

## Assessment of Serum Luteinizing hormone, Follicle-stimulating hormone and Testosterone Level among some Sudanese Marijuana abuse People

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**Abstract:** Marijuana affects a variety of hormones that are regulated by hypothalamic function and it appears that the psychoactive ingredient, THC, is the major compound responsible for this action. To assess of LH, FSH, and Testosterone level in marijuana abuse. This case control study includes 60 marijuana abuses from Elribat hospital as case study. These patients are compared with age and sex matched with 60 healthy subjects as controls. All volunteers age ranging between 18-60 years. Blood samples were collected from all subjects, then serum concentration of LH, FSH, and testosterone were estimated using ELISA Bio TeK. There were a significant decrease in the level of LH, FSH and testosterone in marijuana abuse in comparison with a control group where the (mean  $\pm$  SD) of LH, FSH, and Testosterone in marijuana abuse people were (4.9 $\pm$ 1.9, 3.3 $\pm$ 1.9, 19.3  $\pm$  6.1) respectively while the (mean  $\pm$  SD) of control group were (5.9 $\pm$ 3.62, 6.9 $\pm$ 3.6, 22.5 $\pm$ 9.5) for LH, FSH, & Testosterone respectively. This study concluded that (LH, FSH and Testosterone) level were highly significant decreased in marijuana abuse.

**Keywords:** Marijuana, Abuse, Luteinizing hormone (LH), Follicle-stimulating hormone (FSH), Testosterone, Sudanese

### INTRODUCTION

The dramatic increase in the casual use of marijuana raised cannabis (hashish, marijuana) is obtained from the flowering tope of hemp plants. It's a psychoactive substance that usually is smoked. Its principle psychoactive ingredient is  $\Delta^9$  - tetrahydrocannabinol (THC). Cannabinoids are a group of psychoactive compounds found in marijuana cannabis is the most commonly consumed illegal drugs and self reported consumption has continued to grow through 1990 [2]. THC is the most potent and abundant. Marijuana its processed product Hashish can be smoked or ingested [4]. Effect of chronic use have not been will establish [4]. THC is a lipophilic substance which is rapidly removed from circulation by passive distribution into hydrophobic compartment, this result in slow elimination as result of redistribution back into circulation of subsequent hepatic metabolism [4] Hepatic metabolism of THC produces several products that are primarily eliminated urine [4]. Marijuana usage in the form of cigarettes made from dried leaves, flowers and stalks of females' cannabis sativa plants [5]. Alterations in endocrine function in conjunction with marijuana use have caused considerable concern. researchers efforts in many investigation in the recent past have made it abundantly clear that exposure to marijuana had significant effects upon the reproductive system on both male and female, altered testicular function and depressed hormonal secretion [1], LH and

FSH, secreted by pituitary in the male. The tetra hydro cannabinol induced blockage of gonado tropins release and results in lowered LH and FSH which are responsible for a reduced testosterone production by the leyding cells of the testes [1]. Acute and chronic marijuana smoking resulted in decreased plasma testosterone and LH concentration and large doses produced oilgospermia with decreased FSH [3]. Obvious changes detected in liver function and hematological indices were observed to be abolished after long term C. sativa usage in addict men [6,7]. In general marijuana is the first drug to be used subsequently, other drugs with stranger may substitute for it or other legal or illicit drugs may start to be taken in association with its adverse effect of chronic marihuana usages have been described upon the respiratory [8,9]. And cardiovascular system [10]. Questions remain regarding its effect upon reproductive system [11]. And cellular and humeral immune systems [12]. Cannabis smoke is mutagenic, in vitro and in vivo thus also suggesting carcinogenicity [13]. Chronic intensive use of marijuana may produce alteration in male reproductive physiology through central hypothalamus or pituitary action [14].Cannabinoid administration actually alters multiple hormonal systems, including the suppression of the gonadal steroids, growth hormone, prolactin, and thyroid hormone and the activation of the hypothalamic – pituitary – adrenal axis [15].

**MATERIALS AND METHODS**

This study was conducted at Elribat hospital, Khartoum, from May to August 2015; Samples were collected from Sudanese prisoners of alhuda prison.

**Study population**

This case control study includes; 120 males (60 marijuana abuses as case study & 60 apparently healthy males as controls) their age ranging between 18-60 years.

**Sampling**

5ml of venous blood was collected under a septic precaution in a sterile plain container from selected subjects. Then serum was separated by making a centrifugation for all samples by digital centrifuge 1500 rpm for 2 min. Then concentration of LH, FSH and Testosterone were estimated using ELISA Bio TeK.

**Inclusion criteria**

Marijuana abuse people as study group, normal healthy subject as control group.

**Exclusion criteria**

Testicular-cancer, genetic disorder (turner syndrome, Kline felter syndrome) Exposure to radiation, pituitary disorders injury to the pituitary or hypothalamus – brain surgery – Kallmann syndrome.

**Statistical analysis**

The data obtained in our study was analyzed for its statistical significance using statistical package for social science (SPSS) software; evaluation of patient’s data was performed using the t-test results .P-value less than 0.05 was considered the level of significance.

**RESULTS**

**Table-1: the (mean± SD) of male hormone in the study**

parameters	Mean±SD	Mean ±SD	p-value
	Case No. 60	Control No. 60	
<b>Testosterone (ng/ml)</b>	19.3±6.1***	22.5±9.5***	0.000
<b>FSH(mIU/ml)</b>	3.3±1.9***	6.9±3.6***	0.000
<b>LH(mIU/ml)</b>	4.9±1.9***	5.9±3.6***	0.000

\*\*\*Serum Testosterone, LH and FSH were highly significant decreased

**DISCUSSION**

In the present study, the effect of marijuana on the level of the sex hormone (LH, FSH and testosterone) was tested in 60 cannabis abuses male from alhuda prison and the values were compared to the level of 60 non users control. Result of LH, FSH and Testosterone levels in marijuana abuse showed

significant decrease (4.9±1.9, 3.3±1.9, 19.3 ± 6.1) respectively, p.value was (0.000) when compared with control. This results agree with the previous study<sup>(1)</sup> who stated that in response to drug metabolic stress cannabinoids transiently depress pituitary function as reflected by decrement in LH and FSH hormones, also our finding agree with [16] they found that intra peritoneal injection of cannabis extract at low doses induced adverse effect on testes ,histology finding revealed significant shrinkage of tubular diameter and detrimental change in seminiferous epithelium of testes with resulting lowered serum testosterone and pituitary gonadotropins (FSH,LH) levels . It is probable that THC affects these hormones through its ability to alter various neural transmitters in the hypothalamus or neural transmitters in the CNS which impinge on the hypothalamus. The dopaminergic and serotonergic fibers seem to be particularly important. The two gonadotropins, LH and FSH, secreted by the pituitary gland are of major importance to reproduction in the male. Both gonadotropins appear to respond to a single releasing factor from the hypothalamus, GnRH, which is sensitive to catecholamine neurotransmitters. The THC-induced block of GnRH release results in lowered LH and FSH which is responsible for reduced testosterone production by the Leydig cells of the testis.

**CONCLUSION**

This study concluded that serum hormone LH, FSH and Testosterone were significantly decreased in marijuana abuse.

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