

Determination of the immune status following trauma

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Trauma patients often succumb to bacterial infections that are regularly cleared by healthy individuals. Following trauma, patients develop what is commonly called systemic inflammatory response syndrome (SIRS). The degree of SIRS can be attributed to the severity of the trauma as well as the age and genetic make-up of the individual. One consequence of SIRS is an alteration of the number and type of circulating leukocytes. Subsequent to the SIRS, there is an anti-inflammatory response whose purpose is to attenuate and terminate the pro-inflammatory activities. Current research is focused on methodologies to modulate inflammation. Presently, a gap exists in our knowledge on how to determine the immune status of the patient. We hypothesized that enumeration of white blood cell subsets and T cell function would determine the immune status of blunt trauma patients in the ICU. Further, we hypothesized that this determination can be predictive of adverse clinical outcomes. Leukocytes were phenotyped and function analyzed after obtaining consent. We observed that trauma patients had significantly increased neutrophils and monocytes as compared to healthy controls. Naïve CD4 and CD8 T cells were decreased. In addition, naïve T cells showed dysfunctional signaling. Finally, mitogen activated T cells produced less IFN gamma as compared to controls. In conclusion, insufficient patient numbers prevented us from obtaining clinical correlations of adverse outcomes with T cell immunosuppression. Altogether, these data illustrate T cell immunosuppression after trauma is associated with decreased T cell numbers as well as dysfunctional TCR mediated signaling and represents new methodology for determining immune status.