Worms and Pediatric Human Immunodeficiency Virus Infection and Tuberculosis

To the Editor—Some useful data on human immunodeficiency virus (HIV) levels in African infants have been provided by Biggar et al. [1], and the virus load in HIV-infected children has been found by Kalish et al. [2] to be associated with the rate of disease progression. What is becoming increasingly obvious is that various factors influence the speed with which individuals in different parts of the world develop AIDS [1–4]. We wish to draw attention to an additional, and possibly highly relevant, factor in the whole conundrum.

Exposure to helminthic antigens in utero has been found to generate cytokine responses similar to those observed in adults, and these immune reactions persist into childhood [5]. Whether this has implications for pediatric HIV infection and tuberculosis (TB) needs to be investigated. The reason is that the immunological type 2 response which predominates in helminthiasis is thought to adversely influence the course of HIV and Mycobacterium tuberculosis infection and to decrease the efficacy of vaccines [5–8]. Because the type 2 situation is characterized by eosinophilia, it is important to investigate whether the eosinophil itself [7, 8] has a direct role in determining virus levels [1, 2].

Progression to AIDS among African children, who frequently harbor large numbers of worms, is said to be more rapid than among their counterparts in Europe or the United States [9]; however, the timing of HIV transmission may account for some of the differences [4]. Likewise, a young child living in an area with a high prevalence of TB might, as a result of intrauterine exposure to helminthic antigens, be at greater risk of developing clinically evident TB than a child who has not been prenatally sensitized to worm antigens.

Markers for a type 2 response in helminthiasis include an elevated IgE concentration and a high eosinophil count. Both are significantly reduced by successful treatment of helminthic infection, suggesting that a shift to a type 1 profile has taken place. The type 1 pattern is thought to provide better protection against progression of HIV and M. tuberculosis infection [6–8], and it certainly protects better against reactivation of TB [10]. To help elucidate the immunological mechanisms involved in resistance and susceptibility to pediatric HIV/AIDS and TB, studies using mass anthelmintic chemotherapy would be appropriate in areas where the prevalence of helminthiasis is high, particularly where vaccination strategies are being contemplated for controlling HIV in adults or controlling TB in adults or children [5].

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References