Low dose steroids in early severe acute respiratory distress syndrome

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Abstract

Introduction: Acute respiratory distress syndrome places a significant burden on the health-care system, with an estimated prevalence of 7% of ICU admissions and an unacceptable hospital mortality rate of 50%. Pulmonary and systemic inflammation are the pathophysiologic hallmarks of this syndrome, and activation of the glucocorticoid receptor in pulmonary and circulating cells is an essential step in restoring homeostasis. While changing the ventilator settings to low tidal volume reduces systemic inflammation with a favorable impact on survival, a concomitant anti-inflammatory pharmacologic intervention should lead to a more rapid resolution of ARDS and earlier extubation. **Methods:** Our study was conducted on thirty patients admitted in the Critical Care Department, Cairo University Hospital with proven diagnosis of **Early Severe ARDS.** The studied population was divided into two groups: ***Group I***: Twenty patients were subjected to methylprednisolone treatment protocol plus conventional management for ARDS and ***Group II***: Ten patients were kept on conventional management for ARDS. All the studied population were subjected to full history taking, detailed clinical examination, full laboratory investigations, pan-cultures, APACHE II scoring system, MODS score on days(1 and 7),LIS on days (1,2,3,5and 7) ,serial chest radiographs ,invasive arterial line insertion, pulmonary artery catheter insertion, serial measurements of CRP on days (1,3,5 and 7) ,testing of adrenal function, lung protective strategy protocol and evaluation of the outcome as regards 1-point reduction in LIS or successful extubation ,duration of MV, length of ICU stay and ICU mortality.

Results: In our study , there were significantly lower values of ***MODS score*** on day (7) in group I compared to group II patients (1.8±1.1 vs 2.7±0.9 respectively, P value: 0.022),also we found that there was statistically significant decline in ***LIS*** in day (7) in group I compared to group II patients (1.925+0.815 vs 2.85+0.5676 respectively ,P value: 0.003) and a significant lower ***CRP*** values on day 7 in group I compared to group II patients was found (8.35+7.741mg/dL vs22.1 +16.394 mg /dL, p value:0.004) respectively. By day 7: The response of the two groups clearly diverged; the methylprednisolone-treated group had a statistically significant difference as regards ***a)1-point reduction in LIS*** (70% of patients in group I vs 20% of patients in group II , P value: 0.028) and ***b) successfully extubation***(11 patients in group I vs 1 patient in group II,P value: 0.048), moreover the treated patients had a statistically significant decrease in ***number of days of MV*** of (11.15 + 7.08 in group I vs 20.9+9.08 in group II respectively, P value 0.004). Our study did not demonstrate any significant difference in the incidence of ***new infection, neuromuscular weakness, uncontrolled hyperglycemia and GIT bleeding complications*** between the treatment and control groups,(p values: 0.7945,0.954 , 0.446 and 0.954) respectively. Also no significant difference in the ***length of ICU stay*** and ***ICU survival*** between group I and group II patients was found (P value: 0.846 and 0.06) respectively.

Conclusions*:* The use of low-dose corticosteroids provides evidence of efficacy in ***EARLY SEVERE ARDS*** (accelerated resolution of systemic and pulmonary manifestations of ARDS with significant reduction in duration of mechanical ventilation) with less adverse effect.

Key words: *ARDS; duration of mechanical ventilation; glucocorticoid treatment; infections; systemic inflammation*

Abbreviations: *APACHE _ acute physiology and chronic health evaluation; Fio2 _ fraction of inspired oxygen; LIS _ lung injury score; MODS _ multiple organ dysfunction syndrome; PEEP _ positive end-expiratory pressure4*