

## ORIGINAL ARTICLE

# Prevalence of Rejection of Skin Grafts in Type 2 Diabetic Patients with Deep Burns. A Comparative Cross Sectional Study

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## ABSTRACT

The aims and objectives of current study were to provide best surgical services to diabetic burn patients by identifying their after skin graft complications. Focus was essential on the process of burn treatment with an emphasis on early excision and grafting. The frequency percentage mean standard deviation of percentage of burn, random diabetes levels, burn grade, burn surface area and TBSA in Group A ( $2.5 \pm 1.6, 10 \pm 1.4, 1 \pm 1.0, 4 \pm 2.1, 2 \pm 1.6$ ) and Group B ( $4.1 \pm 2.4, 16 \pm 2.7, 1.6 \pm 1.5, 6 \pm 3.1, 4 \pm 1.8$ ) were calculated respectively. Similarly the rejection of skin grafts mean standard percentage deviation of diabetic and non-diabetic patients were ( $32.12 \pm 11.12$ ), ( $15.10 \pm 12.15$ ). The results of this study were highly significant ( $<0.005$ ) and remarkable complicational changes were noted in the variables of diabetic than non-diabetic patients.

## INTRODUCTION

A surgical procedure in which removing skin from one area of the body transplants to any other area of the body is referred as skin grafting. In the specialty of plastic surgery this procedure is adopted when protective covering of skin damaged because of burns, injury or any illness [2]. Healthy skin taken from donor site of the body and grafted on damage area, in skin grafting upper two layers of healthy skin i.e. epidermis and dermis were taken for surgical procedure. In case of deeper tissue loss patient to need of full-thickness skin graft for this purpose entire thickness of skin is required instead of only two upper layers [1]. Skin grafting may be split-thickness graft or full-thickness graft involves.

In split-thickness graft epidermis and dermis are taken from the donor site of healthy skin and this method is used to cover large areas [3]. These grafts tend to be fragile and typically have a shiny or smooth appearance and its appearance is paler than the adjoining skin. Split-thickness grafts cannot grow like non grafted skin therefore in children additional grafts required. In case of full-thickness graft both epidermis and dermis layers taken from the donor site mostly from abdomen are [5]. This is a surgical technique in which small pieces of skin grafted together and closed in a straight-line incision with stitches or staples. Full-thickness grafts are generally used for small wounds on highly visible parts of the body, such as the face. Unlike split-thickness grafts, full-thickness grafts blend in well with the skin around them and tend to have a better cosmetic outcome [7].

Diabetes mellitus is a carbohydrate metabolic disorder in which glucose levels of the biological system become high than the normal levels [4]. Insulin is a hormone produced by the beta cells of the pancreas. The abnormalities of carbohydrate metabolism started because of less amount of insulin than the requirements [6]. Untreated high blood sugar from diabetes can damage your nerves, eyes, kidneys, and other organs. In many studies it has proved that in diabetic patient recovery rate

of wounds and chances of infections in clean wounds are higher than non-diabetics. The positive blood culture in a patient without a fever is referred as bacteremia, occurred due to increase in white blood cell count [3]. In diabetic burn wounds the infection mostly caused by multiple organisms, including streptococcus, proteus, pseudomonas and methicillin-resistant Staphylococcus aureus (MRSA), enterococcus and enterobacter [2].

## MATERIALS AND METHODS

Present study was cross-sectional and conducted in different burn units. The selected burn diabetic patients for this study were retrospectively examined about one year regarding their diabetic levels and after skin grafts complications. For this study the selection criteria was low extremity burn, age and diabetes. Total 72 patients were selected and divided them into two groups in Group A, 30 patients were of age in-between 20 to 30 years and they were all non-diabetics. In Group B, 42 diabetic patients were of age in-between 20 to 30 years selected.

Percentage of burn, type and levels of diabetes, grade of burn and total burn surface area (TBSA) retrospectively were the variables. Mean follow up period was 12 months. Raw data were collected in a pre-designed questionnaire Performa and for biostatistical performance the SPSS 21 software was applied and significant (0.005) p value was considerable. After skin grafts complications were main regression parameter.

## RESULTS

Table1: Group A, non- diabetic burn, skin grafted patients n=30

Variables	Percentage (Mean $\pm$ SD)	Frequency (Mean $\pm$ SD)	P values
Percentage of burn	$7 \pm 1.3$	$2.5 \pm 1.6$	0.000
Diabetes levels mg/dl Random	$137 \pm 11.13$	$10 \pm 1.4$	0.000
Burn grade	$2 \pm 7.10$	$1 \pm 1.0$	0.000
Burn surface area	$9 \pm 10.31$	$4 \pm 2.1$	0.000
TBSA	$9.1 \pm 11.2$	$2 \pm 1.6$	0.000

