Investigation of the Role of the Vδ2 γδT Cell Subtype in the Immune Response Against *Mycobacterium tuberculosis* via Chemokine Receptors CCR5 and CXCR3

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Tuberculosis (TB) remains one of the most widespread infectious diseases globally. According to recent reports from the World Health Organization (WHO), the number of TB cases worldwide has reached 10.8 million, demonstrating an increasing trend compared to previous years. Despite continuous improvements in the availability of diagnostics and treatment, research into the pathogenesis, control, and prevention mechanisms of tuberculosis remains a pressing priority.

The aim of the present study was to characterize the phenotypic features of γδ T cell subtypes in patients with active pulmonary tuberculosis. The frequencies of Vδ1 and Vδ2 T cells in peripheral blood were determined, and their expansion and migration-related characteristics were assessed through phenotypic analysis. The study included newly diagnosed, untreated patients presenting with active pulmonary TB. Peripheral blood mononuclear cells (PBMCs) isolated from these patients were analyzed using flow cytometry with monoclonal antibodies against CD183 (CXCR3), CD195 (CCR5), and CD45RA. For statistical analysis, the non-parametric Mann–Whitney U test was used, and differences were considered statistically significant at $P < 0.05$.

The results showed no significant change in the frequency of Vδ1 T cells in TB patients, whereas the proportion of Vδ2 T cells was significantly increased. Both subsets exhibited high expression levels of chemokine receptors (CXCR3 and CCR5) and the CD45RA marker, indicating their activation and potential for migration in response to infection.

These findings support the notion that γδ T cell subtypes play a significant role in the immune response to pulmonary tuberculosis. The elevated expression of chemokine receptors suggests their involvement in chemotaxis directed against *Mycobacterium tuberculosis*. This evidence provides a basis for the potential use of γδ T cells in future diagnostic and therapeutic approaches.