

## Level of Reactive Oxygen Species and Inflammatory Cytokines in Rheumatoid Arthritis Patients: Correlation with Disease Severity

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**Abstract :** In rheumatoid arthritis (RA), impaired oxidative metabolism and imbalance between pro-and anti-inflammatory cytokines are responsible for causing inflammation and the degradation of cartilage and bone. The present study was done to evaluate the level and hence the role of reactive oxygen species (ROS) and inflammatory cytokines in the pathogenesis of RA. The present study was performed in the blood of 80 RA patients and 55 age and sex-matched healthy controls. The level of ROS (in 5% hematocrit) and the plasma level of pro-inflammatory cytokines [TNF- $\alpha$ , interleukin-6 (IL-6), IL-22] and anti-inflammatory cytokines (IL-4 and IL-5) were monitored in healthy subjects and RA patients. For evaluating the role of rheumatoid factor (RF) in the pathogenesis of RA, patients were sub-divided on the basis of presence or absence of RF. Reactive species and inflammatory cytokines were correlated with disease activity measure-Disease Activity Score for 28 joints (DAS28). The level of ROS, TNF- $\alpha$ , IL-6 and IL-22 were found to be significantly higher in RA patients as compared to the healthy controls, with the increase being more significant in patients positive for rheumatoid factor and those having high disease severity. On the other hand, a significant decrease in the level of IL-4 and IL-10 were observed in RA patients compared with healthy controls, with the decrease being more prominent in severe cases of RA. Higher ROS (indicative of impaired anti-oxidant defence system) and pro-inflammatory cytokines level in RA patients may lead to the damage of biomolecules which in turn contributes to tissue damage and hence to the development of more severe RA. The imbalance between pro-and anti-inflammatory cytokines may lead to the development of multi-system immune complications. ROS and inflammatory cytokines may also serve as a potential biomarker for assessing the disease severity.

**Keywords :** rheumatoid arthritis, reactive oxygen species, pro-inflammatory cytokines, anti-inflammatory cytokines

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