

ABSTRACT**THE EFFECT OF PROBIOTICS AND VITAMIN B₁, B₆, B₁₂ ON PLASMA INTERFERON-GAMMA AND TUMOR NECROSIS FACTOR ALPHA LEVELS IN ACTIVE TUBERCULOSIS PATIENTS**

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Background : Interferon-gamma (IFN- γ) and tumor necrosis factor-alpha (TNF- α) are pro-inflammatory cytokines that have important role in tuberculosis (TB) pathogenesis. In TB infection, production of IFN- γ and TNF- α are disrupted and probiotics and vitamin B₁, B₆, B₁₂ were expected to regulate the cytokines through macrophage and natural killer (NK) cells activity.

Objectives : To analyze the effect of probiotics and vitamin B₁, B₆, B₁₂ on altering IFN- γ and TNF- α levels in TB patients.

Method : Data was collected from September 2016 to January 2017 and had been approved by ethics and law committee of Airlangga University Teaching Hospital. Patients who met the inclusion criteria were divided into two groups by systematic randomisation. Plasma IFN- γ and TNF- α levels were measured by the ELISA before, after 4 weeks, and after 8 weeks.

Result : In this study, 11 patients were included in each group. The baseline characteristics between two groups were similar. Plasma levels of IFN- γ in treatment group were increased after 4 weeks ($p = 0.178$) and decreased significantly after 8 weeks ($p = 0.004$) as compared with the control group. On the other hand, plasma level of TNF- α in treatment group was decreased after 4 weeks ($p = 0.352$) and increased after 8 weeks ($p = 0.974$). Beside IFN- γ and TNF- α levels, the effect of supplements could be seen from patients' clinical condition improvements.

Conclusion : The use of probiotics and vitamin B₁, B₆, B₁₂ in TB patients showed benefit after 8 weeks of treatment.

Keywords : interferon-gamma, probiotics, tuberculosis, tumor necrosis factor-alpha, vitamin B