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Early predictors of injury severity in blunt trauma.

BACKGROUND

Identifying life threatening injuries in blunt trauma patients is a task of paramount importance that requires diligence and expedience. In that context, markers associated with injury severity can be a useful tool in the armamentarium of the clinician that directs his/her attention to the possibility of a missed injury, one that might prove fatal if left undiagnosed and untreated.

AIM

To investigate the usefulness of white blood cell (WBC) count, Mean Arterial Pressure (MAP) and Heart Rate (HR) as early markers of injury severity.

METHODS

We retrospectively reviewed blunt trauma patients arriving to the emergency department (ED) within 30 minutes of their injury. Patients that presented without vital signs or those with a known history of hematologic or cardiac disorders were excluded. WBC counts obtained upon their arrival to the emergency department were documented and the injury severity score (ISS) was calculated independently by two surgeons. We examined the correlation of WBC count, age, MAP and HR with the degree of injury using the ISS. Stepwise multiple regression analysis was used to identify independent predictors of ISS. Patients were stratified in two groups according to injury severity ($ISS < 16$ and $ISS \geq 16$) and a Receiver Operator Curve (ROC) was utilized to evaluate the predictive capacity of WBC count.

RESULTS

Overall, 67 patients were included (mean age 40.1 ± 18 years old, 59% male). A direct significant correlation of WBC count ($p=0.024$) and HR ($p=0.02$) to ISS was found with a coefficient of determination $R^2=0.197$. The predictive formula derived from multiple regression analysis is as follows: $ISS = -3.661 + 0.001 \times WBC + 0.15 \times PR$. The predictive capacity of WBC was evaluated using a ROC (Area Under Curve, $AUC=0.659$, $p=0.028$).

DISCUSSION

Findings of the present study suggest that HR and WBC count are significantly correlated to the extent of injury, in patients having suffered blunt abdominal trauma. Furthermore, WBC count can distinguish between moderate ($ISS < 16$) and severe ($ISS \geq 16$) trauma and although its predictive power is modest, it may serve as a cheap and quick adjunct that alerts physicians to the possibility of severe occult injury.