

## STRESS INDUCED DIABETES IN BURNS PATIENTS

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**ABSTRACT:** Patients with severe burns typically experience a systemic response expressed as increased metabolism, inflammation, alteration of cardiac and immune function and associated hyperglycemia. Stress hyperglycemia is common in patients with hypertonic dehydration in conditions like burns and shock. In some people stress. Hyperglycemia may indicate a reduced insulin secretory capacity or a reduced sensitivity, and in sometimes the first clue to incipient diabetes. The present study is to reveal the number of burn patients who have developed stress hyperglycemia. Indicating the increased of infections complications in them.

**Key words:** Stress, diabetes, Burns patients

### INTRODUCTION

Burns are considered as one of the most severe forms of trauma (Demling RH, 1908) more than 5,00,000 burn patients occurs annually in the unites States, resulting in approximately 20,000 acute admissions to burn centers (American Burn Association) Indian population estimated annual burn incidents in India is approximately 6-7 million's per year (IJPS 2010 Sept 43). Severely burned patients typically experience a systemic response, including inflammation, increased metabolism, alteration of cardiac and immune function and hyperglycemia. (Jeschke MG, Chinkes DL 2008). Stress hyperglycemia is a medical term referring to transient elevation of the blood glucose due to the stress of illness. Plasma glucose levels more than 200 mg/dl in non diabetic patients occurring due to injury (Wahl WL, Taddori O, 2008). Hyperglycemia is an almost universal finding among patients suffering major burn injury burned patients exhibit increased gluconeogenesis and glycogenolysis as well as insulin resistance, leading to decreased glucose uptake and reduced clearance. Hyperglycemia in critically ill patients have high incidence of infections and sepsis. (MC Cowen KC, Malhotra A, 2001). They have significant risk of complications, especially wound infections, pneumonia and bacteremia, sepsis. However they also found a statistically greater frequency of fungemia in those patients deemed hyperglycemia.

### MATERIAL AND METHODS

The study was conducted over a period of 3years. The study includes fifty burns patients who have developed diabetes after admission in plastic surgery department in Narayana Medical College and Hospital. Blood samples were collected after 12 hours of fasting for estimation of FBS and blood is collected EDTA and heparin bottles for the estimation of HbA1c and PPBS sample was collected after two hours of ingestion of food and analysed. Glycated haemoglobin was estimated y cat ion exchange resin method (Trivelli, L.A). Glucose is estimated by glucose oxidase and peroxidase method Trinder P. 1969).

### RESULTS

The results were expressed as mean, standard deviation. (The p value was used to compare the patient mean value).

**Table 1: Shows the percentage of burns and the fasting blood sugar.**

No. of Patients	% of Burns	Mean FBS	Mean PPBS
20 patients	40-50% burns	210	280
20 patients	50 – 60% burns	230	320
10 patients	>60% burns	280	350

**Table 2: Shows the values of HbA1c, PPBS and FBS in patients.**

Parameters	Mean	S.D	P value
FBS	210	42	0.01
PPBS	260	43	0.01
HbA1c	7.6	0.53	0.05

## DISCUSSION

Stress induced hyperglycemia is a multifactorial condition and is a complex process in severely burned patients. In our present study there was elevation of blood glucose levels along with elevated HbA1c with increased percentage of burns which is highly significant (p value 0.01) which is associated with increased incidence of fungemia, bacterial infections and sepsis in hyperglycemic patients. These conditions themselves can produce or perpetuate hyperglycemia indicating that hyperglycemia may also be a marker of sepsis rather than a direct cause. The fact that diabetic patients have an increase incidence of infection and there is impairment of immune cells, immunoglobulins and inflammatory mediators invitro when exposed to high glucose level (Black CT, Hennessey PJ 1990). Supports the role of hyperglycemia in increasing the incidence of infection.

Furthermore, by treating hyperglycemia, infection rates are decreased resulting in a beneficial impact on mortality as infections and sepsis are major causes of death in severely burned patients (Gore DC, Chinkes 2001).

## REFERENCES

- American burn association / American College of Surgeons; Guidelines for the operation of burns centers. (2007). *J burn care Res* 28(1): 134-141,
- Black CT, Hennessey PJ, (1990). Short term hyperglycemia depresses immunity through non enzymatic glycosylation of circulating immunoglobulin. *Journal of Trauma* 30(7): 830 – 8 32, discussion 832-833.
- Demling RH: (2008). Burns what are the pharmacological treatment options. *Expertopin pharmacother* 9(11): 18905 – 908,
- Gore DC, (2001). Chinkes, associationl of hyperglycemia with increased mortality after severe burn injury *journal of Trauma* 51(3); 540-544,
- Indian Journal of Plastic Surgery (IJPS) 2010 sept ; 43.
- Jeschke MG, Chinkes DL, Finnerty CC (2008). Pathophysiologic response to severe burn injury. *Ann Surg* 248 (3): 387 – 401,
- MC Cowenkc, Malhotra. A, (2001). Stress induced hyperglycemia *crit careclin* 17(1): 107- 124,
- Takala J, Ruokonen E (1999). Increased mortality associated with growth hormone treatment in critically ill adults *N Engl J Med* 341(11): 785-792,
- Trivelli, LA glucose is estimatd by glucose oxidase and peroxidase method.
- Trinder P (1969). *Annals, clin Biochem* 6, 94.
- Wahl WL, Taddori O, (2008). Glucose values predict trauma patient's mortality, *J Trauma* 65(1): 42 -47, discussion 47-48.