

## Physiological Assessment of Sex Hormones in Infected Women with Cutaneous Leishmania

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### ABSTRACT

The results of the clinical and laboratory examination showed 60 samples of women with cutaneous leishmaniasis in Salah Al-Din Governorate for the period from January to March 2022, during this research, the effect of skin leishmaniasis infection on the level of sex hormones (LH, Estrogen, Testosterone, FSH) was known, where the results were an increase in the level of LH, Estrogen, Testosterone, while the level of FSH hormone decreased in females compared to the control group.

**Keywords-** sex hormones, cutaneous leishmania.

### I. INTRODUCTION

Leishmaniasis is a tropical and subtropical disease caused by the parasite *Leishmania* (Kinetoplastida trypanosomatid ae) that can be found in 97 countries and about 350 million people have been affected by this infection. It is transmitted through the bite of a female sand fly genus *Pliebotomine*, classified into cutaneous leishmaniasis CL, mucocutaneous leishmaniasis MCL, and visceral leishmaniasis CL, depending on its symptom of infection. The disease mostly affects developing countries such as India, Bangladesh, and Nepal, according to a 2014 World Health Organization report. The *Leishmania* parasite lives inside the macrophage of the vertebral host in the form of Amastigote and flagellum Promastigote in the intestine of the sand fly insect.

*Leishmania* is transmitted through the sting of a sand fly infected with leishmania parasites, as about 30 species of sand fly insect are infected when it takes its meal of blood from hosts infected with parasites such as humans or storage hosts such as rodents and pets such as dogs, goats, cats, and camels.

### II. MATERIAL AND METHOD

The present study was done at Dept. / collage of /Tikrit University. Samples were collected from patients in a private clinic in Salah al-Din governorate, where 90 blood samples were collected from women, 60 blood samples from infected women with cutaneous leishmaniasis, and the control 30 blood samples healthy women.

Ninety women participated in the study, 60 infected women with cutaneous leishmaniasis (infected group) in the Salah al-Din governorate and 30 healthy women (control group).

### III. ETHICAL APPROVAL

Informed consent was obtained from each patient to participate in the current study, and the Central Research Ethics Committee at Tikrit University approved this research.

#### IV. INCLUSION CRITERIA

Patients with cutaneous leishmaniasis before the lesion healing and patients who agreed to participate in this study were included.

#### V. EXCLUSION CRITERIA

Cases that have reached the stage of recovery and patients who did not agree to be examined.

#### VI. SAMPLES

5 ml of patients' blood was collected and placed in a gel tube and then separated by a centrifuge at a speed of 2500 rpm for 10 minutes then the serum was taken by an automatic pipette and placed in the tubes of Abendrouf and coated well to prevent contamination and kept at a temperature of -20 and then the samples were brought to room temperature before the tests.

##### *Evaluation of the level of hormone FSH, LH, ES, S, TEST*

The level of hormones FSH, LH, ES, and Test was estimated by following the steps attached in its ready-made Kit and according to the manufacturer's instructions for the Monobind device. ELISA.

#### VII. RESULTS

Table (1) revealed that all hormones are significantly increased except FSH was significantly

decreased in the infected group when compared with a control group. The studies revealed the relationship of sex hormones with cutaneous leishmaniasis is very rare, on the other hand, little in several studies have been conducted on the relationship between sex hormones with visceral leishmaniasis, such as Verde (2011), showed the normal level of FSH hormone and an elevated LH and a decrease in Testosterone in patients with visceral leishmaniasis, in ages of the patients were close to the ages of the patients of the current study (16-32) years of infection group.

##### *Liver dysfunction is characteristic of low total hormone levels:*

The elevation in hormones level may be due to the presence of cytokines as a result of the occurrence of infection that affects the central nervous system, which in turn induced endocrine glands to increase the secretion of sex hormones. The cutaneous leishmania parasite affects on hormones level of the host through its effect on the endocrine gland and this is varying from one host to another depending on genetic and behavioral differences and variations in the immune response against parasitic infection, which may lead to an increase in the production of sex hormones that reduce the activity of natural killer cells and decreased in production of phagocytes and affect on the production of TNF- $\alpha$  and NO cytokines which promote the production of cytokines which act as an anti-inflammatory mediator.

**Table 1: Sex hormone levels in infected women with cutaneous leishmaniasis in Salah al-Din Governorate**

Estrogen (pg/ml)	Testosterone (ng/ml)	FSH (mIU/ml)	LH mIU/ml	Variants groups
137.0 $\pm$ 39.9	70.7 $\pm$ 18.6	2372 $\pm$ 96.40	0.1190 $\pm$ 0.1410	Infected group
111.8 $\pm$ 29.7	61.9 $\pm$ 12.2	2624 $\pm$ 135.0	0.0484 $\pm$ 0.0783	Control group
0.050*	0.051*	0.054*	0.042*	P.value

#### VIII. CONCLUSIONS

The obtained results in the current study were reveal:

1. Significant increase in all hormones except FSH, which decreased in the infected women.
2. According to age
3. By village and city.
4. According to educational level, employee and housewife.

#### RECOMMENDATION

1. Study each hormone independently in women with leishmaniasis and according to different age groups and demographic factors
2. Study the same study on a large Iraqi community.

3. Study the molecular and genetic studies to predispose to infection with this parasite in specific human breeds

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