

## Correspondence

### Leishmaniasis, malaria, and schistosomiasis concurrently in an 8-year-old boy

*To the Editor*

The concurrent occurrence of 3 infections; namely, leishmaniasis, malaria, and schistosomiasis in the studied patient by Bin Mohanna<sup>1</sup> is really amazing. This is based on the notion that there is a mutual correlation between immunity and infection, and it is supported by the following 2 points. 1) Various infections, particularly parasites still impose a high death and disability burden on human populations, and are therefore, likely to act as selective factors for genetic adaptations. Evidence is increasing that at least some of the identified susceptibility loci are shared not only among parasitic diseases, but also with immunological disorders such as allergy or autoimmune disease, suggesting that parasites may have played a role in driving the evolution of the immune system.<sup>2</sup> 2) In many parts of the developing world, high vulnerable groups, including the young, the malnourished, and human immunodeficiency virus (HIV)-infected individuals, and the wider general population are under constant immune pressure from a range of environmental factors, under-nutrition, and multiple concurrent infections from birth through adulthood. Intermittent microbial exposure during childhood is required for the generation of naturally acquired immunity capable of protection against a range of infectious diseases in adult life. However, in the context of a resource-poor setting, the heavy burden of various infections in childhood may subvert or suppress immune responses rather than protect, resulting in sub-optimal immunity. Poor maternal health, HIV exposure, low socio-economic standards, and seasonal factors conspire to weaken childhood immune defenses to disease and that recurrent infections might drive immune dysregulation, leading to relative immune senescence and premature immunological aging.<sup>3</sup> Among the main threats to immunity and hence, increasing the propensity to be concurrently infected with serious infections, HIV should be seriously considered. Though no studies on the prevalence of pediatric HIV infection in Yemen are yet present due to the absence of reliable national surveillance, information points to a steadily growing epidemic since 1990, when the first AIDS case was reported. The HIV seroprevalence in 1995 was 0%, 0.17% in 1996, and 1.26% in 1998, and 1.19% in 2000.<sup>4</sup> In 2013, HIV prevalence rate in adults aged

15-49 years was reported to be 0% [0-0.1%] and the number of children aged 0-14 years living with HIV was estimated to be [-1,200].<sup>5</sup> I presume that HIV infection ought to be critically considered in the studied patient by Bin Mohanna<sup>1</sup> and CD4 count and viral overload estimations were supposed to be carried out. However, limited financial resources had probably halted Bin Mohanna<sup>1</sup> from arranging for these laboratory measurements. Despite that limitation, the concurrent 3 infections in the studied patient is exceptional and it could be confidently added to the literature as a novel case report.

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#### *Reply from the Author*

I would like to thank Prof. Al-Mendalawi for his comment on our paper and I appreciate his sharing his thoughts and experience in this field, which creates a rich scientific discussion forum. Regarding the comment of Prof Al-Mendalawi, I would like to clarify the following: 1) visceral leishmaniasis (VL) is a serious disease, which is lethal if left untreated. It occurs in irregular, periodic epidemic and affects older children and young adults in Asia and Africa. Some areas in Yemen are endemic for Leishmaniasis, malaria, and schistosomiasis.<sup>6,7</sup> Our case is an 8-year-old presented with prolonged fever, hepatosplenomegaly, and diarrhea. His blood film was positive for *Plasmodium falciparum* malaria, and his stool was positive for *Schistosoma mansoni*. His siblings and parents were healthy. After 4 weeks bone marrow aspiration was carried out revealing Leishman-Donovan bodies (amastigote form). The patient was successfully treated for malaria, schistosomiasis, and later on for leishmaniasis despite the delay in the diagnosis. He was followed up regularly at the clinic, and after 4 months at discharge, he was examined, and there was complete remission of the symptoms and weight gain with remarkable regression of the spleen and liver. 2) HIV infection in children progresses more rapidly and it is correlated with higher viral burden and faster depletion of infected CD4 lymphocytes in infants and children than in adult. Opportunistic infections are generally seen in children with severe depression of the CD4 count. Visceral leishmaniasis, behave as opportunistic infections in immuno-compromised HIV-infected people. Coinfections are more being reported in India, it

has the highest global burden of leishmaniasis and a high rate of resistance to antimonial drugs.<sup>8</sup> The diagnosis of leishmaniasis in HIV-infected patients may be difficult due to clinical variations from non-specific to atypical features found in most cases. Moreover, the presence of clinical signs such as splenomegaly and hepatomegaly is typically less frequent in patients with this coinfection.<sup>8</sup> The clinical manifestation and prognosis of VL in HIV-infected individuals differ significantly from those in non-HIV-infected individuals. Visceral leishmaniasis-HIV coinfection has been significantly lower cure rates, higher drug toxicity,<sup>9</sup> higher relapse rates, and higher mortality rates 4 than those for VL in non-HIV-infected individuals. 3) Despite the low rate of HIV infection in Yemen, there are concerns on the possible spread of HIV among high-risk and vulnerable groups. A study in Yemen by Al-Serouri et al<sup>10</sup> on AIDS awareness and attitudes among 601 young people aged 15-24 years from low-income, high-risk neighborhoods in Aden that revealed prevalence of misconceptions about modes of transmissions.

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