

**ABSTRACT****THE ROLE OF TOLL-LIKE RECEPTOR-2, TNF- $\alpha$ , IFN- $\gamma$ , IL-4  
IN DIABETES MELLITUS PATIENTS  
WITH PULMONARY TUBERCULOSIS.****Mohamad Isa**

**Background:** The prevalence of diabetes mellitus (DM) among tuberculosis (TB) patients was recorded at 13,3% at Ulin Hospital, Banjarmasin. The World Health Organization (WHO) estimates that 170 million people suffer from DM, and it is estimated that this number will double by 2030. There is a high incidence of DM in the country, and sufferers of DM are also susceptible to a high incidence of TB. The risk of contracting DM is 2,5 times higher than TB.

**Objective :** The objective of this study was to analyze the role of toll-like receptor 2s, TNF- $\alpha$ , IFN- $\gamma$ , and IL-4 in diabetes mellitus patients with pulmonary tuberculosis.

**Method:** This study used an observational-analytic research method, using a cross sectional design. The subject sample was comprised of two groups of thirty patients each from Ulin Hospital, Banjarmasin, distributed among the DM group with TB positive and TB negative conditions. Each group had their toll-like receptor 2 protein expression in PBMCs examined using the immunocytochemistry method. The patients' levels of TNF- $\alpha$ , IFN- $\gamma$ , IL-4 were examined using the ELISA technique. Statistical analysis used two tests and a regression-logistic analysis.

**Result:** The results of the research showed a difference in TLR-2s between TB positive and TB negative patients. In TB positive patients, there was a lower value of TLR-2 (9.3 per 10 HPF) than in TB negative patients (19.3 per 10 HPF), ( $p < 0.05$ ;  $R = 0.358$ ). This means that the risk that a low TLR-2 expression carried of triggering TB was 35.8%. TNF- $\alpha$  examination showed a significant difference in each group with a higher value in TB positive patients (6,2 pg/ml) than TB negative patients (3,2 pg/ml). The level of IFN- $\gamma$  in TB positive patients was higher (4,2 mg/ml) than in TB negative patients (2,3 pg/ml). The level of IL-4 in TB positive patients was higher (6,7 pg/ml) than in TB negative patients (4,5 pg/ml).

**Conclusion:** TLR-2 expression influences TB in DM patients; TNF- $\alpha$ , IL-4 values were all higher in TB+ patients

**Keywords :** DM with TB, TLR-2 expression, TNF- $\alpha$  , IL-4, IFN- $\gamma$ .