

# Immunophenotyping of Circulating Mononuclear Cells in Active Pulmonary Tuberculosis

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## Abstract

**Introduction:** Interpreting the interactions between *M. tuberculosis* and the host innate and adaptive immune defense mechanisms, is mandatory for understanding the pathogenesis of active pulmonary TB (APT<sub>B</sub>). The aim was to describe the distribution of mononuclear cells in APT<sub>B</sub> and their relation to disease severity.

**Methodology:** A case-control study of peripheral blood CD4<sup>+</sup> T cells, CD8<sup>+</sup> T cells, B lymphocytes, NK cells, T regulatory lymphocytes (Tregs) and monocytes by flow cytometry. The patients had clinical presentations of APT<sub>B</sub>, positive tuberculin skin tests, acid-fast bacilli smears and sputum cultures using BACTEC 960.

**Results:** There was a significant decrease in the haemoglobin level and the absolute lymphocytic count ( $p < 0.01$ ), while both the neutrophil count and erythrocyte sedimentation rate showed significant increase in the APT<sub>B</sub> patients compared to HC with  $p$ -values  $< 0.001$  and  $< 0.0001$  respectively. Both the CD4<sup>+</sup>/CD8<sup>+</sup> ratio and the percentages of CD3<sup>+</sup>–CD19<sup>+</sup> cells were significantly lower in APT<sub>B</sub> patients ( $p = 0.03$  and  $p = 0.005$  respectively). The percentages of CD4<sup>+</sup>, CD8<sup>+</sup>, CD3<sup>+</sup>–CD19<sup>+</sup>, CD14<sup>+</sup>, and CD3<sup>+</sup>–CD(16+56)<sup>+</sup> cells showed no significant differences, when comparing either disease severity groups, or cavitated and non-cavitated groups of APT<sub>B</sub> patients. There was significant increase in the CD4<sup>+</sup>25<sup>+</sup> lymphocytes in the advanced APT<sub>B</sub> patients than in the mild disease group ( $P < 0.05$ ).

**Conclusion:** B lymphocytes and CD4/CD8 ratios were significantly lower in the APT<sub>B</sub> patients than controls with no association with disease severity. CD4<sup>+</sup> CD25<sup>+</sup>hi Tregs were significantly higher in the advanced versus mild groups.