0.001). Furthermore, it was found that the anxiety level in the control group (46.8±11.2) was significantly greater than that of the intervention group (33.6±11.3) (P<0.001). Conclusion: Given that early change of skin graft and donor dressing has a positive effect on decreasing the amount of pain and anxiety, it is recommended to change the dressing in 24 hours after the surgery.

Keywords: Burn wound, pain anxiety, graft dressing, pain intensity, skin graft

Introduction

Burn is a kind of trauma which is very severe and leads to high mortality rate, heavy costs, hospital complications, and psychological problems [1]. Thermal damage results in the most harmful physical and psychological damage to the patient [2]. About 2 million people in the US annually burn, out of them half a million require outpatient medical treatment and the rest need hospitalization [3, 4]. One of the major issues burn patients encounter is suffering severe pain and high level of anxiety which bring about adverse effects, though nursing staff take no proper action to control it due to different reasons [5, 6]. The burn pain is analogized to hell pain because of its severity and intolerability [7, 8]. Due to skin damage, burn pain is felt throughout the treatment procedure containing washing, dressing, debridement, skin graft, and physiotherapy, although the main cause is the required daily care. Thus, decreasing the pain related to dressing change is one of the main ways to reduce the pain in such patients [9]. Not managing the pain in these patients will bring about various physiological, social, and psychological issues. If this acute and severe pain is not relieved, it will lead to a series of problems such as depression, discomfort, patient dissatisfaction, delay in wound healing, and prolonged hospitalization causing economic problems for the person and the society [10]. Pain is associated with hypermetabolism and since burn patients' nutrition needs increase, pain causes malnutrition in these patients, so pain management should be prioritized at all

stages of burn treatment [8]. Another problem, burn patients may encounter, is anxiety which both causes physical, mental and social low performance for the person and increases the pain [7]. These patients suffer great anxiety due to the pain intensity they put up with [11]. Anxiety is a state which affects one's emotions and causes him/her to feel that s/he is threatened by an outside situation which is out of his/her control [12]. A reciprocal relationship exists between pain and psychological problems such as anxiety and fear, that is, pain increases the anxiety and anxiety increases the pain. Anxiety not only increases pain, but postpones the wound healing by psychological and physiological problems [13, 14]. The most common cause of anxiety is the pain felt before, while, and after the dressing [13]. Anxiety prevention and treatment in burn patients is very important because if not treated, it leads to problems such as sleep deprivation, depression, and the patient's lack of cooperation with the medical team. Therefore, controlling the anxiety due to pain and the pain due to anxiety is of great importance during the dressing procedure [15]. To control the burn pain opium such as morphine is used, though not effective [16]. The major causes of pain in dressing procedure consist of removing ointment, adhesion of dressing threads, and removing normal gauze from the wound [17, 18].

Burn patient treatment has been considered as a maintenance therapy for years. In burn patients with full thickness burn in which the dermis is completely destroyed, the necrotic tissue is removed with invasive surgery. After the appearance of granulation tissue, skin grafts are used to cover the burned area with a thin layer [19]. Skin grafts are suitable for covering the wound since they both prevent infection and are esthetically satisfactory [20]. Skin grafts lead to infection reduction, wound healing, deformity prevention and wound healing acceleration [21]. It is also an effective method that recompenses burn damage [22], decreases surgery bleeding and increases survival rate of burn patient [23]. The routine time for changing the graft dressing and removing Vaseline Gauze is 48 to 72 hours after the graft surgery [21]. Perhaps delay in changing the dressing of graft and donor site as well as the penetration of moist in the wound site by the dressing leads to adhesion of dressing to the wound and increases the pain and anxiety of the burn patient while dressing. In case we can reduce this pain and anxiety by early change of the graft dressing, we can help the patients have more satisfaction and comfort. Hence, this study was designed to determine the effect of early change of graft dressing on the pain and anxiety of the burn patients.

