The Prognostic Value of Soluble Intercellular Adhesion Molecule 1 Plasma Level in Children With Acute Lung Injury.

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Abstract
Objective: The objective of this study was to evaluate the prognostic significance of soluble intercellular adhesion molecule 1 (sICAM-1) measurement in plasma for the prediction of outcome of acute lung injury (ALI) in children that may allow early recognition of critical cases.
Methods: The study was performed as a prospective, controlled cohort study involving 40 children with ALI and 30 healthy children. The plasma level of sICAM-1 was measured at days 1 and 3 of development of ALI for the patient group and measured only once for the control group. C-Reactive protein was measured in both groups on day 1 only.
Results: There was significant increase in sICAM-1 in the patient group than in the control group (P ¼ .001*). The mortality rate reached 55% in children with ALI. The ceased group had significantly higher plasma sICAM-1 levels both at days 1 and 3 than the survived group (P < .001*), and there was positive correlation between plasma sICAM-1 level and both duration of mechanical ventilation and the death rate, but more significant correlation was observed with plasma sICAM-1 levels at day 3 than day 1. **Conclusion:** Plasma sICAM-1 level served as a good predictor biomarker for both mechanical ventilation duration and the mortality risk in children with ALI.

Beneficial Effects of Omega-3 Supplement to the Enteral Feeding in Children With Mild to Moderate Sepsis

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Abstract

Objective: The objective was to investigate the benefits of supplementing enteral feeding with omega-3 fatty acids in children with mild to moderate sepsis and its effects on acute-phase reactants and interleukin 6 (IL-6) level. **Methods**: The study was a prospective randomized, double-blind, placebo-controlled study from January 2012 to June 2014, which included 2 groups of children with mild to moderate sepsis tolerating enteral feeding. Group A included 60 children supplemented with omega-3 fatty acids, whereas group B included 60 children who received enteral feeding without omega-3 supplementation. Both groups had complete blood pictures, C-reactive protein (CRP), erythrocyte sedimentation rate (ESR), serum albumin, and IL-6 before and after 7 days from supplementation. **Results**: There was a significant improvement in hemoglobin percentage ($P < .0001$), total white blood cell (WBC) count ($P < .0001$), and platelet count ($P < .0001$) and significant decrease in CRP ($P < .0001$), ESR ($P < .0001$), IL-6 ($P < .0001$), and albumin level ($P < .001$) in the supplemented group than the nonsupplemented group. The supplemented group also had a significantly shorter duration of stay in pediatric intensive care unit (PICU; $P < .01$) and decreased death rate than the nonsupplemented group. **Conclusion**: Children with mild to moderate sepsis showed significant improvement in inflammatory markers and had shorter PICU admission when enteral feeding was supplemented with omega-3 essential fatty acids.

The Predictive Value of Von Willebrand Factor Antigen Plasma Levels in Children With Acute Lung Injury

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Summary. Objective: Von Willebrand factor antigen (VWF-Ag) is proved to be a marker for pulmonary endothelial injury in acute lung injury (ALI).We aimed to evaluate the predictive value of VWF-Ag plasma levels in children with ALI. **Methods**: Prospective controlled study included 40 children with ALI as a patient group, 40 healthy children as a control group. Plasma VWFAg level was measured at days 1 and 3 in patient group and measured once for control group. Results: The commonest cause of ALI was pneumonia (35%). VWFAg plasma levels were significantly higher in patient group than control group at days 1 and 3 (P=0.001 and 0.002), respectively. Mean PaO2/FiO2 of patients with ALI was 137±65.38. Mortality was 30%. The deceased subgroup had significantly higher plasma levels of VWFAg at days 1 and 3 than survived subgroup (P=0.016 and P<0.0001, respectively), significantly higher C reactive protein (P=0.001), significantly higher rate of multisystem organ failure (MSOF) (P=0.001), shorter duration of pediatric intensive care unit (PICU), and mechanical ventilation (MV) free days (P<0.0001). Elevated VWF at day 1 was associated with significant MSOF (P=0.011) and mortality (P=0.009), while elevated VWF Ag at day 3 was associated with significant increase in MSOF (P=0.004), length of MV (P=0.024), and PICU stay (P=0.011). VWF Ag has a high sensitivity (94.2%, 93.4%) and specificity (83.1%, 81.7%) for prediction of mortality at days 1 and 3, respectively. Multivariate regression analysis revealed that plasma VWFAg level is an independent predictor of mortality in ARDS pediatric patients. **Conclusion**: Plasma VWFAg level is an excellent predictive marker for outcome in children with ALI/ARDS.

