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Estrogen treatment of PCOS women may provide protection against *Leishmania* infection by stimulating human macrophage functions

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Background & Aim: Obesity has been recognized as a common feature of the polycystic ovary syndrome (PCOS). Obese women with polycystic ovary syndrome (PCOS) have increased estrogen levels. Obesity, in turn, can impair the development of protective anti-*Leishmania* immunity. Macrophages, the primary resident cell for *Leishmania* possess estrogen receptors and play critical roles in the initiation, development, and maintenance of a protective immunity. One question that needs to be examined is whether the change in estrogen levels can influence *leishmaniasis* outcome. To explore this question, we investigated the effect of a range of physiological 17 β -estradiol (E2) levels on the reinforcement of macrophage functions involved in host defense against *L. tropica* infection.

Methods: Parasite killing by human monocyte-derived macrophages was microscopically evaluated by Giemsa dye. Nitric oxide release was measured by Griess reaction for nitrites. Whereas, cytokines release were evaluated by Enzyme-Linked Immunosorbent Assay (ELISA).

Results: Our results demonstrated that treatment of human macrophages for 5 min with increasing concentrations of E2 (10–2000 nM) prior to *L. tropica* infection significantly increased no production and this was correlated with decreasing in the percentage of infected cells, as well as the parasite burden per cell. This hormone has also an immunomodulatory effect on macrophages by increasing IL-6 and IL-12 (p40) secretion, typically associated with classical macrophage microbicidal activity and driving to the generation of a Th1 response characteristic of the resistance phenotype. These effects of estrogen were noticed to be a dose-dependent manner and the greatest effect was in the dose 1000 nM E2. In contrast, treatment with all E2 concentrations tested did not produce any significant response in IL-10 levels, which is known to inhibit the secretion of pro-inflammatory cytokines leading to Th2 responses.

Conclusions: The results demonstrate that physiological levels of E2 exhibit a protective effect against *Leishmania* infection which suggest that estrogen might be exploited as a target for new drugs against *leishmaniasis*. Moreover, dosage, duration, the type of estrogen and route of administration all merit consideration when determining the outcome of *leishmaniasis*.

Biography

Souad Mahmoud Alokla has completed his PhD in Immunology from Faculty of Pharmacy, University of Strasbourg II in France. He taught Graduate and Post-graduate courses in Biology, Immunology, Genetics and Medical Genetics in different faculties (Sciences, Medicine, Pharmacy, Dentistry and Agriculture) at Damascus University, Arab International University and Al-Kalamoon University. In addition, he supervised many Master's students (10 Finished thesis and others in progress) and PhD (one finished thesis) degree students. He has published 28 papers till date. Furthermore, he was the Head of IVF Lab in IVF and Sterility Unit in Obstetrics & Gynaecology Hospital in Syria. Currently, he is serving as Associate Professor at Oman Medical College in Oman; teaching Molecular Biology, Cell Biology & Immunology courses and doing research in these fields.

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