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Less Motility of Sperm by Using of LED and LCD Displays

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ABSTRACT

The safety of human exposure to an ever- increasing number and diversity of electromagnetic field EMF sources both at work and at home has become a public health issue. Deficient sperm production may be affected by factors such as radiation and other environmental toxins. Raised body temperature for any reason, and raising scrotal temperature by sitting in sofa or in hot water for a long period of time, can reduce sperm production. Healthy young men who watched more than 20 hours of TV each week had a 44 per cent lower sperm count than those who watched almost no TV. Radiations and excessive heat to the genitalia have damaging effect on the testicles. Hence individuals having direct contact with or exposure to such chemicals have high chances of having primary or secondary infertility. . Intense exercise didn't raise sperm count if accompanied by lots of hours in front of the TV.

Keywords: Infertility, sperm count, EMF, motility, display.

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INTRODUCTION

Humans in modern society are exposed to an ever-increasing number of electromagnetic fields (EMFs) generated from the production and supply of electricity, television (TV) sets, personal computer (PC), radio communication, and mobile communication. Very low frequency (VLF) EMFs with 3 to 30 kHz frequency are generated from PC monitors or TV sets. EMFs from TVs or PCs have a 6.25 μT intensity with a 20 kHz frequency.¹ Studies saying that Prolonged TV viewing linked to the decreased sperm count and causes male infertility. Sitting on the sofa while watching TV might lower sperm count. It might be down to temperature - sperm prefer cooler conditions and production halts if the scrotum gets too hot.

Infertility is defined as the inability to fertilize the ovum; whereas sterility is defined as the lack of sperm production. More than 90% of male infertility cases are due to low sperm counts, poor sperm quality, or both. Physical activity has been associated with many health benefits, including reduced risks of obesity, diabetes and cardiovascular disease.² Men who do little exercise and spend much of their spare time watching TV have lower sperm counts than more active men, a study suggests. Yet, strenuous exercise has also been proposed as a risk factor for male factor infertility,³ Scrotal temperature is highly regulated by the body, and sperm production is greatly reduced at temperatures above 96° F. Based largely on data showing lower testosterone levels and semen quality among long-distance runners and cyclists.⁴⁻¹² Past studies, however, have largely evaluated the relation between exercise and cyclists.⁴⁻⁷ Past studies, however, have largely evaluated the relation between exercise and semen quality in a limited range of activities and focused exclusively on high-intensity training.⁸ In the United States, it is estimated that approximately 15% of the population falls into the category of being unable to conceive. In 40% of these cases, sperm abnormalities are either a factor or the factor. Male factor infertility is assessed based upon the following values:⁹ Deficient sperm count (less than 10 million per milliliter; volume should be 1 - 5 ml. of ejaculate) insufficient sperm motility (over 60% should be motile and demonstrate purposeful forward movement), and poor sperm morphology (more than 50-60% abnormal in form)

Mechanism Occurring During Display

Television (TV) watching, on the other hand, has been associated with many detrimental health consequences¹⁰ but its effects on semen quality remain unexplored. At the cellular level, an increase in free radicals and Ca^{2+} may mediate the effects of EMFs and lead to cell growth inhibition, protein misfolding, and DNA breaks. Sperm production will generally increase once the

temperature of the scrotum stays at its normal lower level (2°C below body temperature). However,¹¹ as it takes about 70 days for sperm to develop, it may take a few months of keeping the testes cooler for sperm production to improve. Scrotal temperature is highly regulated by the body, and sperm production is greatly reduced at temperatures above 96° F. Substantial and persistent increase in scrotal temperature can, in experimental settings, markedly disturb sperm production.¹² While sedentary work has been correlated to a moderate increase in scrotal temperatures, estimates of its impact on semen quality have been inconsistent.¹³ Physical inactivity has also been linked to increased oxidative stress levels which could play an important role in the pathophysiology of male factor infertility.

Radiations and excessive heat to the genitalia have damaging effect on the testicles. Hence individuals having direct contact with or exposure to such chemicals have high chances of having primary or secondary infertility. In the Young men who watch TV for just three hours a day have half the sperm count of men rarely found in front of the box, warn researchers. Men who are mostly sedentary lose out to those who are moderately active, says the Harvard University study in the British Journal of Sports Medicine. Experts say the effect could be due to lack of exercise, or to overheating of the testicles caused by prolonged sitting. Men who spend their time slumped in front of a TV may suffer from low sperm quality. Three hours of TV a day may have a sperm count of just half that of their more active

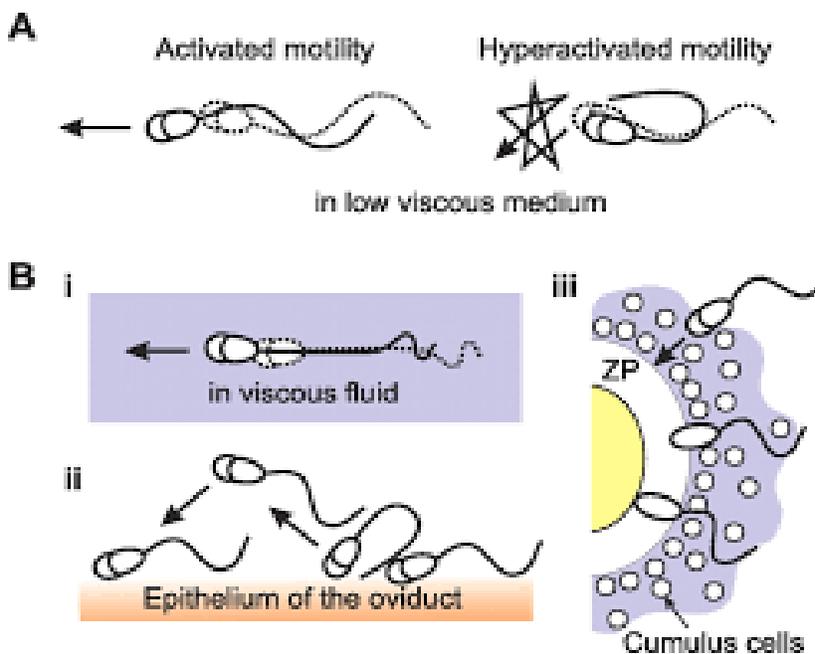


Figure 1: Motility of Sperm

Counterparts. Those who watched most TV, 20 hours or more, had a sperm count almost half that of men watching the least, and TV viewing seemed to cancel out the benefits of exercise.

Inactive Lifestyle

Semen quality appears to have deteriorated in most Western countries over the past few decades for reasons that are not clear. The study authors set out to find if an increasingly inactive lifestyle might play a role.¹⁴⁻¹⁵ The men were asked to say how many hours they usually spent a week doing vigorous, moderate, or mild exercise. They also said how much TV they watched on an average day, from none or almost none at all to over 10 hours. Men who were more physically active tended to have a healthier diet than those who watched a lot of TV every week. The analysis showed that those who were the most physically active - 15 or more hours a week had a 73% higher sperm count than the least physically active. When analyzed by exercise intensity, the results showed that light physical exercise made no difference to the sperm count, no matter how frequent it was.

Watching TV –Effect On Sperm Count:¹⁶

TV viewing had the opposite effect. Healthy young men who watch TV for more than 20 hours a week had a sperm count that was 44% lower than who watched the last¹⁷. But men who do 15 or more hours of moderate to vigorous exercise every week have sperm counts that are 73% higher than those who exercise for less than five hours a week, according to a new study published in the British Journal of Sports Medicine.

We know that men who wear too tight underwear have poorer sperm. So it's not a million miles away from sitting on the sofa for too long and heating up your testicles for too long. Unlike smoking or weight, the amount of TV viewing seemed to counteract the beneficial effects of exercise, although this may be a chance finding, the authors say. Caution that a reduced sperm count does not necessarily curb a man's fertility or his chances of being able to father a child. But the findings do suggest that a more physically active lifestyle may improve semen quality. The type of exercise might also be important, they say. Future studies should also evaluate the extent to which different exercise types affect semen quality.

Environmental Risk Factors

Current evidence suggests there may be environmental reasons for deteriorating sperm quality, including occupational exposure to various chemicals, heat, radiation, and heavy metals.¹⁸⁻²¹ In addition, exposure to environmental estrogens and pesticides has been linked to alterations in spermatogenesis. Lifestyle risk factors are also significant, including cigarette smoking, alcohol consumption, chronic stress, and nutritional deficiencies.²²

DISCUSSION

In this population of healthy young men, higher moderate to vigorous physical activity and lower TV watching were associated with higher sperm concentration and total sperm count but unrelated to sperm morphology, motility or sample volume²³⁻²⁵. These associations with sperm counts suggest that lifestyle changes such as increases in physical activity may positively influence sperm count and concentration in reproductive-aged men. TV watching (dichotomized as above and below the median, 14 hrs) significantly modified the association between moderate to vigorous physical activity and sperm concentration (p -interaction=0.02. Men who watched ≥ 14 hrs/week of TV had a significant positive association between physical activity and sperm concentration (P for trend= < 0.001) while men who watched <14 hrs/week of TV had no significant association between physical activity and sperm concentration (P for trend=0.69). Overall, men with the highest TV watching (≥ 14 hrs/week) and lowest physical activity (0 to 4.5 hrs/week) had the lowest adjusted mean sperm concentration, 24×10^6 /mL (95% CI 14 to 40). TV watching and semen quality has not been studied previously. Of closest relevance, however, are studies on the relationship between sedentary behavior and semen quality parameters. In two different studies, Hollund et al. showed that sedentary position at work was correlated with scrotal temperature in a dose-response manner,^{26,27} but unrelated to semen quality. In a large observational study of 1747 men, Stoy et al. found a suggestive, but not statistically significant, decline in sperm concentration across quintiles of sedentary work. More recently, Magnusdottir et al. showed that in men with normal semen quality, sedentary work was significantly more common among men with the lower sperm concentration (59%) compared to the men with the higher sperm concentration (22%). However, in this study it was difficult to disentangle the effect of obesity from that of inactivity.

CONCLUSION

Male infertility is a multifactorial disease process with a number of potential contributing causes. Considering the majority of male infertility cases are due to deficient sperm production of unknown origin, environmental and nutritional factors. While a reduced sperm count has been linked to lower fertility, The modifying effect of TV watching on the association between physical activity and sperm counts was unexpected as this has not been documented in previous literature. It is possible that this might be a chance finding; therefore further research is needed to confirm this result and explore the possible mechanisms of action. Intense exercise didn't raise sperm count if accompanied by lots of hours in front of the TV.

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