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Abstract

Tuberculosis caused by Mycobacterium tuberculosis may lead to death. The condition may be more complicated when the cause is genetical. The purpose of this study was to evaluate the role of gene polymorphisms D543N natural-resistance-associated macrophage protein 1 (NRAMP1) and the expression of NRAMP1 in nurses and patients with pulmonary tuberculosis. NRAMP1 gene polymorphism D543N occurs because there are nucleotide changes at codon 543 in exon 15, which displacement causes a change to aspartic acid asparagin. NRAMP1 gene is expressed not only in macrophages but also in blood cells, known as peripheral blood mononuclear cells (PBMC). NRAMP1 gene encodes a protein. Transport protein NRAMP1 is a bivalent metal ion that serves as a channel for divalent ions including Fe\(^{2+}\) ions. Fe\(^{2+}\) ions can inhibit the growth of \(M.\) tuberculosis and will eventually kill \(M.\) tuberculosis. If there is a mutation in NRAMP1 gene producing proteins that are not functional or the NRAMP1 mutations causes decrease in NRAMP1 protein expression, so that the growth inhibition of \(M.\) tuberculosis will be lost or reduced, causing the germs will breed freely in pulmonary alveolar macrophages. Variant result of genotype A/A polymorphism D543N occurs only in patients with pulmonary tuberculosis. Mean protein expression of NRAMP1 in nurses is higher than that in pulmonary tuberculosis patients. In conclusion, the polymorphism D543N A allele tends to cause decrease in mean NRAMP1 expression, so that the variant genotype A/A gene NRAMP1 D543N polymorphism is the gene that causes susceptibility to \(M.\) tuberculosis infection.

Keyword : NRAMP1, gene, polymorphisms, D543N, expression, NRAMP1, pulmonary, tuberculosis.

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