Methods

This clinical trial study was conducted on two groups containing sixty 18 to 60 year-old burn patients at Burn Ward of Shahid Rajaee Hospital in Qazvin in 2018. Considering other similar studies [16] and their mean and standard deviation, having *p* value of 95% (α=0.05) and power test of 90% (β=0.2), the number of samples was calculated to be 25. Considering 20% drop in the number of samples, it was decided to have 30 patients for each group.

$$n = \frac{(z_{1-\frac{\alpha}{2}} + z_{1-\beta})^2(\sigma_1^2 + \sigma_2^2)}{(\mu_2 - \mu_1)^2} = \frac{(1.96 + 0.84)^2(1.46^2 + 1.38^2)}{1.14^2} = 25$$

Therefore, during the spring and summer of 2018, convenience sampling was done and then the samples were randomly assigned into either intervention or control groups. Inclusion criteria for participation in the study consisted of having undergone skin graft surgery in trunk and extremities, being able to talk, being dressed in routine method, not suffering from mental disorders at present or in the past, not having neurological disorders and numbness in burnt organs, not suffering from severe hearing or visual impairments. Exclusion criteria consisted of being re grafted as well as having facial graft. The written informed consent was obtained from the participants. Variables such as age, sex, burn percentage, burn site, dose of sedative intake, height, and weight were matched in the two groups. It should be mentioned that routine care, consisting of receiving analgesic (5 mg intramuscular Morphine) at the beginning of burn wound dressing was done according to the physician prescription.

Then, in the intervention group, BSPAS was completed by the trained co-researcher and the dressing at the site of donor and graft was changed. While dressing, the VAS was filled out by the same co-researcher. In the control group, graft dressing change was done three days after the graft surgery according to the physician prescription. Similar to the intervention group, the co-researcher completed the BSPAS before dressing and the VAS while dressing. It

Table 1. Comparison of demographic variables' mean among the patients in the two groups

Variable	Groups	Mean	SD	Independent t-test
Age	Intervention	40.4	14.3	T=-1.01
	Control	36.8	13.8	Sig=0.3
Burn percentage	Intervention	12.1	11.5	T=0.9
	Control	14.5	8.8	P<0.36
BMI	Intervention	24.5	3.8	T=0.8
	Control	26.2	3.9	P<0.4
Gender		Male (frequency)	Female (frequency)	X^2=0.02
	Intervention	21	10	P<0.8
	Control	23	10	

Table 2. Comparison of pain and anxiety means among the patients in the two groups

Variable	Groups	Mean	SD	Independent t-test
While-dressing change pain	Intervention	4.2	1.8	T=3.5
	Control	6	1.9	P<0.001
Anxiety pain	Intervention	33.6	11.3	T=4.6
	Control	46.8	11.2	P<0.001

should be mentioned that dressing in both groups was changed by the researcher in the same way.

One of the instruments used in this study was BSPAS which was first developed by Taal and Faber containing a nine-item self-report scale. Each item is answered by the patient ranging from zero (no anxiety) to ten (unbearable anxiety).The total score is calculated by adding up the scores of all items (maximum 90 points) showing the patients' level of anxiety about painful procedures [16]. The content validity of BSPAS was confirmed by Rafiee et al. in a study entitled "The effect of jaw relaxation on pain anxiety of burn dressing: Randomized clinical trial with control group" based on the comments provided by 10 professors of Tehran University. The reliability of this scale was also calculated in this study with α=0.70 [24]. In this scale, the score above the mean (45) indicates severe pain anxiety (3).

To measure the amount of pain, VAS was employed. It is a 100-milimeter (10 centimeter) visual analogue line with 0 at one end meaning no pain and 10 at the other end meaning very severe pain. In this scale the score 0 represents no pain, while 1 and 2 slight pain, 3 to 5 show moderate pain, 6 and 7 indicate severe pain, 8 and 9 severe and finally 10 is the representation of very severe pain. This scale has extensively been used in different studies related to pain and enjoys a high validity and a reasonable index of internal consistency reliability (α=0.91) [25-27].

To analyze the data in this study, SPSS 21 was used and the employed tests were Chi-square to compare the means of contextual variables between the two groups and independent t-test to compare the pain anxiety and burn pain of the two groups.

This study was registered in the Iranian Registry of Clinical Trials (registration number: IRCT20180926041141N1) and approved in the Ethics Committee of Qazvin University of Medical Sciences, Qazvin, Iran (approval code: IR.QUMS.REC.1365.165). Patients were informed about the study aim and ensured of the confidential handling of their information.

Results

The mean ages of the patients in the intervention group and control group were 36.8 and 40.4, respectively. The minimum age for participants was 18 and at most was 59 years. The burn rate was 12.1% in the intervention group and 14.5% in the other one (**Table 1**). At least a percentage of burns was between 2% and 35%. The minimum BMI of participants was 17.8 and at most was 37.8. Chi-square showed no significant differences between the two groups in any of the variables (P>0.05).

