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Correlation expression Toll-like receptor 4 with multidrugs resistant tuberculosis in diabetes mellitus condition

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Highlights

- Toll-like receptor (TLR) are ligand homologous protein in the antigen presenting cell membrane that has functions as a receptor to trigger leukocytes and innate immune responses. The interaction between *M. tuberculosis* and the TLR-4 receptors will produces chemokines which induce migration of monocytes and dendrite cells for destruction. Diabetes condition will reduce immune cell phagocytes bacteria and trigger severe infections including in Tuberculosis (TB) infection. The consequences of more severe infection and metabolic disorders that occur make a person more likely to experience Multidrugs resistant TB. Not much data that reports on the expression of TLR4 as a ligand that triggers an immune response in conditions of MDR and DM. We try to find out expression of TLR4 during MTB MDR infection and diabetes in animal models.

Abstract

Background

Toll-like receptor (TLR) are ligand homologous protein in the APC cell membrane that has functions as a receptor to triger leukocytes and innate immune responses. When there is a *Microbacterium tuberculosis* (MTB) infection enters from droplets to the lungs, the alveolar macrophages perform a phagocytic function. The interaction between *M. tuberculosis* and the TLR macrophage receptors produces chemokines which induce migration of monocytes and dendrite cells for destruction. Diabetes militus (DM) has become risk factor for developing tuberculosis. DM condition will reduce immunity and the ability of immune cell phagocytes bactery and triger severe infections. The consequences of more severe infection and metabolic disorders that occur make a person more likely to experience Multidrugs resistant MTB. Not much data that reports on the expression of TLR4 as a ligand that triggers an immune response in conditions of MDR and DM. We try to find out correlation between TLR-4 in MDR MTB, diabetes and level of MTB bacteria in experimental animals.

Methods

We conducted an experimental study on 30 experimental mice weighing 25 grams consisting of negative control grub, infected with MTB, infected with MDR MTB, negative control diabetes, MTB DM, MDR MTB DM. DM animals were induced by streptozosin to experience DM, then in the treatment of infection, intraperitoneal MTB and MDR MTB bacterial injections were given. Termination was carried out on day 14. We count number of bacteria level in the lungs and perform evaluation TLR4 from blood sampel.

Results

The negative control group had mean TLR value of 1.47 (± 0.46) while the MTB group showed an increase in TLR 9.22 (± 0.39) followed by MDR MTB 9.50 (± 0.29), DM negative control 9, 21 (± 0.24) and more increasing in conditions of DM MTB 13.36 (± 0.32) and DM MDR MTB 13.35 (± 0.34). ANOVA analysis showed a significant difference (P = 0.00). pearson correlation analysis find strong correlation TLR4 in MTB and MDR MTB with diabetes.

Conclusion

there were a significant difference level TLR4 between MTB and MDR TB infection with diabetes. higher TLR4 level higher in DM MTB, DM MDR MTB. TLR 4 strong correlates with an increase in the number of MTB bacteria.

Keywords

Microbacterium tuberculosis; Multidrugs resistance; TLR4; Diabetes militus

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PAGE 1

PAGE 2

PAGE 3