ORIGINAL ARTICLE

COMPARING THE EFFECTIVENESS OF PLAIN CREPE DRESSING VERSUS $MgSO_4$ DRESSING IN PATIENTS WITH CELLULITIS

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ABSTRACT

Objectives: To compare the efficacy of plain crepe dressing versus $MgSO_4$ dressing in patients with cellulitis.

Methods: This Randomized Controlled Trial (RCT) was carried out in the General Surgery Department of PAEC General Hospital, Islamabad. Around 60 patients having cellulitis were enlisted in the study. Patients were divided in two groups by block randomization, group A (crepe dressing) group B ($MgSO_4$ dressing). Efficacy was determined in terms of symptoms resolution after seven days of dressing.

Results*:* Total 60 patients, 30 in each group were enlisted in the study including 36 (60%) male and 24 (40%) female. The mean ages of the patients were 39.53 +/- 11.22 years and 41.17 +/- 13.17 years in group A and B respectively (p-vale > 0.05). The efficacy was 30.0% in group and 63.3% in group B with (p-value 0.010).

Conclusion*:* The study deduced that MgSO4 dressing is more effective than plain crepe dressing in treating patients with cellulitis. This finding has important implications for clinical practice, as it suggests that $MgSO_4$ dressing may be a more appropriate treatment option for patients with this condition.

Keywords: Cellulitis, Crepe dressing, Magnesium sulphate dressing, Bacterial infection

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INTRODUCTION

Cellulitis commonly pans out as an ill-defined area with calor, rubor associated swelling and dolor on touch .It is an acute bacterial infection that leads to inflammation of the deep dermis and nearby tissue that lies beneath the skin [1]. The infection does not have any pus accumulation or discharge. Infection caused by Beta-hemolytic streptococci mostly group A streptococcus (i.e., S. Pyogenes), followed by methicillin-sensitive Staph Aureus leads to cellulitis [2]. Patients with low immunity who are inhabited with methicillin-resistant Staph Aureus, mouthed by animals, or have multiple chronic conditions such as type 2 diabetes can catch and get affected with other microorganisms [3]. The skin acts as shield that obviate resident skin flora and other harmful microorganisms from reaching the subcutaneous tissue and lymphatic system. When there is a crack or disruption in the skin, the resident skin flora and other microbial pathogens gets entry into the deeper tissues of skin and its nearby area causing cellulitis [4]. Risk factors for cellulitis include any factor that could breach the skin barrier such as any trauma causing skin injury, surgical incisions, cannula site punctures, skin tearing or cracks between toes, insect or animal bites, and other skin infections [5]. Patients with comorbidities such as mainly type 2 diabetes mellitus, peripheral arterial disease, lymphedema, venous insufficiency are more prone of getting

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cellulitis [6].

Magnesium Sulfate solution is commonly being used as a soaking agent for painful joints, strains, and sprains, etc. [7]. The primary mechanism of action of Magnesium sulfate is by creating an osmotic gradient; means the numbers of electrolytes are in the dressing than inside the edematous tissue, so water has to be drawn into dressing from the tissue to maintain the equilibrium [8]. In this way it decreases the swelling of limb caused by cellulitis. It is also seen hat magnesium reduces the inflammation of the tissue; it improves functioning of nerve and muscle and helps to obviate arterosclerosis [9]. Sulfates speedily absorb the nutrients into the cells and clean the toxin from the body effectively [8]. In a study by Singh, et al. has shown that efficacy of $MgSO_4$ dressing was 17.6% as compare to 5.1% with plain crepe dressing in cellulitis patients [9]. In another study by Suhas, et al. has shown the efficacy of $MgSO_4$ dressing was 3.2% as compare to 42.9% with plain crepe dressing in patients with cellulitis [10]. There is no similar study that has been done before in our general population. There is also shortage of data on this topic t in international literature. Due to variability of result in this regard it is difficult to imply this data on our general population as one study claim effectiveness of $MgSO_4$ dressing [9] while other shows good response to plain crepe dressing in cellulitis patients [10]. This study was chosen and done with the aim to compare the effectiveness of plain crepe dressing and $MgSO_4$ dressing in patients with cellulitis. Analysis of our study will help to select better and effective mode of treatment in managing the patients with cellulitis.

METHODOLOGY

It was a Randomized Controlled Trial (RCT), conducted in General Surgery Department of PAEC General Hospital, Islamabad. The duration of study was from July /2021 to Jan 2022. Sample size was estimated by WHO calculator with level of significance = 5%, Power = 80%. Using expected efficacy of $MgSO_4$ dressing was 3.2% as compare to 42.9% with plain crepe dressing in patients with cellulitis.[10] Sample size= 34 but we used 60 sample size (30 in each group),by non-probability consecutive sampling technique. Ethical committee approval was taken by all members of committee of PAEC hospital, prior to initiation of research. The inclusion criteria were age 20 to 60 years. Both genders will be included. Cellulitis as per operational definition for duration of more than a week while the exclusion criteria include H/o hypertension, H/o diabetes mellitus and H/o acute or chronic renal diseases The aforementioned comorbidities can act as lurking variables and if included will influence the study results.

Patients fulfilling the study criteria from General Surgery Department of PAEC General Hospital Islamabad were included in the study after seeking consent from ethical review board committee. At study entry baseline demographics (Age, gender and duration of complaint) were recorded. Randomization was performed by block randomization. 30 sample sizes for plain crepe dressing group (Group A) while 30 sample sizes for $MgSO_4$ dressing group (Group B). In group A, after cleaning the area of cellulitis with betadine solution, the inflamed area was covered by plain crepe, soaked with normal saline, bandage applied over it and patient was advised rest with the elevation of the affected area.

