

**Arthritis Detection Test :
Early Detection Kit Development Effort for Rheumatoid Arthritis
Patient In Indonesia Based on Autoimmune Marker Matrix
Metalloproteinase-3 (MMP-3)**

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ABSTRACT

Rheumatoid arthritis (RA) is a rheumatic disease characterized by inflammation that causes pain, swelling, stiffness, and decreased of joint function. Prevalence of RA in Indonesia is estimated between 23.6% -31.3%. Inflammation and cartilage degradation are major parts in the pathogenesis of RA. The cartilage degradation is closely related with increasing activity of MMP-3. Detection of joint damage in RA is usually performed using radiological photo technique (X-ray), but the sensitivity is low. Therefore, it required more sensitive and specific diagnostic tool to detect joint damage in RA.

This research uses in vivo experimental design and analytical observation with 18 RA patients (age 42.2 ± 12.1) and 12 non-RA patients (age 38.3 ± 7.3). MMP-3 protein is used to obtain anti-MMP-3 polyclonal, followed by sensitivity and specificity test of anti-MMP-3, Sharp score assessment and concentration and density measurement of MMP-3. Than the evaluation result is analyzed by Independet T-test, linear regression, Pearson correlation, and ROC ($p < 0.05$).

The results showed that MMP-3 protein has 54 kDa molecular weight and induce MMP-3 antibody production. Anti-MMP-3 polyclonal that was produced can recognize antigens of MMP-3 specifically proven by indirect dot blot, indirect ELISA and Western Blot. Sensitivity of anti-MMP-3 is 1:120 serum dilution. There are significant differences between the MMP-3 concentration, MMP-3 density and Sharp score in RA and non RA patients ($p < 0.05$). Pearson correlation showed a very strong correlation between MMP-3 density with MMP-3 concentration and MMP-3 density with Sharp score ($p < 0.01$), whereas correlation between MMP-3 concentration and Sharp score (X-ray) showed a strong correlation ($p < 0.01$). This showed that there are strong correlation between level of joint damage and level of MMP-3 in RA patients. ROC results showed that sensitivity and specificity of detection based on MMP-3 is much better than radiological assesment ($p < 0.001$) with cut off points of MMP-3 density is 10,48, where the density value ≥ 10.48 would be diagnosed as RA patients.

Key words: Rheumatoid Arthritis, Joint Disruption, MMP-3 and Sharp Score.