Open versus Closed Sandwich Wound Dressing Method in Burn Children.

P. Oduor, MMed Surgery, FCS(ECSA)
Surgeon, Rift Valley Provincial General Hospital, Nakuru, Kenya. Email: <oduorpr@craterclimb.co.ke>

Background: Open method of dressing burn wounds has been the accepted mode of burn wound care in most of our hospitals. Closed dressing has been shunned because of the belief that it is costly and labour intensive.
Methods: A retrospective study was conducted on 170 children under 12years admitted to the Pediatric surgical/female burn ward between the months of June 2006 to March 2007. A comparison was made between the open and closed sandwich method of burn wound dressing. The sandwich method entailed using 17 by 17cm square pieces of gauze with a layer of cotton in between. The dressing was left on for between 3 and 4 days. The open method was used on 92 patients (Group A) admitted between the months of June 2006 to October 2006, while the closed method was applied on 78 patients (Group B) admitted during the months of November 2006 to March 2007.The demographic data of the two groups were analyzed. The duration of hospital stay, fatalities and proportion of patients discharged were used as outcome indicators for the two groups.
Results: The male to female ratio was found to be 1.4:1 for Group A and 1.5:1 for the Group B. The majority of burn wounds were caused by scalds with children under five being the most affected in both groups (81.5% and 85.9% respectively). Most of the burns in the two groups were less than 10% of the body. The results of outcome indicators showed no statistical differences between the two groups.
Conclusion: Sandwich closed dressing changed every after three to four days does not adversely affect outcome of burn patients. This type of dressing is recommended for health facilities with limited resources since it reduces the burden on the nurse and also the cost of dressing materials while providing the benefits of closed dressing.

Introduction

Burns are the most frequent injury among pediatric patients[1]. In addition, the long and painful scar treatment comes with significant financial burden for parents and society[2]. Burn care in Africa is very dependent on the availability of financial resources, equipment and expertise[3]. Burn wounds in Africa are treated according to the open method because regular dressing changes were found to be labor intensive and costly[4]. The dressing is sometimes left to the caretaker. The closed method of dressing burn wounds is now universally accepted for partial thickness burn wounds as it has less pain and also provides a moist environment which enhances wound healing[5]. It also allows for mobility of the patient. This method has been considered expensive because of the frequent dressing changes. The objective of this study was to find out if the closed method of burn wound dressing could be used in our set up.

The sandwich method was used here where between two gauze layers is a layer of cotton wool to provide the bulky absorptive layer. The utilization of cotton wool for bulk reduces the amount of gauze required and hence the cost. From one roll of gauze about 17 pieces of this dressing material can be made (Figure 1). The dressing was applied after applying silver sulfadiazine to the wound. The dressing was maintained for between three and four days and only changed when the outer layer was wet (Figure 2). The ward where the study was conducted normally admits all pediatric surgical patients together with female adult burn patients.

On average the ward admits 680 patients a year out of which 170 patients (25.7 %.) are pediatric burn patients. There is a perpetual shortage of nurses; hence the burden on them is heavy. The staffs have to take care of other patients besides caring for the burn patients. This picture is

similar in most public hospitals across the region. To provide quality care a method of dressing not requiring daily changes would be ideal.

Patients and Methods

Medical records of pediatric burn patients (age less than or equal to 12years) admitted to the wards between June 2006 and March 2007 were reviewed retrospectively. In June 2006 to October 2006 the open method was being practiced while from November 2006 to March 2007 it was the closed method. Patient demographics, etiology, burn extent, anatomical areas, length of hospital stay and mortality were recorded. Statistical analysis of the data was performed using the SPSS statistical package.

Results

The patients treated between June 2006 and October 2006 were considered as Group A while the treatment group after October 2006 Group B. In both groups the most common cause of burns was scald (Table 1) with the age group affected being the under five years (Table 2). The total burn surface area in both groups was mainly 10% with a smaller group sustaining burns of between 10% and 19%.The mean was 10.32% for the open and 8.46% for the closed method (Table 3). The distribution of burn sites were similar with the commonest the being upper limbs and trunk (Figure 3). Statistical analysis of these parameters showed no differences when chi square was calculated. This could imply that despite the patients being treated at different time intervals they were affected in the same way.

Figure 1. The sandwich dressings

Figure 2. A Child with anterior trunk burns dressed using the sandwich method

A total of 70% of patients in the open method of dressing stayed in the ward for two weeks while in the closed method it was 63% (Table 4).The mean duration of hospital stay was 11.07(10.17) and 10.13(6.97) respectively. 91.3% of the patients in the first group were eventually discharged against 85.9% in the second group (Table 5). The fatalities were 7.6% for the open dressing group and 12.8% for the closed dressing ones (Table 5). Once again there were no statistical differences between the two groups as far as the outcome indicators were concerned.

