

Cell phone usage and erectile function

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Article history

Submitted: Jan. 2, 2013

Accepted: Jan. 15, 2013

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Introduction. The objective of this pilot study was to report our experience concerning the effects of cell phone usage on erectile function (EF) in men.

Material and Methods. We recruited 20 consecutive men complaining of erectile dysfunction (ED) for at least six months (Group A), and another group of 10 healthy men with no complaints of ED (Group B). Anamnesis, basic laboratory investigations, and clinical examinations were performed. All men completed the German version of the Sexual Health Inventory for Men (SHIM) for evaluation of the International Index of Erectile Function (IIEF), as well as another questionnaire designed by our clinicians that assessed cell phone usage habits.

Results. There was no significant difference between both groups regarding age, weight, height, and total testosterone (Table 1). The SHIM scores of Group A were significantly lower than that of Group B, 11.2 ± 5 and 24.2 ± 2.3 , respectively. Total time spent talking on the cell phone per week was not significantly higher in Group A over B, 17.6 ± 11.1 vs. 12.5 ± 7 hours. Men with ED were found to carry their 'switched on' cell phones for a significantly longer time than those without ED, 4.4 ± 3.6 vs. 1.8 ± 1 hours per day.

Conclusions. We found a potential correlation with cell phone usage and a negative impact on EF. Further large-scale studies confirming our initial data and exploring the mechanisms involved in this phenomenon are recommended.

Key Words: testosterone ◊ erectile dysfunction

INTRODUCTION

The number of global mobile phone subscriptions is estimated at five billion [1]. Cell phones operate using a wide range of frequency bands (4002000 MHz) that emit radiofrequency electromagnetic waves (EMW). Recently, a significant number of studies reported on the potential harmful effects of cell phone usage [2–5]. Moreover, in 2011, a WHO-related committee classified radiation emitted from cell phone as grade 2B carcinogenic, which could indicate possible carcinogenicity to humans [6].

The link between cell phone usage and men's health hazards was proven in a number of studies that focused on the male reproductive health. The potential that the adverse effects of cell phone technology may have on male fertility were subjects of extensive investigations over the past three years with many researchers reporting significant adverse effects of men's semen parameters, including motil-

ity and morphology [7–11]. Other animal studies demonstrated that EMW may have a broad range of damaging effects on the male reproductive functions through both thermal and non-thermal effects [12]. Erectile dysfunction (ED), the inability to attain or maintain a penile erection sufficient for successful sexual intercourse, is a very common clinical condition that can affect up to 50% of men over 40 years old [13]. Among the risk factors for ED are diabetes mellitus, hypertension, obesity, and hypercholesterolemia [14]. The objective of the present pilot study was to report our experience concerning the effects of cell phone usage on erectile function (EF).

METHODS

This study was approved by the Institutional Review Board, and informed consent was obtained from all patients. We recruited 20 consecutive men complaining of ED for at least six months (Group A). Group B

included another 10 healthy men with no complaint of ED. Clinical histories, basic laboratory investigations, and clinical examinations were performed. All men completed the German version of the Sexual Health Inventory for Men (SHIM) for evaluation of the International Index of Erectile Function (IIEF), as well as another questionnaire designed by our clinicians that assessed cell phone usage habits (Appendix I). Differences between the 2 groups were considered significant if the significance level (p) was less than 0.05.

Appendix I

Cell phone history:

- How many hours a week do you talk over the cell phone?
- How many hours per day do you hold the cell phone in standby position?
- Do you daily use other devices that emit radio-waves like blue tooth or laptops? yes or no.
- Does your work expose you to radio-waves or irradiation of any kind? If yes, details?

RESULTS

There was no significant difference between both groups regarding age, weight, height, smoking, and total testosterone (Table 1), and there was no significant difference between both groups regarding exposure to other known sources of radiation (Table 1). The IIEF scores of group A were significantly lower than that of group B, 11.2 ± 5 and 24.2 ± 2.3 , respectively. Total time spent talking on the cell phone per week was not significantly higher in group A over B, 17.6 ± 11.1 versus 12.5 ± 7 hours. Men with ED carried their switched on cell phones for a significantly longer time than men with no ED, 4.4 ± 3.6 vs. 1.8 ± 1 hours per day (Fig. 1). There were no significant differences between both groups concerning non-cell phone radiation exposure (Table 1).

