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THE ROLE OF M1 AND M2 MACROPHAGES IN THE CONTROL OF AMERICAN CUTANEOUS LEISHMANIASIS

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Abstract

INTRODUCTION: The main causal agent of cutaneous leishmaniasis (CL) in Brazil is *L. braziliensis*. Macrophages (Mϕ) play a dual role in this infection and are classified into M1 and M2 types. M1 Mϕ can kill *Leishmania*, while M2 Mϕ are more permissive to infection and facilitate proliferation. AIMS: 1. To determine the frequency of M1 and M2 Mϕ in the peripheral blood of CL patients. 2. To assesss whether *L. braziliensis* predominantly infects M2 Mϕ derived from peripheral blood monocytes of CL patients. 3. To evaluate whether the frequency of M2 Mϕ from peripheral blood monocytes in CL patients is related to disease severity and treatment failure. METHODS: Monocytes from patients with CL (N=20) were obtained from peripheral blood mononuclear cells and incubated to develop into macrophages. The Mϕ were infected with *L. braziliensis* and characterized using surface markers: $CD86^{hi}$ and TNF for M1 Mϕ and $CD206^{hi}$ and IL-10 for M2 Mϕ, using confocal microscopy. We also evaluated the presence of parasites in M1 and M2 Mϕ. To correlate the frequency of these cells with disease severity and response to treatment, we evaluated whether the frequency of M2 Mϕ was related to ulcer size and failure to treatment with antimonial and disease duration. RESULTS: In patients with CL, M1 Mϕ predominate (70%) in the peripheral blood compared to M2 Mϕ (30%). M2 Mϕ show a significantly higher infection rate than M1 Mϕ ($p<0.005$). Additionally, healing time in patients with a predominance of M2 Mϕ was longer (115 days vs. 77 days) than in those with a predominance of M1 Mϕ, though the difference was not statistically significant. CONCLUSION: The study of M1 and M2 Mϕ in the peripheral blood of CL patients reflects findings observed in dermal Mϕ. M1 Mϕ are more frequent, while M2 Mϕ are more permissive to infection, and these differences may influence the response to CL treatment.

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