

The Effects of Mobile Phone Radiation on Serum Levels of Progesterone In Female Rats

Razavinia A *, Ahmadi R, and Gohari A

Abstract—Studies show that there is association between environmental factors and female reproductive system function . The main aim of this study was to determine the effects of mobile phone radiation on serum levels of progesterone in female rats. In our study female Wistar rats were randomly divided into control and mobile phone radiation receiving groups for 1, 3 and 6h/day of 5 rats in each group. After 8 weeks, blood samples were obtained and serum level of progesterone was measured using radioimmunoassay method. Data were statistically analyzed and compared between groups using ANOVA. The results indicated that serum level of progesterone was increased in rats exposed to mobile phone radiation for 3h/day compared to control rats ($P<0.05$). Our findings show that mobile phone radiation have a significant role in increasing of progesterone level, so long term exposure to mobile phone radiation can bring about serious health problems in females.

Keywords— Mobile Phone Radiation, Memory, Male Rat.

I. INTRODUCTION

WITH the development of the mobile communication industry, there are considerable public concerns about the relationship between mobile phone radiations and human health. With regard to electromagnetic field emitted by mobile phone may influence tumor, learning and memory, subjective symptoms and blood-brain barrier [1]. The spectrum of electromagnetic waves is very wide, but microwave frequency and wave length range from 300 MHz to 300 GHz and 1 mm to 1 m respectively [2]-[3]. Microwave spectrum is used in mobile phones and mean frequency they emit is about 900 MHz to 1 GHz [4].

Electromagnetic waves can affect on biological systems. And cellphone is a one of the source which can emit waves . Today the electromagnetic waves are present in all environments [5],[6]. The reports indicate that specified electromagnetic waves of mobile phone influence body leading to disorders including various cancers and other diseases [7],[8]. There are also studies showing that cell phone radiation

Abazar Razavinia (*corresponding author) is with Department of Biology, Faculty of Basic Sciences, Islamic Azad University of Tehran Medical Branch, Tehran, Iran (email: red_strom_77@yahoo.com).

Rahim Ahmadi(PhD) is with Department of Physiology, Faculty of Basic Sciences, Islamic Azad University, Hamedan Branch, Hamedan, Iran. (email: Rahahmadi2001@yahoo.com).

Azam Gohari (MSc student) is with Department of Physiology, Faculty of Basic Sciences, Islamic Azad University, Hamedan Branch, Hamedan, Iran. (email: Azam_gohari@yahoo.com).

can affect on endocrine system bringing about changes in serum levels of various hormones [9],[10]. However, as whole, there are conflicting evidences on the effects of mobile phone radiation on body systems [11]. For To clarify the effects of mobile phone radiation on female reproductive system we carried out this study to determine the effects of mobile phone radiation on serum levels of progesterone in female rats.

II. MATERIAL AND METHODS

A. Animals

Adult Wistar rats weighting 200 ± 30 g were purchased and raised in our colony from an original stock of Pasteur institute (Tehran, Iran).The temperature was at 23 ± 2 °C and animals kept under a schedule of 12h light:12h darkness (light on at: 08: 00 a.m.) with free access to water and standard laboratory chow. This study was performed according to ethical guidelines relating to working with laboratory animals [8].

B. Protocol of Study

Female Wistar rats were randomly divided into control and mobile phone radiation receiving groups for 1, 3 and 6h/day of 5 rats in each group. After 8 weeks, blood samples were obtained and serum level of progesterone was measured using radioimmunoassay method.

D. Statistical Analysis

All values are presented as mean \pm S.E.M. Statistical significance was evaluated by one-way analysis of variance (ANOVA) using SPSS 19. Differences with $P<0.05$ were considered significant.

III. RESULTS

Table I and Figure I show the serum levels of progesterone in female rats. The results indicated that serum level of progesterone was increased in rats exposed to mobile phone radiation for 3h/day compared to control rats ($P<0.05$).

TABLE I
SERUM LEVEL OF PROGESTERONE IN CONTROL ANIMALS AND RATS EXPOSED TO MOBILE PHONE RADIATION FOR 1, 3 AND 6H/DAY. P VALUES ARE VERSUS CONTROL GROUP. NS INDICATES NON-SIGNIFICANT DIFFERENCE COMPARED TO CONTROL GROUP.

Group	Progesterone (ng/dl)	P
Control	0.92 ± 0.30	-
1h/day	0.54 ± 0.17	NS
3h/day	1.56 ± 0.39	NS
6h/day	2.90 ± 0.75	<0.05

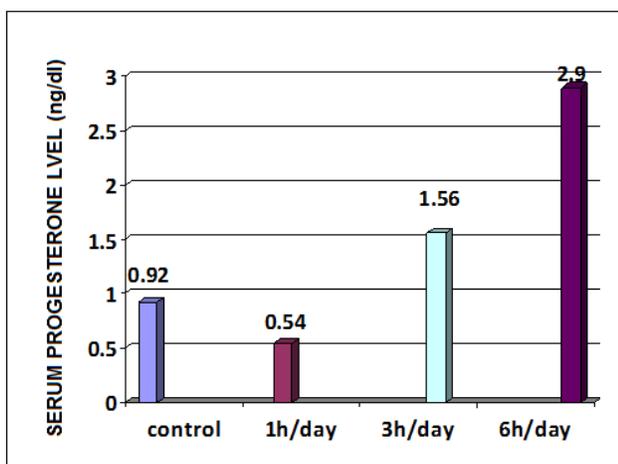


Fig. 1 Serum level of progesterone in control animals and rats exposed to mobile phone radiation for 1, 3 and 6h/day.

IV. DISCUSSION

The results of our study indicated that long term exposure to mobile phone radiation increases serum progesterone level in female rats. In line with our finding there are other studies showing that exposure to cell phone radiation threaten many aspects of human health [1]. The studies show that cell phone radiation may seriously influence our endocrine system [9], [10]. There is also evidence showing that cell phone radiation causes changes in serum levels of sex hormones [9].

Despite studies reporting the harmful effects of cell phone radiation on health [1], including our finding, some studies suggest no significant influence of mobile phone radiation on our body systems functions such as heart rate and blood pressure in subjects exposed to cell phone waves [12],[13]. However, it is expected that radiation emitted from a cell phone can reach all parts of the body and penetrate into the living tissues, and influence the body at the cellular level, leading to changes in glands structure and function resulting in changes in serum levels of hormones including sex steroid hormones.

V. CONCLUSION

We have shown that exposure to mobile waves can bring about increased progesterone level, according to which, it is pivotal to avoid long term exposure to mobile waves to maintain good health.

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Abazar Razavinia (Corresponding author) received his BS degree in Islamic azad university Qom branch and at present he is MSc student in Faculty of Basic Science, Islamic Azad University of Tehran Medical Branch, Tehran, Iran