



## Micro-Albuminuria As a Prognostic Marker in Burn- A Retrospective Study

### KEYWORDS

Microalbuminuria, creatinine, ACR, capillary permeability, burn

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**ABSTRACT** Background- Microalbuminuria, is said to be a reflection of increased capillary permeability associated with the systemic inflammatory response syndrome. It is a ratio between urinary albumin and creatinine. A study was made to find out correlation microalbuminuria and prognosis of burn patients.

Methods- Retrospective study was undertaken with adult of burn between burn 35-55% of total body surface area. Exclusion criteria were known diabetic, hypertensive, renal disease, pregnancy and paediatric patients (Electric and chemical burn) ACR was measured twice a week and the outcome studied was mortality.

Results- 43 patients were included in this study. 32 patients survived and were discharged from hospital and 16 patients succumbed to their injuries. Data were analysed. The ACR ratio remained stable in survivors whereas it peaked in 2nd and 5th week in non-survivors.

Conclusion- We conclude that ACR can be used as a useful marker for the survival of the burn patients.

### Introduction-

Microalbuminuria is defined as a urinary albumin concentration of 30–200 mg litre<sup>-1</sup>. It is generally expressed as ratio of the urinary albumin to creatinine (ACR). ACR is calculated from a spot urine test based on the assumption that the urinary creatinine excretion rate remains constant.<sup>1</sup> The normal value of ACR<sup>3</sup> is less

than 2.3 mg mmol<sup>-1</sup>, although a 3-fold increase above the upper normal limit be used as an index of severity of systemic responses.<sup>6</sup>

In patients with burn injuries, a marked increase in capillary permeability is seen from the onset of Burns which result in albumin permeability from the glomerulous kidney. This was initially thought to be occurring in renal disease of diabetic. Now it has been observed to be predictive to many groups of critically ill patients.

### Methods-

A retrospective study of 48 patients with extensive burns admitted in emergency department of JLNMCH, Bhagalpur, Bihar over a period of 1 year from Jan 2012- Jan 2013 was done. The Exclusion criteria were paediatric patients with burn <35% and >55% of total body surface area, patients with chemical and electrical burn and known diabetic, renal disease, hypertension, pregnant ladies.

The parameters recorded were age, sex and % of burn. ACR was recorded twice a week. The outcome of the study was mortality. Fresh early morning sample of urine was collected from patients. ACR was measured using the DCA 2000 Analyser with desktop. The principle of measurement of microalbumin is based on immunoturbidimetry, and that of creatinine based on colorimetry and ratio is then calculated and results is expressed in mg mmol<sup>-1</sup>. The data was analysed using standard statistical methods and the p value was found to be under 0.05.

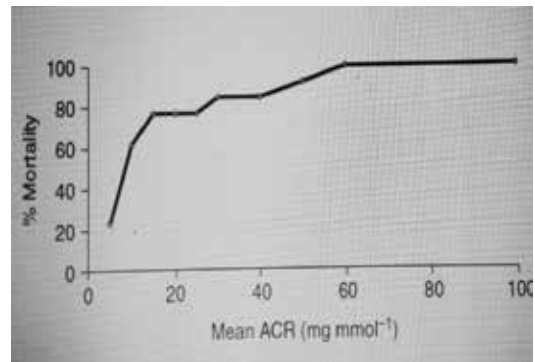
### Group Survivor Non-survivor

Number 32 16

Age group 18-48yr 25-70yr

Gender (M:F) 6:26 2:14

Figure- Relationship of mean ACR with mortality



### Results-

48 patients were included in this study. There were 32 survivors and 16 mortalities. There was no significant difference in patient characteristic data except that there is a large variation of mean ACR over time in both survivors and non-survivors. There is a biphasic peak in the non-survivors group. There was elevation in 2<sup>nd</sup> and 5<sup>th</sup> week in non-survivors. However, in the survivor group, there was no obvious identifiable peak in ACR.

Our data suggest that ACR values of between 15 and 20 mg mmol<sup>-1</sup> have mortality of 60%. There was a difference in maximum ACR between survivors and non-survivors, with a P-value of 0.002. There was no difference in ACR on admission of the two groups.

### Discussion-

In this study, we found that mean ACR of 20 mg mmol<sup>-1</sup> or more was associated with poorer outcome

in patients with extensive burns. There was also a biphasic variation of mean ACR in patients who died, with

either an early peak in the first week or after a month. Lastly, the maximum ACR measured was comparatively higher in patients who died as compared with those who survived. No differences found in ACR done on admission. There we conclude that in patients with extensive burn ACR is useful predictor of mortality and that ACR of >20mg/mmol is associated with poorer prognosis.

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