

Abstract

Introduction: Sepsis is one of the most important causes of death in ICU, Acute kidney injury is one of MODS that occur in sepsis. Sepsis can alter RBCS morphology & rheology (viscosity, aggregation and deformability) which cause hemolysis.

Aim of the study :Evaluate haptoglobin, free hemoglobin and NGAL in estimation of morbidity, mortality and AKI in sepsis; sever sepsis and septic shock patients with normal kidney function on admissionwith APACHE II score and SOFA score.

Methodology:We included 44 patient admitted to ICU with sepsis and septic shock with normal kidney function on admission,(Full laboratories), (blood, urine, sputum and drains c/s) (blood sample for haptoglobin, NGAL and free hemoglobin).

Results: Haptoglobin day1 statistically correlated with GCS (R: 0.341, P: 0.024), NGAL day 1, APACHE II and SOFA day1 (R: -0.623, -0.679, -0.745, P < 0.001, < 0.001, < 0.001) respectively.

Free hemoglobin day1 statistically correlated with GCS (R: - 0.0455, p: 0.002), NGAL day1, APACHE II, SOFA day1and haptoglobin day 1 (R: 0.571, 0.556, 0.693,-0.668 P:< 0.001, < 0.001, 0.001, <0.001) respectively.

NGAL values on day 1 statistically correlated to GCS (R: - 0.402 P: 0.007) APACHE II, SOFA on admission and SOFA on day 1 (R: 0.717, 0.749, 0.756) (P :< 0.001, < 0.001, < 0.001) respectively.

Mortality was statistically significant correlated to Haptoglobin (P:< 0.001) (R: -0.0762), free hemoglobin (P < 0.001 R: 0.780) and NGAL (P :< 0.001)(R:0.768).

NGAL had AUC of 69.9% with sensitivity of 72.4% and specificity of 60.0% for cut-off of 117 ng/ml at day 1 to predict AKI.

Conclusion:

- Sepsis induced hemolysis could be a cause for many sepsis related complications.
- The occurrence and severity of hemolysis could be the cause of kidney injury in septic patients.
- Haptoglobin and plasma free hemoglobin l& NGAL levels could be used as a predictors for mortality in septic patients.
- NGAL is continuing to prove efficacy in predicting the occurrence of kidney injury and it's severity especially in septic patients with proved hemolysis.
- In prediction of 30 day hospital mortality free hemoglobin showed 96.8% AUC with sensitivity 78.5% & specificity 98.3% while haptoglobin showed 35% AUC with sensitivity 8.3% & specificity 10.7% and NGAL showed 93.4% AUC with sensitivity 87.5% & Specificity 89.3%.

Key Words : Red Cell Hemolysis - Acute Kidney Injury .