

Humanitarian Scholar – Kenya

**Post-Traumatic Inflammatory Load: Interleukin-6 and -8 Levels, Associated Potential Surrogate Markers, and Regression Analysis for Impact of Various Injury Properties**

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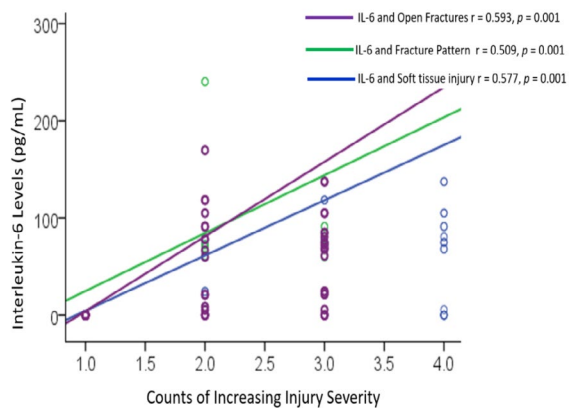
**Purpose:** The study sought to evaluate the levels of interleukin (IL)-6 and IL-8 following various fractures; to explore correlations between inflammatory cytokines, vital signs, complete blood count parameters, and injury severity following various fractures; and to perform regression analysis for the impact of various injury properties on the posttraumatic inflammatory load.

**Methods:** This controlled analytic study was conducted at a tertiary referral facility. A total of 70 adult participants comprised of 56 patients with fractures and 14 age- and gender-matched controls were studied. Fractures were evaluated for bone involved, number, pattern, extent of soft-tissue involvement, and whether they were open or closed. Flow-cytometry bead assay was used to analyze IL-6 and IL-8. One-way analysis of variance was used to compare the means. Pearson and Spearman rank correlation tests were used to check for association between IL-6 and IL-8 versus vital signs, complete blood count parameters, and fracture properties. A multiple linear regression model was used to determine whether fracture properties could predict the level of inflammation.

**Results:** The fracture groups had higher mean IL-6 and IL-8 levels ( $P < 0.01$ ). The polytrauma patients had statistically significant higher pulse rate, respiratory rate, and shock index than the negative controls ( $P < 0.01$ ). There was positive correlation between IL-6 and both shock index ( $r = 0.312, P < 0.05$ ). In addition, there was inverse correlation between IL-6 and platelet count ( $r = -0.252, P = 0.05$ ). Soft-tissue involvement ( $\beta = 0.646, P = 0.004$ ) and fracture pattern ( $\beta = -0.497, P = 0.04$ ) significantly predicted the level of inflammation.

**Conclusion:** The IL-6 and IL-8 levels are elevated following various fractures, being highest in the polytrauma patients. The level of inflammation is inversely correlated with platelet count and positively correlated with shock index, offering potential surrogate markers. Extent of soft-tissue injury and fracture pattern are significant predictors of the level of inflammation.

**An Overlay Scatter Plot of Interleukin-6 versus Severity of Fracture Pattern, Soft Tissue Injury and Open Fractures**



The FDA has stated that it is the responsibility of the physician to determine the FDA clearance status of each drug or medical device he or she wishes to use in clinical practice.