0.005

The results of current study were considerable and reliable, total 42 diabetic and 30 non-diabetic burn patients were on treatment the age limit was 20 to 30 years and the selection criteria was low extremity burn area. Over time, the management of diabetic foot burns changed from aggressive surgery to a more conservative approach and outcomes of reflection of post-burn in diabetic people were healthy. The frequency percentage mean standard deviation of percentage of burn, random diabetes levels, burn grade, burn surface area and TBSA in Group A ( $2.5 \pm 1.6, 10 \pm 1.4, 1 \pm 1.0, 4 \pm 2.1, 2 \pm 1.6$ ) and Group B ( $4.1 \pm 2.4, 16 \pm 2.7, 1.6 \pm 1.5, 6 \pm 3.1, 4 \pm 1.8$ ) were calculated respectively. Similarly the rejection of skin grafts mean standard percentage deviation of diabetic and non-diabetic

patients were ( $32.12 \pm 11.12$ ), ( $15.10 \pm 12.15$ ). The results of this study were highly significant ( $<0.005$ ) and remarkable complicational changes were noted in parameters of diabetic than non-diabetic patients.

Table 2: Group B, Diabetic burn, skin grafted patients n=42

Variables	Percentage (Mean ± SD)	Frequency (Mean ± SD)	P values
Percentage of burn	11 ± 4.7	4.1 ± 2.4	0.000
Diabetes levels mg/dl Random	221 ± 12.16	16 ± 2.7	0.000
Burn grade	4 ± 3.5	1.6 ± 1.5	0.000
Burn surface area	12 ± 11.12	6 ± 3.1	0.000
TBSA	12.12 ± 14.12	4 ± 1.8	0.000

Table 3:

Variables	Rejection of skin grafts	Complications of skin graft surgery percentage (Mean ± SD)					P value
		Blood or	Infection	Discolored	Sensation pain	pus pooling	
	Percentage (Mean ± SD)					loss	
Diabetic Individuals	32.12 ± 11.12	12.1 ± 10	17.1 ± 10.3	32.15 ± 4.10	30.1 ± 1.10	18.1±4.8	0.000
Non-diabetic Individuals	15.10 ± 12.15	7.1 ± 11	7.5 ± 6.2	15.1 ± 10.2	8.5±7.8	9.4±5.3	0.000

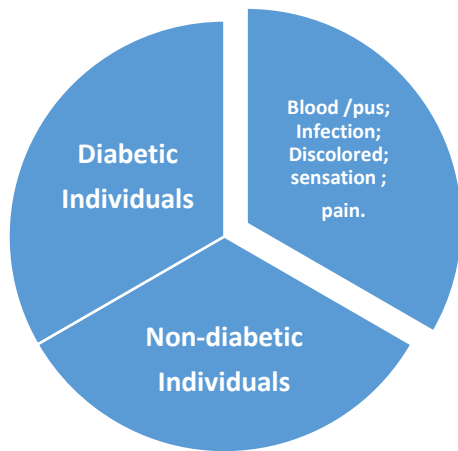


Fig 1: (Skin grafts complications)

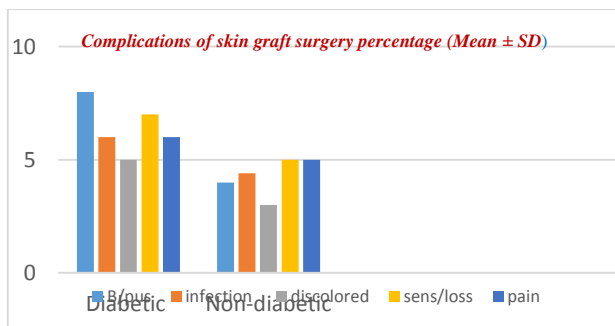


Fig 2:

**DISCUSSION**

Patients with diabetic foot burns can manage with number of options. Much time is required for conservative treatment of wound healing [7]. In surgical treatment there are so

much risks in diabetic individuals and amputations and regrafts were needed in these patients. Wound healing time may be longer than expected one [8]. The findings of different studies stated that correlation between healing of wound and age of diabetic patients are so variable than the non- diabetics. It has seen that in diabetic individuals increased age shown poor outcomes of different surgical treatments [8, 9].

Whereas it is also noticed that outcomes of other factors are also not so much healthy like length of stay in hospital, skin grafts and infections in diabetics patients as compared to non- diabetic [10]. The current study was a comparative cross- sectional study between diabetic and non-diabetic low extremity burn patients the results of this study were highly significant ( $<0.005$ ) and clear remarkable complicational changes were seen in both groups. The rejection of skin grafts mean standard percentage deviation of diabetic and non-diabetic patients were ( $32.12 \pm 11.12$ ), ( $15.10 \pm 12.15$ ). Total 42 diabetic and 30 non-diabetic hospitalized patients were on treatment their age limit was in between 20-30 years. The frequency percentage mean standard deviation of percentage of burn, random diabetes levels, burn grade, burn surface area and TBSA in Group A ( $2.5 \pm 1.6, 10 \pm 1.4, 1 \pm 1.0, 4 \pm 2.1, 2 \pm 1.6$ ) and Group B ( $4.1 \pm 2.4, 16 \pm 2.7, 1.6 \pm 1.5, 6 \pm 3.1, 4 \pm 1.8$ ) were calculated respectively.

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