KINETICS OF ALVEOLAR REGULATORY T CELLS DURING TREATMENT OF PULMONARY TUBERCULOSIS IN MALAWIAN ADULTS

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Background
Tuberculosis (TB) is a major public health challenge, particularly in sub-Saharan African countries where there is high HIV burden. Expansion of regulatory T cells (Tregs) during the untreated TB infection is associated with increased bacterial load and delayed onset of mycobacterium-specific $CD4^+$ T cell responses. In this study, we aimed to investigate whether the frequency of Tregs changes during treatment of microbiologically confirmed pulmonary tuberculosis.

Methods
We recruited 5 TB+/HIV- and 5 TB+/HIV+ participants, and 7 TB-/HIV- controls from Queen Elizabeth Central Hospital, Blantyre, Malawi. Bronchoalveolar lavage (BAL) was performed on participants at 2 months and 4 months into TB treatment. All HIV-infected individuals also received antiretroviral therapy (ART). To identify Tregs, BAL cells were stained with antibodies against CD4, CD25, CD127 and FoxP3 for flow cytometric analysis.

Results
We found that the frequency of Tregs was significantly higher at 2 months compared to 4 months into TB treatment (paired, 3.2 vs. 5.0%, p=0.0027). The frequency of Tregs was higher in HIV-infected TB patients compared to HIV-uninfected TB patients at 2 months (6.80% vs. 3.28%, p=0.049) and 4 months (4.64% vs. 1.66%, p=0.053) post TB treatment. The frequency of Tregs was similar between TB patients at 4 months post TB treatment compared to TB-negative controls (3.15% vs. 2.74%, p=0.69).

Conclusion
Our results show dynamic changes in the population of Tregs in the lungs of patients with pulmonary TB. These changes suggest that anti-TB treatment is associated with reduction in inhibitory anti-TB immune response through reduction in the proportion of Tregs in the lung. Subsequent work will explore whether this is linked to effective TB control and successful treatment outcome