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THE LETTER TO THE EDITOR

Mono-parasite infection versus co-infections in Tanzania: the need to revise our research focus

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Parasitic infectious agents in endemic African countries including Tanzania rarely occurs in isolation and co-infections within a single host in populations are norms rather than exceptions (Brooker *et al*., 2007; Mazigo *et al*., 2010a; Mboera *et al*., 2011). Co-infection refers to a situation in which an individual harbours two or more infections from different species simultaneously, where as mono-infection refers to a situation in which an individual harbours only one infection from a single species (Brooker *et al*., 2007). Several factors determines the wide geographical distributions of helminth and protozoan parasites and they include climate, environment, socio-economic status, human behaviour and host-specific factors such as genetics, host physiology, host immunological status and population dynamics (Mwangi *et al*., 2007).

In general, multiple parasitic infections in single host tend to cause more severe morbidities as compared to single infections. For example, the consequence of co-infections of malaria and hookworm is anaemia (Brooker *et al*., 2006). Recent studies have shown that helminth infections may alter host susceptibility to clinical malaria (Druilhe & Tall, 2005). Similarly, malaria may also exacerbate the consequences of helminth infections (Mwangi *et al*., 2007; Mboera *et al*., 2011). In school-age children infection with *Schistosoma mansoni* is commonly associated with hepatomegaly and splenomegaly as a result of eosinophilic inflammatory and granulomatous reactions against parasite eggs trapped in host tissues (Gryseels *et al*., 2006). Similarly, atypical immune responses to repeated or chronic *Plasmodium falciparum* infection are also an important cause of hepatomegaly and splenomegaly in the tropics (Grobusch & Kremsner, 2005). On the other hand, parasitic infections in sub Saharan Africa are known to interact with viral infections such as HIV-1 and cause severe morbidities in co-infected individuals (Walson *et al*., 2008).

Despite the fact that parasitic co-infections are known to occur and cause multiple morbidities, yet most parasitic diseases are still studied individually and data on prevalence, morbidity and mortality associated with multiple parasitic infections in Tanzania are limited (Mazigo *et al*., 2010a; Mboera *et al*., 2011). Importantly, even the planning for prevention and control activities are designed to focus on single infection.

This lack of research information on parasitic co-infections in Tanzania hinders the ability to accurately assess the disease burden attributable to individual infections

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and hampers development of informed policy decisions. Research on polyparasitism will allow the identification of common risk factors that could help streamline prevention and control efforts. This is particularly true for integrated control programmes which if instituted will target multiple diseases which are highly endemic in the country. For example the ongoing scaling up and universal distribution of insecticides treated nets for malaria control in Tanzania, could be integrated with distribution of anthelminthics among the underfives. This will only be possible if the factors which determine the epidemiology of multiple parasitic infections are well known and the delivery mechanisms of the different interventions strategies are made clear.

In conclusion, interventions to reduce the burden of parasitic infections call for researchers to have new focus and change their research objectives. Clearly, there is a need to understand the basic epidemiology of multiple species infections in different transmission zones in the country for better planning of integrated interventions strategies. In addition, the limited funds received for research and control activities instead of being focused for single parasitic diseases can be well utilized for integrated control and prevention activities that have the potential to significantly reduce burdens of multiple parasitic diseases. This will only be possible if most of the research agendas are changed from reporting single to reporting the occurrences of multiple parasitic infections and their associated morbidities in populations living in different epidemiological settings in the country.

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