A Dual Role for Iron during Immune Response in Human leishmaniasis.

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Iron is an essential element for the cell; many studies show that disregulation of iron metabolism leads to deficient immune response against pathogens due to impairment in cytokine production. Symptomatic Leishmania infantum infection results in severe anemia, although part of the anemia could be associated with availability of nutrients in the diet. In order to evaluate the role of iron in Leishmania infection, cytokine profile (IFN-γ, TNF-α, IL-6, IL-10) was determined in response to Leishmania infantum antigen in a group of DTH+ blood donors. IFN-γ, TNF-α, IL-6 and IL-10 production was determined in lymphocytes and monocytes by flow cytometry. Cells supplemented with hemin (iron supplement) had a higher IFN-γ production in CD4 and CD8 T lymphocytes stimulated with antigen (P=0.0167 and 0.0232, respectively). Interestingly, desferroxamine (DFO; iron chelator) did not show increase in IFN-γ producing cells. However, in antigen stimulated monocytes, hemin did not elevate TNF-α, IL-6 or IL-10 production, although DFO did (P=0.035; 0.0275 and 0.0059, respectively). These data show that T lymphocytes did not produce IFN-γ in absence of iron. The absence of cytokine response in monocytes in presence of iron may be related to downstream IFN-γ signaling, which is strongly impaired by iron. STAT1 pathway could be impaired in such conditions. Taken together, these results suggest that iron plays different roles in immune cells. Understanding the impact of iron on immunity is critical for any approach against infectious diseases and may help us to look for better strategies for intervention in visceral leishmaniasis.

Key-words: Iron metabolism; Leishmaniasis; Cytokines.

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