Oxidative Stress and Cardiac Dysfunction in Children with Chronic Renal Failure on Regular Hemodialysis

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Abstract
Objective The objective of this study was to evaluate cardiac function in children with end-stage renal disease (ESRD) on regular hemodialysis using speckle tracking echocardiography (STE) and correlate results with plasma glutathione level as a marker of oxidative stress. **Methods** The study involved 30 children with ESRD and 30 healthy controls. The plasma glutathione and C-reactive protein (CRP) levels were measured, and cardiac function was evaluated using conventional echocardiography and STE. **Results** Plasma glutathione levels were significantly lower and CRP significantly higher in patients than in controls. Children with ESRD had significant systolic and diastolic cardiac dysfunctions detected by STE compared with controls. Conventional echocardiography failed to detect these dysfunctions. There was significant increase in left ventricular relative wall thickness (LV-RWT) in patients, especially those with hypertension, compared with the control group. There was also significant impairment of LV and right ventricular (RV) global longitudinal strain (GLS) and torsion; however, LV-GLS was significantly better in hypertensive than in normotensive patients. The degree of impairment in GLS and cardiac torsion negatively correlated with plasma glutathione levels. **Conclusion** Significant oxidative stress was present in children with ESRD and was correlated with the degree of cardiac dysfunction detected early using the new cardiac imaging modality, STE.

The Predictive Value of Soluble Endothelial Selectin Plasma Levels in Children with Acute Lung Injury

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Abstract

The study aimed to evaluate the value of soluble endothelial selectin (sE-selectin) plasma level measurement in predicting acute lung injury (ALI) outcome in children. **Methods:** The study was a prospective, controlled study that involved 50 children with ALI and 50 healthy children as a control. Soluble endothelial selectin and C-reactive protein plasma levels were measured at days 1and 7 of development of ALI for the patient group and done only once for the control group. **Results:** Plasma sE-selectin was significantly higher in the patients than the control group (P = .001). Mortality reached 32% of children with ALI. The deceased subgroup had significantly higher plasma sE-selectin levels both at days 1 and 7 than the survived (P=.02 and P < .001 respectively). There was positive correlation between plasma sE-selectin at day 7 with durations of both pediatric intensive care unit and mechanical ventilation. Levels of sE-selectin at days 1 and 7 had significant positive correlation with C-reactive protein level and ALI severity. Soluble endothelial selectin plasma levels of 302 ng/mL at day 7 were the best cutoff value to predict ALI related deaths. **Conclusion**: Plasma sE-selectin level served as a good predictor biomarker for both mechanical ventilation duration and the mortality risk in children with ALI.

Serum Soluble Endothelial Selectin Levels in Critically Ill Pediatric Septic Patients

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Abstract

Background: Sepsis is the most common cause of death in infants and children worldwide. Severe infection and sepsis are among one of the most devastating problems of patients who are critically ill, as these conditions are characterized, at least in part, by altered leukocyte endothelial interaction. Different studies demonstrated that sE-selectin was being elevated in septic patients and were highly correlated with hemodynamic compromise in adult ICU patients. Therefore, elevated sE-selectin levels were suggested to be linked to microbiologically documented sepsis**.**

Aim: To evaluate the relation between serum sE-selectin levels and outcome of sepsis in pediatric intensive care unit patients.

