Original Article

Outcome of Combined Use of Topical Coconut Oil and Oral Gabapentin to Control Post-Operative Itching on Split Thickness Graft Donor Site

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ABSTRACT

Objective: To determine the efficacy of combined use of topical coconut oil with oral gabapentin to control post-operative itching on split thickness skin graft donor site.
Study Design: Descriptive case series
Place and Duration of Study: This study was conducted at the Jinnah Burn & Reconstructive Surgery Centre, Lahore from June 2014 to December 2015.
Materials and Methods: 65 patients having itching over donor site for split thickness skin graft after healing of the wound. Patients having Itch man's score more than 2 were given topical coconut oil three times a day to massage over the donor area. At the same time, patient should use oral gabapentin 300 mg at night on first day, 300 mg 12 hourly on 2nd day and 300 mg 8 hourly on 3rd day. Itching was assessed after one week of start of therapy and efficacy was noted as yes or no.
Results: Efficacy (Itch man's score is 0 after one week start of therapy) was seen in 41 (63.08%) patients while remaining 24 (36.92%) had shown no efficacy.
Conclusion: This study concluded that efficacy of combined use of coconut oil and gabapentin to control itching at donor site of split thickness skin graft is very high.
Key Words: split thickness graft, coconut oil, itching, gabapentin.

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INTRODUCTION

Split thickness skin auto grafting is most widely used technique for covering deep burn wounds & extensive soft tissue defects. Itching has been reported to be one of the most distressing symptoms of healed donor grafted skin [1,2,3,4]. It cause great distress in recovering patients affecting their ability to concentrate and thereby their ability to function well in everyday life. It may also disrupt sleep, which is vital to recovery after a major trauma and scratching may damage the newly developed skin. Itching during the early stages of healing is attributed to mast cell histamine release directly as part of the inflammatory response to injury and indirectly secondary to collagen formation during the proliferative stage of wound healing[5].The current management of itching relies on the use of emollients and sometimes oral antihistamines[6,7,8]. Emollients exert their skin softening and moisturizing effect within the stratum corneum. They help to restore the epidermal barrier and thereby prevent the penetration of environmental triggers that may cause an inflammatory reaction[9]. Emollients include menthol 11%, oatmeal based agents, calamine lotion, aloe and camphor and coconut oil. Hopper and colleagues presented a comparative study in 2012 between application of calamine oil and coconut oil. They used four points 'Itch man score' and found that coconut oil has more prolonged effect on itching than calamine oil. The coconut oil decrease itching from pre application 'itch man score' of 2+- 0.74 to 0.73+- 0.64 after four hours of application[10].

Gabapentin has been described in treatment of pruritus due to different causes in many studies[11,12]. Gabapentin involves interaction with the alpha 2 and delta subunit of voltage-gated calcium channels and thereby inhibition of high-threshold neuronal calcium channels. Other proposed mechanisms of action include potassium channel activation to effect membrane hyper-polarization and selective agonism at GABA-

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B receptors to inhibit excitatory neurotransmitter release[13]. Effectiveness of gabapentin in post burn pruritus was described by Ahuja and colleagues [14]. Goutos et al[15]conducted a study in 2010 to compare different anti-pruritic efficacy in burn patients and found gabapentin produce 'itch man score' of 0 in 41.46 % of the patients.

Since, previous studies showed that the coconut oil is one of the most effective emollients to reduce itching but after its application still some of the patients felt discomfort. Similarly, gabapentin has also been successfully used to treat the given problem but a group of patients also felt pruritus after its usage. So, theoretically combined use of topical coconut oil and oral gabapentin should produce more comfort to the patient and improve their quality of life. As there was lack of literature on combined use of coconut oil at donor site and oral gabapentin to control post-operative pruritus, so we conducted this study in order to determine outcome of combined use of topical coconut oil and oral gabapentin to control itching at donor site of split thickness skin graft.

MATERIALS AND METHODS

This was a descriptive study conducted at Jinnah Burn & Reconstructive Surgery Centre, Lahore from 13 June 2014 to December 2015. Sample size of 65 cases had been calculated with 95% confidence level, 12% margin of error and taking expected efficacy as 41.46%[7] by using following formula.

$$samplesize = n = (Z\_(1-\alpha/5\,P(1-P)\ \ )\text{^}2)/d\text{^}2$$

Itching was assessed by 5 points 'Itch mans score'.(it is subjective score assessed by the patient) and score ≥2 was taken as positive.

0-represents a comfortable patient with no itch,1- little itch not interfering with activity,2-more itch sometimes interfering with activity,3-a lot of itch, which makes lying still and concentration difficult,4-most terrible itch making it impossible to sit still and concentrate.

