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**Helminth - *Mycobacterium leprae* co-infections: Facilitators of leprosy transmission and morbidity or innocent bystanders?**

By

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**Helminth - *Mycobacterium leprae* co-infections: Facilitators of leprosy transmission and morbidity or innocent bystanders?**

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An abstract of

a thesis submitted to the Faculty of the

Rollins School of Public Health of Emory University

in partial fulfillment of the requirement for the degree of

Master of Public Health

In Global Epidemiology

2016

**Abstract**

**Helminth - *Mycobacterium leprae* co-infections: Facilitators of leprosy transmission and morbidity or innocent bystanders?**

By

Jessica Kathleen Fairley, MD

Background: The immune derangements of helminth infections and evidence that co-infections may shift the presentation of leprosy to the lepromatous end of the spectrum suggest that they could be risk factors for both leprosy transmission and for the serious immunologic reactions. Methods: We conducted two investigations: a case-control study on helminth co-infections and leprosy reactions and a geospatial study on spatial associations of schistosomiasis and leprosy in Minas Gerais, Brazil. Adult patients with multibacillary disease were recruited from a leprosy clinic in Belo Horizonte. Cases included those with active Type 1 (T1R) or Type 2 reaction (T2R) and controls included those without reactions. Data were abstracted from charts and questionnaires, and stool and blood tested for helminth infections. Adjusted odds ratios were calculated with helminth infection as the main exposure and T1R or T2R as the outcomes. For the geospatial study, all new cases of *M. leprae* and *Schistosoma mansoni* infections from 2007-2014 were retrieved from SINAN, the Brazilian national notifiable disease network, for seven municipalities. Cases were mapped to municipality and neighborhood levels. A stratified analysis was conducted to identify spatial associations between the two infections. Results: Seventy-three patients were recruited to the case-control study. Helminth infections were found in 4 patients with reactions and 1 patient without reaction, with total prevalence of 6.9%. Helminth co-infections were not found to be associated with T1R (aOR =3.5; 95% CI 0.17, 73.15) nor T2R (aOR = 0.07; 95% CI <0.001, 80.49). The geospatial analysis found a RR of 6.80 (95% CI 1.46, 31.64) of finding new cases of leprosy in neighborhoods with schistosomiasis in one municipality. Incidence rates of leprosy per neighborhood increased with corresponding incidence rates of schistosomiasis. Conclusion: While the pilot study did not show a statistically significant association with helminth infections and reactions, the total numbers of co-infections were low. However, we found an association between leprosy and schistosomiasis on the spatial analysis, suggesting a possible role of co-infections propagating leprosy transmission. These findings call for further research with prospective studies on reactions as well as epidemiologic and immunologic studies on co-infections in areas with higher helminth endemicity.

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Acknowledgments

Thank you to my mentors and those who have guided me through my MPH including Uriel Kitron, Parminder Suchdev, and Juan Leon. I am grateful for their expertise and assistance and for connecting me to our colleagues in Brazil. I would like to thank my Brazilian collaborators, especially José Antonio Ferreira, for all his hard work and dedication to the study. I am also grateful for the expertise and guidance of Maria Aparecida de Faria Grossi and Sandra Lyon. D. Alexander Phillips assisted in the statistical analyses for the GIS study and I am grateful for his contributions. Lastly, I would like to thank the Brazilian medical students who volunteered their time on the study and to all the patients at the Hospital Eduardo de Menezes for generously donating their time and samples to make this project a reality.

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