



Lifestyle factors connected with poor semen quality – should insulin resistance matter?

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Male infertility is a global health problem – it affects approximately 2.5-12% of men worldwide. It can be caused by reasons such as: spermatogenesis or spermiogenesis failure, as well as due to the existence of mechanical obstructions that prevent healthy sperm from fusing with the ovum. Many factors that affect semen quality come from lifestyle. Among them, factors such as physical activity, diet, psychological stress, or sleep quality can be distinguished. The metabolic disorder known as insulin resistance is related to these lifestyle components. The data was obtained through a systematic review of literature published from 1989 to 2020.

What lifestyle factors can affect semen quality?

Biological, chemical, or physical factors from the external environment, including those resulting from lifestyle, can affect semen quality positively or negatively.



DIET

- healthy dietary patterns and sperm concentration, its motility, and total count
- consumption of saturated fatty acids (SFA) and trans fatty acids has an adverse effect on the quality of semen
- consumption of omega-3 acids among men was connected with a higher semen volume and higher percentage of morphologically normal sperm
- DASH diet and Mediterranean diet are recommended in context of semen quality
- supplementation of components such as: zinc, vitamin B12, vitamin D, or antioxidants can improve semen quality
- normalizing body weight can improve semen quality



PHYSICAL ACTIVITY

- most researchers confirm a beneficial influence of recreational physical activity on the quality of semen both among healthy and infertile men
- resistance exercises have a positive effect on reducing inflammation in the body and reduce the level of oxidative stress, which correlates with improved semen quality
- excessive physical effort, regardless of the discipline, seems to have a negative impact on the quality of semen



OTHER

- poor sleep quality in men is connected with lower total motility, concentration, progressive motility, morphologically normal sperm, and total sperm count
- everyday stress is connected with reduced sperm motility, sperm concentration, and percentage of morphologically normal sperm
- both excessive tobacco smoking and alcohol consumption contributes to inflammation, which is one of the infertility causes



INSULIN RESISTANCE?

- body composition indicators that determine obesity, which can result from inappropriate eating habits, are correlated with the occurrence of insulin resistance
- physical activity is one of the factors that reduces and prevents insulin resistance
- with insufficient sleep, increased growth hormone secretion is observed, contributing to a reduced glucose uptake in muscles, which in turn leads to insulin resistance
- inflammation in the body, caused by tobacco, alcohol and mental stress, deregulates glucose metabolism and insulin secretion

Conclusions:

There may be a link between insulin resistance and poor semen quality. Further research in the context of its effect on the quality of semen are needed. Performing studies that would compare the quality of semen among insulin resistant and non-insulin resistant men could make it possible to establish a new direction in the diagnostics and treatment of male fertility.