

“Modulation of the metabolic and immunological profile by filariae and its impact on NCDs”

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Animal studies have demonstrated that helminth immunomodulation can protect against a variety of autoimmune and metabolic diseases. Findings from human studies are less conclusive, but individual studies observed a beneficial impact of helminth infections on selected metabolic markers and prevalence of type 2 diabetes. Given that helminth infections are most prevalent in sub-Saharan Africa and the strongest increase of type 2 diabetes will occur in sub-Saharan Africa reaching an 134% increase by 2045, as predicted by the international diabetes federation, we investigated the impact of human filarial infections on the metabolic profile in rural Cameroon. In an open label pilot trial, a total of 1619 participants infected with the filarial nematodes *Onchocerca volvulus* (causative agent of river blindness), *Loa loa* (African eye worm), *Mansonella perstans* (mansonellosis – often no specific symptoms), multiple filarial species or filariae-free endemic participants, were grouped according to their BMI as lean, overweight or obese and analysed for their parasitological, anthropomorphic and metabolic profile. Our data demonstrate that filariae-infected participants had significantly reduced levels of circulating liver enzymes as well as increases of markers associated with kidney health. Similarly, C-reactive protein, a marker associated with obesity-derived inflammation, was significantly reduced in filariasis patients. Most importantly, levels of the main diagnostic marker for diabetes, glycated hemoglobin (HbA1c), were significantly reduced in filariasis patients and diabetes prevalence was significantly lower in filariasis patients in comparison to filariae-free participants (31% vs. 13.4%). Comparing the impact of *O. volvulus*, *L. loa* and *M. perstans* infection indicated filarial-species dependent differences with *M. perstans* infections correlating with the strongest beneficial impact on liver enzymes, CRP levels, kidney markers, and lowest rate of diabetes prevalence. Taken together, our study suggests that filarial infections improve metabolic parameters and protect against the development of type 2 diabetes with *M. perstans* infected individuals showing the most striking effects. Ongoing analyses assess the immunological profile and the impact of anthelmintic treatment on the metabolic and immunological profile.