Abstract:

Intoduction: Cortisol is necessary to survive critical illness. But, absolute adrenal insufficiency is rare among critically ill patients. However, many observations argue that suboptimal cortisol production may be common and associated with worse outcomes. Suboptimal cortisol production during septic shock has been termed "functional" or "relative" adrenal insufficiency. In the 1990s, interest in corticosteroids as a therapy in septic shock was renewed, this time using smaller, more physiological doses for longer duration. Aim of this study was to assess the effect of low dose hydrocortisone on vasopressor weaning and lactate clearance in patients with refractory septic shock and to evaluate the diagnostic and prognostic value of free cortisol in septic patients.

Methods: Over the period from June 2010 to March 2012 forty Patients (23 males & 17 females) were admitted to Critical Care Department, Cairo University, meeting the criteria for sepsis and refractory septic shock, were included in our study. Patients were divided into a control group; that included 21 patients who were subjected to conventional treatment of septic shock (fluids, antibiotics and vassopressors) and a study group; that included 19 patients who received same conventional treatment plus intravenous Hydrocortisone (50 mg every 6 hours).Follow up of : ***Arterial Blood Pressure, lactate clearance, the dosage of Norepinephrine used and mortality*** were followed in the two groups during the course of treatment at days 0, 3 and 7.Random free cortisol was assessed in all patients before starting hydrocortisone and was correlated with morbidity and mortality.

Results: There was no statistically significant difference at day 0 regarding inflammatory variables between both groups *apart from* a significant difference in the respiratory rate *(P= 0.023)* while at day3, there was no statistically difference between both groups and at day 7, there was a statistically significant difference between both groups regarding *systolic BP (0.043), diastolic BP (0.035) and Glasgow Coma Scale score (0.020).* Initial manifestations of organ dysfunction at day 0 were worse in steroid group than in control group and there was no statistically significant difference between both groups at day 0 or day 3 while at day 7, a statistically significant difference between both groups regarding *INR , Platelets, Hb, AST and serum lactate* and *the steroid group showed worse manifestations* than in control group. Follow up of the changes in organ dysfunction in Control group showed a statistically significant difference regarding *urine output, serum creatinine, INR and serum lactate while only lactate clearance was of significant value in the study group.* Lactate clearance was statistically significant in both study & control groups (*P= 0.016, 0.001*) respectively, but the improvement was more in the control group. Vasopressor weaning showed a statistically significant difference between study &control groups *(P= 0.007, 0.0001)*. Free Cortisol level had a statistically significant positive relation with *S.Creatinine, ALT, SOFA score* and *Norepinephrine dose* and the level of free cortisol was higher in ventilated patients (*P=0.001)* and also in non-survivors *(P=0.0001).* There was no statistically significant difference between both groups regarding SOFA scoring. Roc curve analysis showed that Free Cortisol (FC) is considered *a highly reliable prognostic marker* in septic shock patients with an area under the curve *(AUC) = 0.99 and (p=0.003)* and the best cut off value for free Cortisol level was 33 mic/dl with sensitivity of 99% and specificity of 97%.Also there was no statistically significant difference between both groups regarding mortality.

Conclusion: From our study we concluded that Low dose of Hydrocortisone (200 mg per day) could be used in patients with refractory septic shock (no response to conventional treatment).

Key words: *Refractory septic shock, serum Lactate, hydrocortisone, free cortisol.*