Methods: This study was carried out on 80 infants and children with different grades of sepsis (patient group) including: 45 cases with sepsis, 25 cases with severe sepsis and 10 cases with septic shock. Another 40 critically ill non septic infants and children (with diagnoses other than sepsis) who were age and sex matched with the septic group, were enrolled as control group. All patients were chosen consecutively and randomly from the PICU of Pediatric Department at Tanta University Hospital. All studied patients were subjected to complete history taking, clinical examination and routine sepsis workup. Serum concentrations of sE-selectin were determined using ELISA technique. Patients were assessed using the Sequential Organ Failure Assessment (SOFA) scoring and Pediatric Risk of Mortality III-24 (PRISM III-24) score.

Results: Serum soluble E-selectin level (obtained within 24 h of ICU admission) showed a mean of 227.32 ± 33.03 ng/ml in the patients group with sepsis compared to 86.6 ± 17.82 ng/ml in the control group. The difference was statistically highly significant (P value < 0.001). However, the difference was statistically insignificant between patients (sepsis, severe sepsis, septic shock) subgroups (P value > 0.05 for all). Serum soluble E-selectin levels were higher in non survivors compared to survivors but without being statistically significant (P value > 0.05).

Conclusion: Serum sE-selectinlevel in first 24 hour of admission can be used as a rapid and reliable marker for early diagnosis of pediatric sepsis but not to be used an indicator of sepsis severity or predictor of mortality in pediatric sepsis.

Receptor for Advanced Glycation End Products in Pediatric Sepsis: A pilot study

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Abstract

BACKGROUND: Sepsis in pediatric patients still a leading cause of morbidity and mortality. **AIM:** To determine whether serum level of receptor for advanced glycation end products (RAGE) could be used as a potential diagnostic and prognostic marker in septic child. **METHODS:** A pilot study on pediatric intensive care unit patients over a 1year period with clinical evidence of sepsis. Forty patients were enrolled in the study within the first 24 h after onset of sepsis; they were classified according to 28 day mortality into survivors and non-survivors. CBC,ESR, CRP and sRAGE were measured . Bacterial cultures from suitable body fluids in septic patients were carried out. **RESULTS:** There were significant increased mean serum sRAGE level among septic patients than controls (***P=0.001***) and non-survivors than survivors (***P=0.001***). A cutoff value of serum sRAGE 1325 pg /ml showed sensitivity 89.2% and a specificity 78.3%.There were positive correlations with CRP , PRISM III and no correlation with bacterial culture. Multivariate logistic regression analysis showed that sRAGE level and leucocytes count were significant marker in sepsis diagnosis(***P***=0.047 [*], 0.001[*]) respectively. sRAGE level and a PRISM III score were significant parameters in sepsis prognosis (***P***=0.019*, 0.043 *) respectively. **CONCLUSION:** Serum sRAGE could be used to prove diagnosis and as a prognostic marker for pediatric sepsis, especially those with negative culture.

Performance of Pediatric Index of Mortality-2 Scoring System in Tanta University Pediatric Intensive Care Unit

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Abstract

Objectives:
A study to validate Pediatric Index of Mortality-2 (PIM2) and evaluate quality of care in Tanta University pediatric intensive care unit (PICU).

Methods:
This is a prospective cohort study performed in Tanta University Hospital. We studied the patients admitted to the PICU from January 2014 to December 2014. PIM2 scoring system was assessed within an hour of infant or child's arrival to the PICU. Logistic regression analysis was done to compare expected mortality risk with observed mortality rate. Receiver operating characteristics (ROC) curve analysis was done and standardized mortality ratio was calculated. PIM2 Index validation was performed by use of Hosmer and Lemeshow goodness-of-fit test.

Results :
Two hundred patients were included in this study. The model fit was achieved adequately (*P* value=0.741). The area under the ROC curve was 0.773 (95%CI: 0.65- 0.92) and standardized mortality ratio was 1.08.PIM2 calibrated well using Hosmer Lemeshow analysis (X2=5.58 ,*P*=0.34). The expected deaths were 34% and the observed deaths were 37%. The expected /observed ratio is 0.91

Conclusion: PIM2 can be used as a good prediction model for pediatric mortality and as a tool for assessing the overall quality of care in Tanta University PICU. It shows adequate discriminatory function and well calibrated for the case mix of patients in PICU of Tanta, Egypt.