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## Immunological Markers for Early Diagnosis of Rheumatoid Arthritis

**Bobomurodov Umid Nurmurodovich**

Clinical resident of the Bukhara Medical Institute. Uzbekistan

### ABSTRACT

Early diagnosis of rheumatoid arthritis (RA) is essential for timely initiation of disease-modifying therapy and prevention of irreversible joint damage. Immunological markers play a crucial role in identifying autoimmune processes at the early stages of the disease.

**KEYWORDS:** rheumatoid arthritis; early diagnosis; immunological markers; rheumatoid factor; anti-CCP antibodies.

**Introduction.** Rheumatoid arthritis (RA) is a chronic systemic autoimmune disease characterized by persistent synovial inflammation, progressive joint destruction, and functional disability. Early diagnosis of RA is crucial for timely initiation of disease-modifying antirheumatic therapy, which significantly improves clinical outcomes and prevents irreversible structural damage. Immunological markers reflecting autoimmune and inflammatory mechanisms play a key role in the early identification of RA and assessment of disease activity.

**Purpose of the study.** To evaluate the diagnostic value of key immunological markers for early detection of rheumatoid arthritis.

**Materials and methods.** The study included 52 patients with clinically confirmed rheumatoid arthritis, comprising 35 men (67,3%) and 17 women (32,7%). The mean age of patients was  $45 \pm 46$  years. All patients underwent comprehensive clinical and laboratory evaluation. Immunological parameters included rheumatoid factor (RF), anti-cyclic citrullinated peptide antibodies (anti-CCP), and C-reactive protein (CRP). Laboratory assessments were performed using enzyme-linked immunosorbent assay (ELISA) and standardized automated methods. Statistical analysis was conducted using descriptive statistics. Differences were considered statistically significant at  $p < 0.05$ .

**Results.** Elevated rheumatoid factor levels were detected in 38 patients (73,1%), while anti-CCP antibodies were positive in 41 patients (78.8%). Anti-CCP antibodies demonstrated higher diagnostic specificity compared to RF ( $p=0,03$ ), particularly in patients with early-stage disease. Increased CRP levels were observed in 44 patients (84,6%) and showed a significant positive correlation with clinical disease activity scores ( $r = 0,62, p < 0,01$ ). Combined assessment of RF

and anti-CCP antibodies increased the sensitivity of early RA diagnosis to 92,3% ( $p < 0,001$ ), compared with the use of a single immunological marker.

**Conclusions.** Immunological markers, particularly rheumatoid factor and anti-CCP antibodies, are highly informative tools for the early diagnosis of rheumatoid arthritis. The combined use of these markers significantly enhances diagnostic sensitivity and accuracy, allowing earlier identification of RA and more effective treatment strategies. Integration of immunological testing into routine clinical practice may improve prognosis and reduce disease-related disability.

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