# Predicting Septic Patient Outcomes Based on Serum Cytokines

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## Abstract

**Background:** Cytokine storms significantly influence systemic inflammatory responses and septic patient outcome, highlighting the critical role of cytokine profiling in understanding and predicting patient's outcome [1], which holds significant potential for future clinical and therapeutic applications. The present work aims to evaluate how serum cytokines can predict the outcome of septic patients at intensive care units (ICU). **Methods:** Serum samples from 16 septic patients (7 discharged, 9 deceased) were analyzed using a Milliplex 384-Well High Sensitivity Human T Cell Magnetic Bead Panel to profile a comprehensive set of 21 cytokines: ITAC, GM-CSF, Fractalkine, IFN-g, IL-10, MIP-3a, IL-12p70, IL-13, IL-17a, IL-1b, IL-2, IL-21, IL-4, IL-23, IL-5, IL-6, IL-7, IL-8, MIP-1a, MIP-1b, and TNF-a. Machine learning tools coupled to a Gini decrease ranking method were employed to identify cytokines critical for discriminating between deceased and discharged patients. **Results:** Preliminary findings indicate that IL-6, MIP-3a, IL-8, IL-12p70, and IL-10 are notably linked to sepsis outcomes. The relevance of these cytokines aligns with existing literature on their roles in inflammation and immune responses [2]. Predictive models constructed using the Naive Bayes models showed promising results, with sensitivity and specificity exceeding 86%. **Conclusion:** This study underscores the importance of cytokine profiling in sepsis, highlighting key biomarkers for predicting patient outcomes.

**Keywords:** sepsis, serum cytokines, biomarkers, ICU mortality.

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