

Vitamins and antioxidants in the management of male fertility

Couples seeking fertility often research, and employ, multiple options that may help increase success in achieving conception. For example, lifestyle factors, such as smoking cessation^[1] result in significant improvements; however, underwear type and duration of wear do not.^[2] One area of intervention that is frequently investigated by couples includes the use of vitamin supplementation.

The primary mechanism by which vitamins improve fertility is by increasing the amount of antioxidants available to the developing sperm. Antioxidants bind free radicals (unattached oxygen molecules), thus protecting both testicular tissues and sperm cell proteins and DNA from damage. Indeed, sperm is particularly sensitive to this type of damage since they do not contain any of the cellular repair systems present in other cells. As such, cellular damage caused by free radicals (termed oxidative stress), can be associated with poor semen parameters as well as decreased fertilization and pregnancy rates.^[3]

The reasons behind the popularity of vitamins are their wide availability over the counter as well as their cost-effectiveness, ease of use, low side-effect profile, and perceived benefits on overall general health. Unfortunately, research into the types and doses of vitamins for infertility has conventionally been poorly conducted. Indeed, many studies fail to control for confounding variables, such as diet, alcohol consumption, and air pollution exposure. These factors act to increase free radicals and serve to damage sperm to varying degrees.

Other issues when considering the benefits of vitamins on spermatogenesis includes a consideration for the differences in basic semen parameters calculated with different equipment (i.e., disparities between semen analyses interpretation standards) as well as any racial, geographic, and socio-economic variabilities. As such, studies on the benefits of antioxidants in male fertility have yielded inconsistent results that are almost impossible to generalize. Even when specifics are sought, the variability of the studies and the confusion among the different doses and types of antioxidants used makes it difficult to find solid, reliable data.

The rationale behind the use of vitamins is that the antioxidants they contain serve to decrease oxidative stress. This could be beneficial for spermatogenesis. The primary advantage of vitamins in such a scenario

would be to provide more antioxidants than males could typically consume through diet. For individuals who wish to improve their antioxidant profile, foods high in antioxidants include black beans, berries (blackberries, blueberries, and strawberries), dark chocolate, fruits such as oranges and apples, nuts, milk, carrots, apricots, spinach, peppers, avocados, and tomatoes.

When summarizing the available data on the many antioxidants available, the following beneficial agents are identified:^[3] (a) Glutathione (3 g, PO OD), (b) Vitamin E (400 mg, PO OD) (c) Selenium (225 µg, PO OD), (c) Vitamin C (1000 mg, PO BID), (d) Zinc (60 mg, PO OD), (e) Coenzyme Q10 (200 mg PO OD), (f) Zinc sulfate (220 mg PO OD), (g) L-carnitine (2 g/day), and (h) Lycopene (200 mg daily). Given these findings, future studies would be wise to include a vitamin that contains all the aforementioned antioxidants to best improve outcomes.

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