After approval from the ethical committee, all the patients presenting in the outpatient department with complaints of itching over the donor site of split thickness skin graft were asked to categorize their itch according to "Itch man's score". Patients with score of 2 or more, age between 12 to 60 years and of both genders were included in the study. Patients having score less than 2 or mentally retarded patients were excluded. After informed consent patient identification and demographic data was collected. Protocol for application of coconut oil and intake of gabapentin and assessment sheet to record itching scores before intervention and at 2, 4 and 6 hours after the treatment were explained to the patient. Topical coconut oil applied three times a day over the donor area and the application procedure include hand washing, donning gloves, exposing the affected area, cleaning of the area with sterile water, pat drying and application of lotion. The validity of all these tools was established. At the same time, patient should use oral gabapentin 300 mg at night on first day, 300 mg 12 hourly on 2nd day and 300 mg 8 hourly on 3rd day and then continue the same dose for the subsequent period of time. Efficacy of treatment was assessed by 5 points 'Itch mans score as described above after one week start of therapy and efficacy was taken as yes if score = 0, otherwise taken as no.The collected data was entered and analyzed by using SPSS version 20.

RESULTS

Age range in this study was from 12 to 60 years with mean age of 35.66 ± 12.08 years as shown in Table I. Majority of them were males with male to female ratio of 1.8:1 as shown in figure 1. Percentage of patients according to donor site is shown in Figure 2. Efficacy was seen in 41 (63.08%) patients while remaining 24 (36.92%) had shown no efficacy as shown in figure 3. Stratification of efficacy with respect to age groups & gender has shown in Table 2 & 3 respectively which showed statistically no significant difference among different groups. Table 4 has shown the stratification of efficacy with respect to donor site which also showed statistically no significant difference among different groups.

Table No.I: Distribution of patients according to Age (n=65).

Age (in years)	No. of Patients	%age
12-30	21	32.31
31-45	31	47.69
46-60	13	20.0
Total	65	100.0

- **Mean ± SD = 35.66 ± 12.08 years**

Table No.2: Stratification of Efficacy with respect to age groups.

Age (in years)	Efficacy		P-value
	Yes	No	
12-30	14 (66.67%)	07 (33.33%)	0.918
31-45	19 (61.29%)	12 (38.71%)	
46-60	08 (61.54%)	05 (38.46%)	

Table No.3: Stratification of Efficacy with respect to Gender.

Gender	Efficacy		P-value
	Yes	No	
Male	29 (69.05%)	13 (30.95%)	0.178
Female	12 (52.17%)	11 (47.83%)	

Table No.4: Stratification of Efficacy with respect to donor site

Donor Site	Efficacy		P-value
	Yes	No	
Thigh	22 (59.46%)	15 (40.54%)	0.900
Buttocks	10 (66.67%)	05 (33.33%)	
Back	06 (66.67%)	03 (33.33%)	

Scalp	03 (75.0%)	01 (25.0%)	

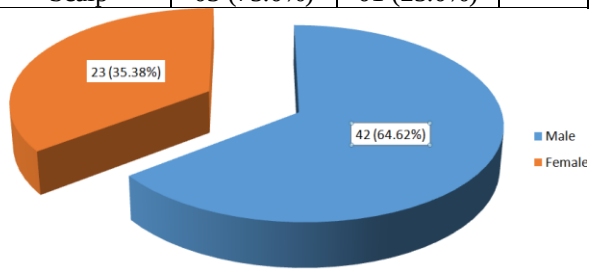

Figure No.I: Distribution of patients according to gender (n=65)

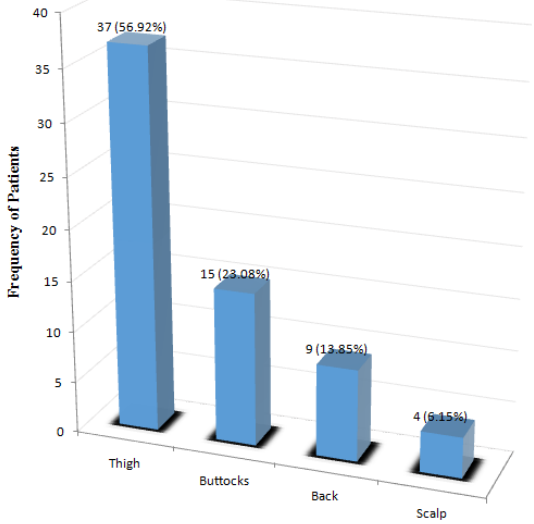

Figure No.2: Distribution of patients according to Donor site (n=65).