The results of the calculations revealed that the mean of anxiety and the pain score of the patients in the two groups were statistically sig-

Table 3. Comparison of pain levels in the two groups

Pain levels	Intervention	Control
	N (%)	N (%)
1-2 weak	6 (19.4)	0
3-4-5 moderate	18 (58)	10 (30.4)
6-7 sever	6 (19.4)	17 (51.5)
8-9 Very sever	0	4 (12.1)
10 Insufferable	1 (3.2)	2 (6)

nificant (P<0.05). As it is demonstrated in **Table 2**, the pain level in intervention group is 4±1.8, while it is 6±1.9 in the control group indicating that while-dressing change pain was moderate in the intervention group, whereas it was severe in the control group (**Table 3**). Furthermore, anxiety level in the intervention group was 33.6±11.3, while it was 46.8±11.2 in the control group, revealing a significant difference between control group and intervention group regarding anxiety. 4 patients (12.9%) in the intervention group had severe pain anxiety before changing the dressing, and in the control group, 21 patients (63.6%) had severe pain anxiety before changing the dressing. Patients in both groups could be discharged from the hospital after dressing change; therefore, early dressing change leads to shorter hospital stay and consequently less medical costs.

Discussion

The findings of this study indicate that the average pain intensity and anxiety in the control group were significantly greater than that of the intervention group. Moreover, it was revealed that early change of graft dressing leads to pain and anxiety reduction in burn patients. The findings of this study were in agreement with the findings of studies that investigated the effect of other non-pharmaceutic methods on the pain intensity of the patients. For example, Taleqani et al. (2014) studied the effect of implementing therapeutic communication plan on burned patients' pain and found out that this plan reduced the pain intensity in patients after dressing change [28]. In the same token, the findings of a study conducted by Rafiee et al. (2010) in which the effect of jaw relaxation on pain intensity of burn dressing was investigated revealed that implementing non-pharmaceutic methods of reducing pain such as jaw relaxation result in reduction in the pain intensity of burn dressing [29]. The related literature shows that a high score in the while-dressing pain influences the patient's coping with the situation one or two years after the accident. Moreover, a high score in the hospitalization pain is a strong predictor in comparison to the size of the burn and the length of hospitalization with regard to psychological complications [29-31]. Therefore, it can be concluded that early change of graft dressing along with pharmaceutical methods for reducing pain can lessen after-burn psychological complications by reducing pain intensity to a great extent [30-32].

In this study, no significant differences were observed in contextual variables such as age, sex, burn size and site, and received analgesic between the control and intervention groups. Thus, the findings of the study are greatly indicative of the positive effect of early change of graft dressing on the anxiety related to dressing pain of burn patients.

There is a reciprocal relationship between burn patients' pain and their psychological problems like anxiety and fear. That is, increase in pain leads to increase in anxiety and fear which in turn brings about pain in the patients while performing treatment and care procedures. Anxiety not only destroys the physical function of the burn patient by increasing the pain intensity, but also is a threatening factor in the process of burn injuries wound healing because it is a potential factor affecting wound healing both psychologically and physiologically [33, 34]. Acute pain which is not comforted increases the after-burn stress, leads to dissatisfaction and discomfort of the patient, delays healing, prolongs hospitalization, and creates problems in receiving treatment procedure [28]. Therefore, it can be said that by early change of graft dressing and reducing anxiety and pain in patients, we can reduce the length and costs of hospitalization and increase the patients' satisfaction.

Conclusion

Since the maximum amount of pain and anxiety in burn patients is due to treatment procedure such as cleansing the wounds and dressing, one of the best ways to decrease them in these patients is finding a method by which pain can be reduced. The results of this study revealed that early change of graft dressing will consid-

erably reduce the anxiety related to dressing pain which in turn leads to less hospitalization length and higher satisfaction of burn patients. It can also reduce the anxiety related to the hospital. Furthermore, earlier discharge from hospital lessens the risk of developing hospital infection.

Limitations of the study

Different pain threshold in different people and different effects of analgesics on them can be considered as the limitations of this study; we controlled it by random sampling and homogenizing the two groups in their demographic characteristics.

Disclosure of conflict of interest

None.

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