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## Prediabetes and the extension of pulmonary tuberculosis in patients with drug-susceptible tuberculosis

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**Background:** Prediabetes is frequent in patients with pulmonary tuberculosis (PTB). It may occur due to an inflammatory response induced by cytokines as a consequence of tuberculosis infection. Likewise, hyperglycemia may lead to a proinflammatory response and a subsequent progression of disease. In contrast to diabetes mellitus (DM), there is little evidence if prediabetes may be associated with an extension and/or poor prognosis of tuberculosis. We determine the association between prediabetes and the extension of PTB in drug-susceptible cases.

**Methods:** We included 180 consenting adults with newly diagnosed, previously untreated, smear positive ( $\geq 2+$ ) PTB from East and North Lima, Peru, between 2013 to 2015. All participants were susceptible to isoniazid and rifampin by GenoType MTBDRplus 2.0 and met other eligibility criteria for the parent study. Baseline glycosylated hemoglobin (HbA1c) was measured to determine prediabetes (5.7-6.4%) and chest X-ray was interpreted by a pulmonologist to define limited, moderate and extensive tuberculosis. We do a cross-sectional analysis. We dichotomized the outcome in limited vs moderate-extensive. Confounders collected at baseline were included in the regression. We used Log-Poisson (robust) to determine prevalence ratio (PR).

**Results:** We excluded 4 patients from the analysis: one had DM and three had not HbA1c and X-ray data. A total of 30 (17.1%) patients had prediabetes and 104 (59.1%) had moderate-extensive PTB. Compared to patients with limited disease, patients with moderate-extensive PTB showed a higher PR of prediabetes (8.3% vs 23.1%;  $p=0.011$ ). In multivariable analysis patients with prediabetes were 42% more likely to have moderate-extensive PTB than those without prediabetes (PR 1.42; 1.12-1.80,  $p=0.004$ ).

**Conclusion:** Prediabetes was common in this population. We found an association between prediabetes and the extension of PTB in drug-susceptible cases. It is likely that prediabetes is exacerbating the progress of PTB disease. However, we can not determine causality in this study. Longitudinal studies including patients with multidrug and extensively drug-resistant tuberculosis would describe better this association.