

## **Effect of GSM(Towers and Mobil radiation) on reproductive hormones in males**

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**Abstract :** Today, cell phone technology is an integral part of everyday life and, its use to chat including voice and picture in addition to many other applications. Male reproductive system is highly compartmentalized and sensitive biological system that requires the integration of intrinsic and extrinsic factors to normal function, hence we studied effects of GSM (Towers and Mobil radiation) on reproductive hormones (FSH,AMH,LH, Testosterone) and interference of other factors such as smoking ,distant and hours near towers, Mobil using period, and tumors related with .Our study applied on (144) sample compared with (50) control, the result showed significant increase in LH&FSH levels while significant decrease in Testosterone & AMH hormone, also significant increase in hormone levels smoking and non-smoking persons and distend from tower.

**Keywords :** GSM , reproductive hormone, mobile.

### **Introduction:**

In recent year it was observed that most growing efforts are concentrated on the human health effect, by exposure to electromagnetic waves emitted by wireless communication devices such as mobile and towers<sup>1</sup>.

While the number of mobile phone service subscribe are estimated to be more than (5) billion all over the world. accordingly 31 scientists and 14 countries had been met in the International Agency for Research on Cancer (IARC) 2011 in Lyon, France, to evaluate and assess the risk of disease cancer due to exposure, that published in volume No.(102) of the agency .

(IARC) belongs to world health organization (WHO) classified radio waves of the electromagnetic field as a potential factor for cancer for human, which was adopted to increase the risk of Glioma (a type of brain malignant associated with the use of mobile phones).

Researchers discussed the possibility of negative effects on human health as a result of prolonged exposure to these waves, Gonadotropins (FSH, LH) and testosterone and AMH are the prime regulators of germ cell development. Abnormal spermatogenesis is often associated with altered serum gonadotropins and testosterone. A number of recent reports have suggested a possible link between cell phone use and male infertility<sup>2</sup>. The concern has arisen that carrying a cellular phone near the reproductive organs such as the testes may cause dysfunction and particularly a decrease in sperm development and production, and thus decrease fertility in men.

Keeping the cell phone in areas close to gonads in active mode will negatively affect spermatozoa and impair male human fertility needs to be determined. Additionally, it needs to be determined whether men of reproductive age who engage in high levels of mobile phone use should not keep their phones in receiving mode below waist level.<sup>3</sup>

Human caused by these waves ,it recommended the need for continuous researches and monitoring to determine the relationship between the mobile phone and the growing risk of cancer and infertility problems.

According to this study intended investigate the effect of electromagnetic waves emitted from mobile communication and towers on human health and the overall reproductive hormones in men as complementary series of the international research works in our area .

## Materials and methods:

Blood samples are collected ( 7ml) from 144 male persons how exposed to electromagnetic waves from mobiles and communication towers ,then compared with (50) healthy people ( control sample ) ,after measuring hormone level of FSH,LH,AMH and testosterone .the research used an application prepared for this purpose to get information about marital status ,smoking, distance of the tower ,mobile using period and number of towers.

Serum concentrations of FSH, LH were measured using ELISA The ELIZA kit that was used .The level of serum testosterone was measured using enzyme-linked immunosorbent assay (ELIZA) method The ELIZA kit that was used was manufactured by Bio-Check, Inc. Company (USA) Serum AMH concentrations were measured using AMH/MIS enzyme linked immunosorbant assay kit (Immunetest material USA).

## Results and discussion:

The results of the current study showed (table 1) significant increase ( $p<0.05$ ) ( $p<0.01$ ) in level of LH,FSH hormone respectively compared with control while AMH,Testosteron hormones level decreased significantly ( $p<0.05$ ) .it is known that there is an inverse relationship between LH,FSH, AMH and testosterone where the high level of first hormone led to reduce level of second ones.Testosteron is one of the important hormone that has close relationship with fertility in men<sup>4</sup>. The study by<sup>5</sup> showed the effect of mobile phone use and the frequency of radiation released from on the male reproductive system through its impact on the movement of sperm,shape ,census and function of sperm as well as reduced levels of AMH,Testosteron.

**Table (1) reproductive hormone level in male exposure to communication tower radiation**

sample	FSH	LH	Testosterone	AMH
control	2.39 $\pm$ 0.21	4.00 $\pm$ 0.24	9.79 $\pm$ 0.42	6.45 $\pm$ 0.33
Experiment	12.93* $\pm$ 0.28	10.61** $\pm$ 4.00	3.12* $\pm$ 0.09	1.45* $\pm$ 0.04

Mean  $\pm$ SE

In the studies carried out by the Indian council of medical Research (ICMR) on communication tower effect on organisms in India,including the study carried out by<sup>6</sup>,concluded that electromagnetic field working to effect on the function of androgens which are regarded as a primary nutation for maturation of sperm ,and for this reason these rays considered as an affecting factor on male fertility .

**Table (2) reproductive hormone level in male according to smoking, distance from tower and Social status**

Hormone level	Smoking		Distance from tower		Social status	
	smoker	Non-smoker	near	far	married	Single
FSH	10.03* $\pm$ 0.22	6.41 $\pm$ 0.09	11.01** $\pm$ 0.06	7.12 $\pm$ 0.71	8.34 $\pm$ 0.40	4.51 $\pm$ 0.02
LH	11.05* $\pm$ 0.03	4.21 $\pm$ 0.12	8.54 $\pm$ 0.11	3.51 $\pm$ 0.35	12.31 $\pm$ 0.30	6.21 $\pm$ 0.32
Testosterone	4.61** $\pm$ 0.13	5.33 $\pm$ 0.04	5.21** $\pm$ 0.29	7.31 $\pm$ 0.35	4.72* $\pm$ 0.06	5.31* $\pm$ 0.41
AMH	2.41** $\pm$ 0.21	6.23 $\pm$ 0.47	3.12** $\pm$ 0.71	7.53 $\pm$ 1.4	3.44 $\pm$ 0.08	6.41 $\pm$ 0.11

Mean  $\pm$ SE

The current study showed (table 2) significantly increase in LH,FSH levels (  $p<0.05$ ) respectively in smokers than non-smokers ,and significantly decreased in AMH,Testosteron level (  $p<0.01$ ) among relative to non-smokers .cigarettes smoke effect the somatic cells and may be mtefra factor ,and this is a result of present of toxic materials such as nicotine ,unilateral ,dioxide and cadmium that inhale through cigarette smoking that interferes with effect from exposure to radiation from communication towers ,and a result in a decline in fertility hormone levels in males ,as well as the occurrence of sperm abnormalities<sup>7</sup>.

The significant elevation (  $p<0.01$ ) in FSH levels, with significant decreasing (  $p<0.01$ ) in AMH levels, Testosterone in people near to communication towers,while significant increase in LH hormone levels that agree with<sup>8</sup> .whom worked on measuring of electromagnetic radiation in the vicinity of the towers these were closed to the schools ,hospitals ,housing and compered with the levels that human and animal affected by the results showed that the level of exposure id highs than the allowable limit and the effect will by greater as the distance become closer.Also the carried study showedsignificant decrease (  $p<0.01$ ) in testosterone levels among married couples compared to non-married couple ,while results were non-significant for AMH,FSH,LH respectively and this is consistent with the studies done by<sup>9-12</sup>

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