RESULTS

Out of total 60 patients, 30 in each group were enlisted in the research including 36 (60%) male and 24 (40%) female. In the Group A (crepe dressing group), 17 (56.7%) were male and 13 (43.3%) were female whereas in Group B ($MgSO_4$ dressing group), 19 (63.3%) were male and 11 (36.7%) were female (p-value > 0.05) The mean age of the patients in group A was 39.53 +/- 11.22 years whereas the mean age in group B was 41.17 +/- 13.17 years (p-vale > 0.05). We categorized patients into four age groups. In group A, 7(23.3%) patients were < 30 years old, 12 (40.0%) were in 31-40 years age group, 5(16.7%) were in 41-50 years age group and 6(20.0%) were in 51-60 years age group.

Similarly In group B, 9 (26.7%) patients were < 30 years old, 8 (26.7%) were in 31-40 years age group, 4 (13.3%) were in 41-50 years age group and 9 (30.0%) were in 51-60 years age group (p-value > 0.05) as shown in table 1 .

Table 1: Comparison of Gender Between the Groups

Gender	Groups		P-value
N	30		
	Crepe dressing	MgSO4 dressing	
Male	17(56.7%)	19(63.3%)	
Female	13(43.3%)	11(36.7%)	0.598
Age (years)	39.53 ± 11.22	41.17 ± 13.17	0.607
< 30 years	7(23.3%)	9(30.0%)	
31-40 years	12(40.0%)	8(26.7%)	0.623
41-50 years	5(16.7%)	4(13.3%)	
51-60 years	6(20.0%)	9(30.0%)	

In group A, the duration of symptoms was 2 weeks in 17 (56.7%) of the patients and 3 weeks in 13 (43.3%) of the patients whereas in group B, the duration was 2 weeks in 14 (46.7%) of the patients and 3 weeks in 16 (53.3%) of the patients (p-value > 0.05).

The efficacy was 30.0% (9/30 patients) in group A and 63.3% (19/30 patients) in group B. The difference in efficacies between the groups was statistically significant with a p-value of 0.010.

Table 4: Comparison of Symptoms Duration in the Groups

Variables		Groups		P-value
		Crepe dressing	$MgSO_4$ dressing	
Symptoms	2 weeks	17(56.7%)	14(46.7%)	
duration	3 weeks	13(43.3%)	16(53.3%)	0.438

DISCUSSION

Cellulitis is a common bacterial skin infection that requires prompt and effective treatment to prevent complications [11]. The use of appropriate wound dressings is an important aspect of managing cellulitis [12]. We performed this research to compare the effectiveness of plain crepe dressing vs $MgSO_4$ dressing in treating patients with cellulitis. We found

no significant differences between the two groups with respect to patient demographics, including age and gender. The mean age of patients was similar in both groups, and the distribution of age groups was comparable. The duration of symptoms was also similar in both groups, with most patients experiencing symptoms for two or three weeks. Our primary finding was there is a substantial difference in effectiveness between the two dressings. The $MgSO_4$ dressing was found to be significantly more effective than plain crepe dressing, with a difference of 33.3%. This finding is clinically significant and suggests that $MgSO_4$ dressing may be a more appropriate option for managing cellulitis in patients. The results of our study are persistent with the study of Singh, et al. in which the efficacy of MgSO4 dressing was 17.6% as compared to 5.1% with plain crepe dressing in patients with cellulitis [9]. However our study contradicts the results of study by Suhas, et al. which has shown that efficacy of $MgSO_4$ dressing was 3.2% as compared to 42.9% with plain crepe dressing in patients with cellulitis [10].

The basic mechanism of $MgSO_4$ dressing is that it has more electrolytes than present in the swollen tissue, due to the creation of an osmotic gradient, which causes water to be pulled into the dressing even when electrolyte equilibrium may be approached. That is how the edema is diminished. Magnesium has been demonstrated to lessen inflammation, enhance nerve and muscle function, and assist preventing arteriosclerosis. Sulphates effectively cleanse the body and hasten the uptake of nutrients into cells [8].

When we stratified efficacy by age and duration of symptoms, we found no significant differences between the two groups. However, when we stratified efficacy by gender, we found a significant difference in group B. The other studies mentioned in literature failed to demonstrate this finding [9,10]. This finding suggests that gender may play a role in the efficacy of $MgSO_4$ dressing, but further research is needed to explore this potential relationship.

There are many constraints to our study that should be addressed. First, the sample size was comparatively small, which may restrict the general applicability of our findings. Second, there may have been some selection bias in the recruitment of patients, which could have influenced the results. Third, we did not assess the potential risks or benefits of each dressing option, which may also be important considerations in clinical practice.

CONCLUSION

The study concluded that $MgSO_4$ dressing is more effective than plain crepe dressing in treating patients with cellulitis. This finding has important implications for clinical practice, as it suggests that $MgSO_4$ dressing may be a more appropriate treatment option for patients with this condition. For future research, it may be beneficial to investigate the mechanisms underlying the superior efficacy of $MgSO_4$ dressing, as well as to explore the potential benefits of combining $MgSO_4$ dressing with other treatment modalities. Additionally, further studies could examine the side effects and long-term outcomes of patients treated with $MgSO_4$ dressing, in order to determine whether its benefits are sustained over time.

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Author's Contribution:
HS: Concept & design, statistical analysis, data collection and manuscript writing, final approval of manuscript
AS: Concept & design, final approval of manuscript, responsible for integrity of research
SK: Concept & design, drafting and data collection
AAM: Concept & design, drafting, responsible for integrity of research
KJ: Concept & design, data collection, responsible for integrity of research

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