ABSTRACT

The concept of early goal-directed therapy in sepsis syndrome
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Abstract: ***Background:-*** Early goal-directed therapy (EGDT) provided a consensus-derived protocol to reverse the hemodynamic disturbances by adjustment of cardiac preload, afterload, and contractility to balance oxygen delivery with oxygen demand after early identification of patients with severe sepsis and septic shock. ***Objective:-*** To evaluate the concept of EGDT; provided at the earliest stages of severe sepsis and septic shock; regarding the clinical course and final outcome. ***Methods:-*** A prospective, randomized, single center study were conducted on 30 patients admitted with severe sepsis and septic shock, and treated according to the protocol of EGDT which consists of aggressive hemodynamic support during the first 6 hours after sepsis is recognized, to achieve certain physiologic targets. Another 30 age matched patients served as control group received only conventional sepsis treatment. Both groups were matched by APACHE IV score (within the 1st 6 hours). MODS and SOFA scores were calculated at baseline and everyday until ICU discharge or death. ***Results:-*** EGDT; provided at earliest stage of severe sepsis or septic shock; has: (1) significant improvement of patient outcome as indicated by significant reduction of SOFA and MODS scores from the second day of hospital stay (P values = 0.006 for SOFA and 0.03 for MODS), (2) significant reduction of ICU stay for surviving patients (P value = 0.02), (3) significant reduction of the 28 days mortality (40% vs 73.3% with P value = 0.009), (4) non significant reduction of the need for organ supportive measures (P values = 0.24 for the need for mechanical ventilation and 0.67 for acute hemodialysis). ***Conclusion:-*** EGDT provide significant benefits with respect to outcome in patients with severe sepsis and septic shock.

Key words:- *EGDT, sepsis, APACHE IV, MODS, SOFA.*

<u>Background</u>*:- **Early goal-directed therapy used in the treatment of severe sepsis and septic shock is essentially a comprehensive strategy that involves the early identification of high-risk septic patients and performance of a consensus-derived protocol to reverse the hemodynamic perturbations of hypovolemia, vasoregulation, myocardial suppression, and increased metabolic load by adjustment of cardiac preload, afterload, and contractility to balance oxygen delivery with oxygen demand.***

<u>Purpose</u>:- To evaluate the concept of Early Goal Directed Therapy; provided at the earliest stages of severe sepsis and septic shock; regarding the clinical course and final outcome.

<u>Methods</u>:- A total of 30 critically ill septic patients admitted to the kasr Al-Aini hospital, Cairo university, were included in a prospective, randomized, single center study. They were subjected to central venous catheter insertion and treated according to the protocol of EGDT as soon as possible which consists of aggressive hemodynamic support during the first 6 hours after sepsis is recognized, that is aimed at achieving specific physiologic targets including: central venous pressure (CVP) 8 to 12 mm Hg, mean arterial pressure (MAP) greater than 65 mm Hg, urine output (UO) greater than 0.5 mL/kg/hr, and central venous oxygen saturation ($ScvO_2$; from superior vena cava) greater than 70%. The goal for CVP in patients who are mechanically ventilated or who have increased abdominal pressure is between 12 and 15 mm Hg. Another 30 age matched patients served as control group received only conventional sepsis treatment. APACHE IV score was calculated once (during the initial 6 hours of admission) and SOFA score was calculated at baseline and subsequently thereafter everyday until ICU discharge or death. Clinical outcome (duration of stay in the ICU, need for mechanical ventilation, need for inotropic/vasopressor support, need for haemodialysis, and final outcome of survival/mortality rates) were recorded for all patients.

<u>Results</u>:- There were no significant differences between the two groups with respect to base-line characteristics. The in hospital mortality was significantly lower in those subjected to EGDT as compared with control group (40% vs 86.6% with P value=0.009). For surviving patients, there was a significantly lower ICU stay in EGDT group (8.2 ± 3.1 vs 39 ± 43d with P value = 0.02). APACHE IV, initial SOFA and initial MODS showed non significant difference between the two groups. (P value = 0.778, 0.37 and 0.277 respectively). In the following days of hospital course, there was significant improvement starting from the second day in the EGDT group, as indicated by SOFA (mean$^{1st\ day}$ 9.5 ± 3.02 vs mean$^{2nd\ day}$ 7.8 ± 3.66 with P value= 0.006) and MODS scores (mean$^{1st\ day}$ 7.93 ± 1.75 vs mean$^{2nd\ day}$ 6.86 ± 2.44 with P value= 0.03). Moreover, SOFA and MODS scores significantly improved in the first five days of ICU stay reaching the peak in the 5th day as regard SOFA score (P value = 0.01), and 4th day as regard MODS score (P value = 0.009) . On the other hand, there was no significant difference in control group through out the hospital stay. In relation to the control group, the EGDT group exhibited non significantly lower frequency of those needed vasopressor support (18 "60%" vs 26 "86.7%" with P = 0.1) and those needed MV (18 "60%" vs 24 "80%" with P = 0.24). Also, EGDT group exhibited non significantly higher frequency of those needed acute HD (8 "26.7%" vs 6 "20%" with P = 0.67), those needed readmission (4 "13.3%" vs 0 with P value = 0.15), and those needed emergency surgery as a part of radical therapy of sepsis (12 "40%" vs 0 with P value = 0.007).

<u>Conclusion</u>:- Early goal-directed therapy provide significant benefits with respect to outcome in patients with severe sepsis and septic shock.

<u>Key words</u>:- early goal directed therapy, sepsis, mortality, scoring systems.