Effects of helminth eradication on the immune system

Weisman, Z.[1], Mahdi, J.A.[2, 3, *], Kalinkovich, A.[1, 4], Stein, M.[4], Greenberg, Z.[4, 5], Borkow, G.[1], Adlerstein, D.[1, 2], Bentwich, Z.[1, 2]

[1]R. Ben-Ari Institute of Clinical Immunology, AIDS Center, Kaplan Medical Center, Rehovot, Israel, [2]Ben Gurion University of the Negev, Microbiology Immunology and Genetics, BeerSheva, Israel, [3]University of Gondar, Microbiology Immunology and Parasitology, Gondar, Ethiopia, [4]Hebrew University, Hadassah Medical School, Rehovot, Israel, [5]Public health laboratory, The Ministry of Health, Jerusalem, Israel

Abstract

Helminth infection has a profound effect on the immune system. However, the precise nature of the immune changes that are elicited by human helminth infection have not been sufficiently characterized. Furthermore, the reversibility of these changes after treatment has not been documented sufficiently. We observed immune profiles of Ethiopian immigrants to Israel cohort. A longitudinal follow up study involving different group of subjects were conducted. Each group had a baseline data for series of peripheral blood tests, including: IgE and Eosinophil levels, T-cell populations, T-cell receptors phenotypes, and cytokines measurement. These tests were all repeated at one year interval. Results were compared between newly-arrived-Ethiopian-Israelis (NEW-Eth-Il), Long-stayed-Ethiopian-Israelis (OLD-Eth-Il), and Non-immigrant- Israeli controls (NON-Imm-Il). Out of the 184 individuals 111 were NEW-Eth-Il, who had a high prevalence of helminth infection, the immunological changes were elivated IgE levels and eosinophil counts, decreased CD4/CD8 ratio, increased proportion of HLA-DR+CD3+, HLA-DR+CD4+ and HLA-DR+CD8+ cells, decreased proportion of CD45RA+CD4+ (naive) and CD28+CD8+ cells, increased proportion CD45RO+CD4+ (memory) cells, and increased secretion of IL-4 and IL-5 (Th2 type cytokines). In the OLD-Eth-Il, who were all negative for helminth infection, we did not observe these immune changes and did not differ markedly from that of the NON-Imm-Il controls. Significant normalizations in the above-mentioned variables were observed in 33 NEW-Eth-Ilwho had received successful treatment but not in those who missed the treatment. These findings demonstrate that helminth infection is associated with profound immune changes, and can be normalized within a short time after helminth eradication.

Keywords—*Ethiopia, Helminthiasis, Immune system, Treatment with anti-helminths.*

*Presenting Author: Jemal Ali Mahdi

Professional Biography

Jemal Ali Mahdi has completed his PhD from Ben Gurion University of the Negev, Israel. He has been working on "Immunological and Microbiome profiles of Intestinal helminthiasis and HIV-1 infection" and research projects related to microbiome and inflammasome in animal model and human studies, and in both natural and laboratory settings. In his earlier career, he had been working as health care provider, academic staff and researcher in University of Gondar, teaching hospital, College of Medicine and health Sciences, Department of Microbiology Immunology and Parasitology, Gondar, Ethiopia. He is now working in Ethiopian Public Health Institute (EPHI) in TB/HIV directorate in research supervisor position. He has published more than 20 papers in reputed journals and has been serving as a reviewer in medical journals.



Email Id: jemalizesh@gmail.com

Any Comments: