Cell Phone Use Causes Decline in Semen Quality

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Worldwide more than 700 million cell phones are in use and the number is expected to increase to 1.6 billion very soon. The question of whether mobile phone radiation causes any adverse effects on fertilization potential of males has raised a significant public concern. Sufficient studies have been published documenting the effects of electromagnetic waves on blood pressure, melatonin, concentration, sleep and headaches to validate the question of their potential effects on semen quality.

An observational study recently completed by researchers in the Cleveland Clinic's Reproductive Research Center, the Glickman Urological and Kidney Institute and the Department of Obstetrics-Gynecology is the first to demonstrate that cell phone usage has adverse effects on multiple semen parameters. Results were presented at the fall 2006 meeting of the American Society for Reproductive Medicine in New Orleans.

Researchers stratified 361 men attending an infertility clinic intro four cell phone usage groups: no use (Group A, n=40), < 2 hr/day (Group B, n=107), 2 to 4 hr/day (Group C, n=100) and >4 hr/day (Group D, n=114). Semen analysis was performed to evaluate sperm for volume, liquefaction time, pH, viscosity, sperm count, motility, viability and percentage normal morphology.

Four sperm parameters – sperm count, motility, viability and percent of normal morphology differed significantly among the cell phone use groups. We found a strong correlation between reduction in these parameters and the highest rates of cell phone use.

Key Points

An observational study recently completed by researchers in the Cleveland Clinic's Reproductive Research Center, the Glickman Urological and Kidney Institute and the Department of Obstetrics-Gynecology is the first to demonstrate that cell phone usage has adverse effects on multiple semen parameters.

We found a strong correlation between reduction in four sperm parameters and the highest rates of cell phone use among the 361 men studied.

Electromagnetic waves potentially exert their deleterious effects on sperm through thermal and nonthermal effects or a combination. The exact mechanism is still unknown, and is one of the critical questions to be answered.

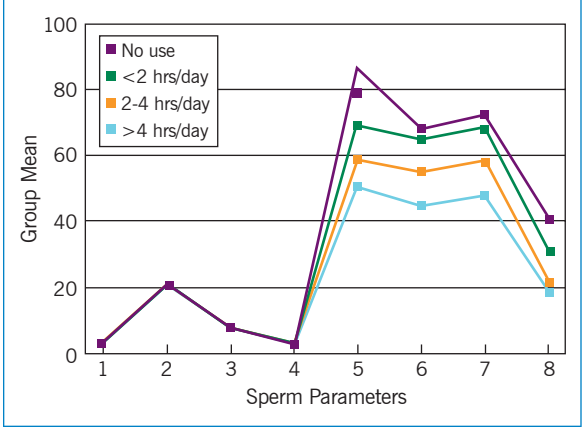
The values of these parameters were lowest in Group D (> 4 hr/day of use). As an example, average sperm count among the subjects in Group D was 50.30 x 106 /mL ± 41.92, compared with 58.87 ± 51.92 in Group C, 69.05 ± 40.25 in Group B and 85.89 ± 35.56 in Group A. Similar declines in motility, viability and percent of normal morphology were reported across all four cell phone usage groups. These four sperm parameters also showed significant positive correlation with each other.

When subjects were divided by sperm count into normospermic and oligospermic, motility and morphology still were significantly lower in those men who used cell phones for >4 hr/day. This suggests that the effects of cell phone use on sperm parameters are independent of the subject's initial sperm quality.

The study results were sufficiently dramatic to attract extensive media attention, but additional research is necessary. Electromagnetic waves potentially exert their deleterious effects on sperm through thermal and nonthermal effects or a combination. The exact mechanism is still unknown, and is one of the critical questions to be answered.

Given the vulnerability of spermatozoa to radiofrequency damage, and the clinical significance of this damage in terms of fertility, pregnancy and childhood health, human studies with a careful design are urgently needed to know the impact of RF waves from cell phones on testicular tissue and male germ line. Research is being conducted in our center utilizing better study designs (by eliminating possible bias due to patient demographics, lifestyle issues and environment) in order to verify our own results and explore the pathophysiology of damage caused by EMW emitted from cell phones on the male reproductive system. ■

Sperm parameter profile for cell phone use groups



The x-axis lists eight sperm parameters: 1 = volume; 2 = liquefaction time; 3 = pH; 4 = viscosity; 5 = sperm count; 6 = motility; 7 = viability; and 8 = percent normal morphology. Y-axis depicts the mean value of the corresponding sperm parameters for each cell phone use group.