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

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Abstract

Some vaccines show poor efficacy in tropical countries. Within a birth cohort in Uganda, we investigatedfactors that might influence responses to BCG and tetanus immunisation. Whole blood assay responsesto crude culture filtrate proteins ofMycobacterium tuberculosis(cCFP)) and tetanus toxoid (TT) wereexamined among 1506 and 1433 one-year-olds, respectively. MaternalMansonella perstansinfection wasassociated with higher interleukin (IL)-10 responses to both immunogens but no reduction in gammainterferon (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; maternalBCG scar (from past immunisation) with lower infant IL-5 and IL-13 responses to cCFP. IFN-, IL-5 andIL-13 to TT were reduced in HIV-exposed-uninfected infants; infant malaria and HIV were associatedwith lower IFN-, IL-5 and IL-13 responses to both immunogens. We conclude that maternal helminthinfections are unlikely to explain poor vaccine efficacy in the tropics. Effects of maternal immunisation oninfant responses to vaccines should be explored. Prevention of infant malaria and HIV could contributeto effectiveness of immunisation programmes.

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