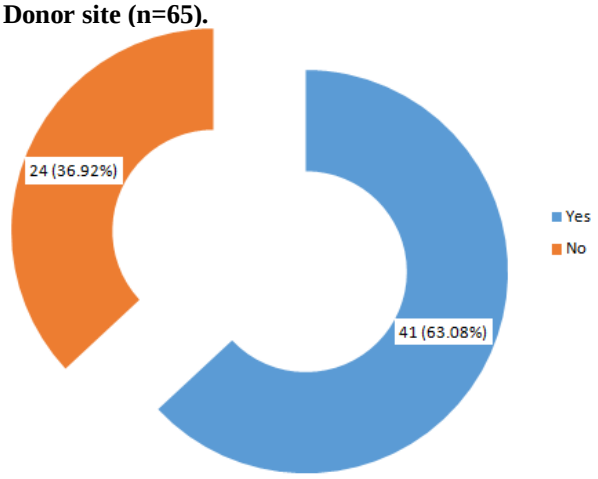

Figure No.3: Distribution of patients according to Efficacy (n=65)

DISCUSSION

Most of the patients with 3rd and 4th degree burns require split thickness skin graft. Donor sites for skin graft include thigh, buttocks, trunk and scalp. Donor sit of split thickness skin graft usually heals within two weeks. One of the complications of donor site, once it heal is itching. This may produce not only local discomfort, sleep disturbance, wound over the healing site due to scratch but also psychological disturbances. Although local emollients are widely used and overcome this problem, but some of the patients require antihistamine and other drugs such as gabapentin to reduce this pruritus.

The present study was conducted to assess the effectiveness of cumulative effect of topical coconut oil and oral gabapentin. In our study efficacy of combined use of topical emollient and oral gabapentin was seen in 41 (63.08%) patients while remaining 24 (36.92%) had shown no efficacy. Our results were contradictory to results shown by Hopper and colleagues. They presented a comparative study in 2012 between application of calamine oil and coconut oil. They found that 76.7% of their patients using only coconut oil were relieved of itching[4]. There was a major difference in percentage of patients relieved of itching in our study (63.08%) and the study mentioned previously (76.7%). One of the possible reason for such a difference could be difference in male to female ratio in sample size. In our study, 64.62% of our patients were male and 36.92% were females. In study by Hopper and colleagues, 76.7% patients were male and remaining were females.

The relationship of gender to itch is still a controversial issue. In the present study no statistical significant relationship was found between gender and itching scores. But in an epidemiological study of itching conducted by Van Loeyet al[15]it was demonstrated that the female gender developed more itching than their counterparts .The finding that women had higher itching scores cannot be explained without some speculation. One explanation could be that women are more prone to develop emotional problems than their counterpart and therefore associated with the reporting of persistent itching.

However, our results were very much better than study conducted by Goutos et al[16]. In 2010 they compared different anti-pruritic efficacy in burn patients and found gabapentin produce ‘itch man score’ of 0 in 41.46 % of the patients. Since, we used both topical emollient applications along with gabapentin instead of oral gabapentin alone as done by Goutos and colleagues, so combination of both topical and oral remedies produces a significant difference. The significant difference of 21.52% (63.08% in our study and 41.46% in other study) support rationale of our study that combined use topical coconut oil and oral gabapentin produces superior results.

There are studies which found some complications of gabapentin. A pilot study in 2004 investigated the use of gabapentin in 35 children aged between 6 months and 15 years with healing, intensely pruritic burns wounds[17] . There was marked reduction in itching . They found three children developed behavioral problems and in one this necessitated discontinuation of gabapentin. At follow-up, it was found that some

patients had stopped the drug as early as 4 weeks after starting treatment and others with hypertrophied wounds had taken it for up to 18 months. We did not record any such behavioral problem, incompliance or hypertrophic scarring after prolonged use. The possible reason should be that we excluded the children less than 12 years of age in our study.

The drawback of our study was that there was no equal distribution of males and female gender. From the difference between our study and other, we recommend further studies should be performed with equal distribution of male to female ratio.

CONCLUSION

This study concluded that the efficacy of combined use of coconut oil and gabapentin to control itching at donor site of split thickness skin graft is very high. So, we recommend that combined use of coconut oil and gabapentin at donor site of split thickness skin graft should be opted in our routine practice guidelines for controlling post-operative itching and reducing the morbidity and of these particular patients. Moreover, further studies are recommended in which there should be equal distribution of males and females to rule out gender bias.

Author's Contribution:

Concept & Design of Study:	Husnain Khan
Drafting:	Bilal Ahmed Qureshi
Data Analysis:	Muhammad Waqas, Zulfiqar Ranjha
Revisiting Critically:	Husnain Khan, Bilal Ahmed Qureshi
Final Approval of version:	Husnain Khan

Conflict of Interest: The study has no conflict of interest to declare by any author.

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