Table 1. Causes of burns

			Cause of burn		
			Scald	Fire	Total
Group	A	Count	77	15	92
		% within Time	83.7%	16.3%	100.0%
		% of Total	45.3%	8.8%	54.1%
	B	Count	72	6	78
		% within Time	92.3%	7.7%	100.0%
		% of Total	42.4%	3.5%	45.9%
Total		Count	149	21	170
		% within Time	87.6%	12.4%	100.0%
		% of Total	87.6%	12.4%	100.0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	2.892	1	.089

Table 2-Age

Crosstab

			Group		
			A	B	Total
Categorical Age	Under five year	Count	75	67	142
		% within Time	81.5%	85.9%	83.5%
	5 to 12 years	Count	17	11	28
		% within Time	18.5%	14.1%	16.5%
Total		Count	92	78	170
		% in Time	100.0%	100.0%	100.0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	.587	1	.443
N of Valid Cases	170		

Table 3-Burn extent

Crosstab

			Group		
			A	B	Total
Categorical percentage burn	Less than 10%	Count	54	51	105
		% within Time	58.7%	65.4%	61.8%
	10% to 19%	Count	29	25	54
		% within Time	31.5%	32.1%	31.8%
	More than 19%	Count	9	2	11
		% within Time	9.8%	2.6%	6.5%
Total		Count	92	78	170
		% within Time	100.0%	100.0%	100.0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	3.709	2	.157

Table 4- Duration of hospital stay

Crosstab

			Group		
			A	B	Total
Category days	1 week	Count	41	36	77
		% within Time	44.6%	46.2%	45.3%
	2 weeks	Count	29	27	56
		% within Time	31.5%	34.6%	32.9%
	3 weeks	Count	13	9	22
		% within Time	14.1%	11.5%	12.9%
	4 weeks	Count	5	4	9
		% within Time	5.4%	5.1%	5.3%
	More than 4 weeks	Count	4	2	6
		% within Time	4.3%	2.6%	3.5%
Total		Count	92	78	170
		% within Time	100.0%	100.0%	100.0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	.753	4	.945

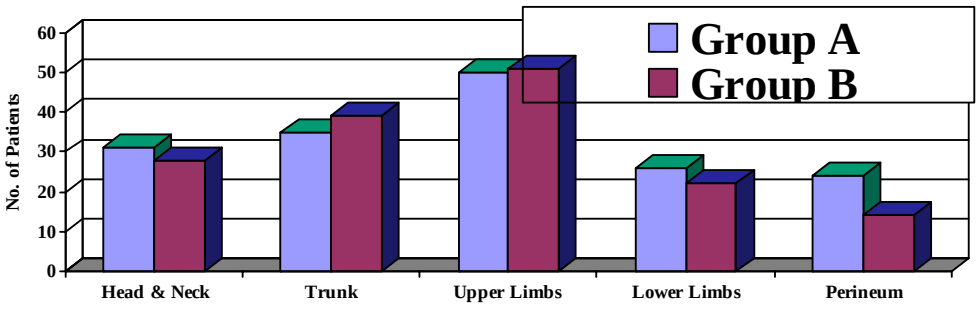

Fig.3 - Site of burn

Table 5- Outcome

Crosstab

			Group		
			A	B	Total
Fatality	Death	Count	7	10	17
		% within Time	7.6%	12.8%	10.0%
	Referred/Abscoded	Count	1	1	2
		% within Time	1.1%	1.3%	1.2%
	Discharged	Count	84	67	151
		% within Time	91.3%	85.9%	88.8%
Total		Count	92	78	170
		% within Time	100.0%	100.0%	100.0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	1.299	2	.522

Discussion

The most common age group affected was the under 5years[6,7]. This corresponds to studies in other countries like Brazil, Ghana, China, and India where this age group was found to account for a disproportionately higher number of burns. Scalds constituted the commonest cause at more than 80% in both groups. This is the picture in most studies[8,9,10]. The TBSA in both groups was mainly 10% with a smaller group sustaining burns of between 10% and 19%.The mean was 10.32% (±8.23) for the open method and 8.46%(± 5.37) for the closed method.

The distributions of burn sites were similar in both groups with the upper limbs and trunk being the commonest. This can be explained by the fact that children under 5 years and especially toddlers sustain burns as they reach objects as part of their curious nature[11]. A study at the University of Calabar Training Hospital, Nigeria had a different picture where the trunk was the commonest site[12]. The high incidence of burns in the trunk and limbs which are easy to dress makes this method amenable for use in most pediatric burns. Perineal and face wounds were not dressed using the closed method because of fear of contamination.

Seventy percent (70%) of the patients in the open method of dressing stayed in the ward for a week while in the closed method it was 63%.The mean duration of hospital stay was 11.07(±10.17) and 10.13(± 6.97) days respectively. A study on 1494 pediatric burn patients in Shanghai, China found a mean hospital stay of 16.1(±12.2) days[13] implying that our hospital stay was within the range of other countries despite utilizing the sandwich method with infrequent dressings; 91.3% of the patients in the first group were eventually discharged against 85.9% in the second group. Statistical analysis did not reveal a significant difference between the two outcomes. The mortality rates were 7.6% for the open dressing group and 12.8% for the closed dressing group. The higher figure for the closed method could have been due to teething problems since the method had just been introduced. However, no statistical difference was noted but the figures were high compared to the Shanghai, China study of 1.1%[13]. The mortality rate compared with an average of 9.9% found in many low and middle income countries[14].

Conclusion and Recommendations

Closed dressing with dressing changes every three to four days does not adversely affect outcome of pediatric burn patients.

The benefits of closed method of dressing can be gained by using this sandwich method. This method of dressing is affordable, has less pressure on nurses and also allows mobility of children in the ward. It is a method which can be useful in third world countries where resources are limited.

Further studies will be required to see if the outcome will improve with time.

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