World Academy of Science, Engineering and Technology
International Journal of Medical and Health Sciences
Vol:17, No:06, 2023

The Role of Immunologic Diamonds in Dealing with Mycobacterium Tuberculosis; Responses of Immune Cells in Affliction to the Respiratory Tuberculosis

Authors : Seyyed Mohammad Amin Mousavi Sagharchi, Elham Javanroudi

Abstract : Introduction: Tuberculosis (TB) is a known disease with hidden features caused by Mycobacterium tuberculosis (MTB). This disease, which is one of the 10 deadliest in the world, has caused millions of deaths in recent decades. Furthermore, TB is responsible for infecting about 30% population of world. Like any infection, TB can activate the immune system by locating and colonization in the human body, especially in the alveoli. TB is granulomatosis, so MTB can absorb the host's immune cells and other cells to form granuloma. Method: Different databases (e.g., PubMed) were recruited to prepare this paper and fulfill our goals to search and find effective papers and investigations. Results: Immune response to MTB is related to T cell killers and contains CD1, CD4, and CD8 T lymphocytes. CD1 lymphocytes can recognize glycolipids, which highly exist in the Mycobacterial fatty cell wall. CD4 lymphocytes and macrophages form granuloma, and it is the main line of immune response to Mycobacteria. On the other hand, CD8 cells have cytolytic function for directly killing MTB by secretion of granulysin. Other functions and secretion to the deal are interleukin-12 (IL-12) by induction of expression interferon-γ (INF-γ) for macrophages activation and creating a granuloma, and tumor necrosis factor (TNF) by promoting macrophage phagolysosomal fusion. Conclusion: Immune cells in battle with MTB are macrophages, dendritic cells (DCs), neutrophils, and natural killer (NK) cells. These immune cells can recognize the Mycobacterium by various receptors, including Toll-like receptors (TLRs), Nod-like receptors (NLRs), and C-type lectin receptors (CLRs) located in the cell surface. In human alveoli exist about 50 dendritic macrophages, which have close communication with other immune cells in the circulating system and epithelial cells to deal with Mycobacteria. Against immune cells, MTB handles some factors (e.g., cordfactor, O-Ag, lipoarabinomannan, sulfatides, and adenylate cyclase) and practical functions (e.g., inhibition of macrophages).

Keywords : mycobacterium tuberculosis, immune responses, immunological mechanisms, respiratory tuberculosis
Conference Title : ICMMIID 2023 : International Conference on Medical Microbiology, Immunization and Infectious Diseases
Conference Location : Toronto, Canada
Conference Dates : June 19-20, 2023