

elevated in CL patient group compared to values seen for the controls. This cytokine was increased during antimonial therapy in patient group. Several *in vitro* studies demonstrated that some herb powders, such as Echinacea, activate macrophage to produce TNF- α , IL- β , and IL-6 as well as oxidative burst and killing of *Leishmania* parasite⁽²⁵⁾.

IL-8 is a chemokine produced by macrophages and other cell types such as epithelial cells and endothelial cells. It is a proinflammatory cytokines that chemoattract and activates blood cells, beside its central role in inflammation; other biological functions of IL-8 include T cell chemotaxis, angiogenesis, and hematopoiesis^(26,27). IL-8 concentrations were significantly higher ($p < 0.05$) in CL patients before treatment (32.22 ± 2.16) than in the control subjects (16.38 ± 1.61) and this increment was still significantly higher during treatment (333.6 ± 69.97). Lejon et al.⁽²⁸⁾ detected a significant elevation of IL-6 and IL-8 levels in patients of the late stage *Trypanosoma gambiense*. TNF- α stimulate release of IL-8 which may in turn play an important role in the inflammation reaction. The chemokines IL-8 essential to bring the more neutrophils at the site of infection, also other proinflammatory cytokines might induce production of IL-8 to a reactive oxygen species, which caused a direct intracellular killing to *Leishmania* parasite during treatment with antimonial salts^(8,29).

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