Effects of Maternal and Infant Co-infections, and of Maternal Immunization, on the Infant Response to BCG and Tetanus Immunization

Alison M. Elliot; Patrice A. Mawa; Emily L. Webb; Margaret Nampijja; Nancy Lyadd; Joseph Bukusuba; Moses Kizza; Proscovia B. Namujju; Juliet Nabulime; Juliet Ndibazza; Moses Muwanga; James A. G. Whitworth

Abstract

Some vaccines show poor efficacy in tropical countries. Within a birth cohort in Uganda, we investigated factors that might influence responses to BCG and tetanus immunisation. Whole blood assay responses to crude culture filtrate proteins of Mycobacterium tuberculosis (cCFP) and tetanus toxoid (TT) were examined among 1506 and 1433 one-year-olds, respectively. Maternal Mansonella perstans infection was associated with higher interleukin (IL)-10 responses to both immunogens but no reduction in gamma interferon (IFN-), IL-5 and IL-13 responses; other maternal helminth infections showed little effect. Tetanus immunisation during pregnancy was associated with higher infant responses to TT; maternal BCG scar (from past immunisation) with lower infant IL-5 and IL-13 responses to cCFP. IFN-, IL-5 and IL-13 to TT were reduced in HIV-exposed-uninfected infants; infant malaria and HIV were associated with lower IFN-, IL-5 and IL-13 responses to both immunogens. We conclude that maternal helminth infections are unlikely to explain poor vaccine efficacy in the tropics. Effects of maternal immunisation on infant responses to vaccines should be explored. Prevention of infant malaria and HIV could contribute to effectiveness of immunisation programmes.

Key Words: Maternal & Infant Co-infections; Immunization; BCG and Tetanus