DISCUSSION

Hundreds of millions of men around the globe use a cell phone on daily basis. This extensive and regular exposure to EMW carries many potential health hazards that were investigated in the medical literature. However, there was no strong evidence to prove the detrimental effects of cell phone usage. Nevertheless, caution should be taken when using such devices.

We had previously reported in a large study on male infertility that cell phone usage may negatively impact semen parameters in men [15]. That study confirmed earlier reports suggesting an increased potential for harmful effects on male fertility due to cell phone usage [8, 9, 10]. Davoudi et al. [16] found that using GSM phones for 6 h/day for five days decreased the rapid progressive motility of human sperms. Our

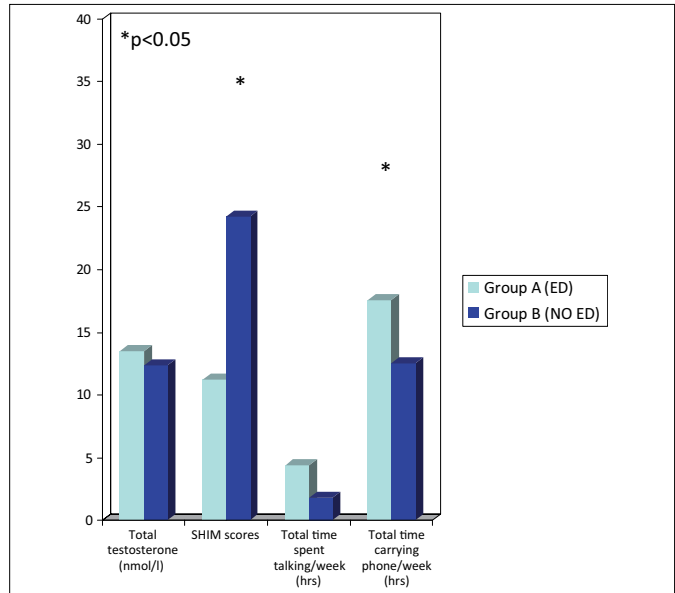


Figure 1. Mean SHM scores, cell phone usage habits and total testosterone levels of all patients.

group showed reduction in the semen quality of men using cell phones; including sperm motility and morphology. We concluded that, "It seems that exposure to EMW through cell phones does not affect the total sperm count, which may indicate that certain testicular functions are still preserved" [15].

This prospective pilot study showed that there may be a relation between cell phone usage and ED, which is indicated by the following results of this study: men with ED use their cell phones longer than men without ED, men who have ED carry their switched on cell phones significantly longer than men who do not have ED, and the effect of cell phone usage on total testosterone levels is not significant.

Our study showed the total time of exposure to the EMW of the cell phone is much more important than the relatively short duration of intense exposure during making cellular phone calls.

Table 1. Characteristics of Study group subjects (Groups A and B) Mean \pm (Standard deviation)

	Group A (n = 20)	Group B (n = 10)
Age (years)	48.6 \pm 12.1	50.1 \pm 12.2
Weight (kg)	82.8 \pm 12.7	79.2 \pm 14
Height (cm)	178.1 \pm 8.6	181.3 \pm 7.8
TT (nmol/l)	14.1 \pm 1.9	13.7 \pm 2.5
Smoking (%)	5/20, 25%	3/10, 30%
Exposure to other sources of radiation (blue tooth, laptops) (%)	6/20, 33%	4/10, 40%

(TT=total testosterone)

In our previous study we reported that serum total testosterone levels may be impaired in men with infertility and in those using cell phones [15]. However, in the current study we could not find the same link, which may be due to the small sample size of patients and healthy controls included.

Our results are preliminary and have several limitations. One limitation is a small number of patients

and, therefore, larger studies are needed to confirm our initial report.

CONCLUSION

There may be a relation between cell phone usage and erectile function. Further larger studies are recommended to confirm our findings.

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