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[Clin Infect Dis.](#) 2020 Aug 7;ciaa1104. doi: 10.1093/cid/ciaa1104. Online ahead of print.

# Plasma chemokines are baseline predictors of unfavorable treatment outcomes in pulmonary tuberculosis

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PMID: 32766812 DOI: [10.1093/cid/ciaa1104](#)

## Abstract

**Background:** Plasma chemokines are biomarkers of greater disease severity, higher bacterial burden and delayed sputum culture conversion in pulmonary tuberculosis (PTB). Whether plasma chemokines could also serve as biomarkers of unfavorable treatment outcomes in PTB is not known.

**Methods:** A cohort of newly diagnosed, sputum smear and culture positive adult individuals with drug-sensitive PTB were recruited under the Effect of diabetes on Tuberculosis Severity study in Chennai, India. Plasma chemokine levels measured before treatment initiation were compared between 68 cases with unfavorable outcomes (treatment failure, death or recurrence) and 136 control individuals who had recurrence-free cure. A second validation cohort comprising of newly diagnosed, culture positive adults with drug-sensitive TB was used to measure plasma chemokine levels in 20 cases and 40 controls.

**Findings:** Six chemokines (CCL2, CCL3, CCL4, CXCL8, CXCL10 and CX3CL1) were associated with increased risk, while CXCL1 was associated with decreased risk of unfavorable outcomes in unadjusted and adjusted analyses in the test cohort. Similarly, CCL3, CXCL8 and CXCL10 were associated with increased risk of unfavorable treatment outcomes in the validation cohort. Receiver operating characteristic analysis revealed combinations of CCL3, CXCL8 and CXCL10 exhibited very high sensitivity and specificity in differentiating cases versus controls.

**Conclusions:** Our study reveals a plasma chemokine signature that can be used as a novel biomarker for predicting adverse treatment outcomes in PTB.

**Keywords:** Treatment outcomes; Tuberculosis; chemokines.

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