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DEFINING THE BURDEN OF PULMONARY TUBERCULOSIS AND PROBING THE PREVALENCE OF PNEUMOCOCCAL BACTERIAL CO-INFECTIONS AMONG CHILDREN HOSPITALISED WITH PULMONARY TUBERCULOSIS THAT WERE ENROLLED IN A PNEUMOCOCCAL VACCINE TRIAL

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ABSTRACT

Background

In settings with a high burden of tuberculosis, children with unrecognised culture-confirmed pulmonary tuberculosis (PTB) may be discharged from hospital before mycobacterial culture results are available; in these cases clinical improvement may have been due to successful treatment of an intercurrent viral or bacterial co-infection.

Aim

To estimate the burden of tuberculosis in children who were enrolled in a double-blind, placebo-controlled pneumococcal conjugate vaccine (PCV) trial, and to probe for the presence of pneumococcal co-infection in trial participants who had a hospital-based diagnosis of PTB.

Methods

A retrospective case-finding strategy was adopted in order to define the tuberculosis case load amongst 39 836 children that had been enrolled in a PCV efficacy trial in Soweto,

Gauteng Province. The trial follow-up period was 5.3 years. Children with a hospital-based diagnosis of tuberculosis were categorised by strength of evidence for the disease, HIV status and PCV vaccination status. Incidence rates and risk ratio assessments were conducted using standard statistical methods.

Results

Four-hundred and ninety-two episodes of tuberculosis arose amongst 425 of the 39 836 PCV Study participants. Tuberculosis incidence was 1067 per 100 000 children (95% Confidence Interval [CI], 968 – 1173), with the greatest burden observed amongst HIV-infected children (10 633 per 100 000 children [95% CI, 9411 – 11 969]; Risk Ratio [RR] 27.5 [95% CI, 22.6 – 33.5], P<0.001). The burden of PTB in the cohort was 982 cases per 100 000 children (95% CI, 887 – 1084): 9895 per 100 000 (95% CI, 8718 – 11 187) in the HIV-infected children and 352 per 100 000 (95% CI 294 – 417) in the HIV-uninfected children (RR 28.1; 95% CI, 22.9 – 34.6), P<0.001.

PCV recipients exhibited a 44 percent (95% CI, 11 – 65), P=0.010, reduction in incident culture-confirmed PTB compared to placebo recipients; this apparent reduction was demonstrated chiefly in PCV-vaccinated HIV-infected children (RR 0.53; 95% CI, 0.31 – 0.90) compared to HIV-infected placebo recipients, P=0.017.

Conclusions

A high burden of tuberculosis is carried by children under 5.3 years in the study setting, with HIV-infected children bearing the brunt of the morbidity. Pneumococcal co-infections are common in the context of hospitalised PTB in the study setting.

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