

Letters-to-Editor

ANTIOXIDANT THERAPY IN MALE INFERTILITY

Respected Sir,

Antioxidants are widely prescribed in patients with male infertility.

Evidence suggests that infertile men have higher level of semen reactive oxygen species than do fertile men. High levels of semen reactive oxygen species (ROS) can cause sperm dysfunction, sperm DNA damage and reduced male reproductive potential.

Seminal plasma contains a number of antioxidants (superoxide dismutase, catalase, glutathione peroxidase) and deficiency of these enzymes and has been reported to cause sperm DNA damage and male infertility. Seminal fluid also contains ascorbic acid, alpha tocopherol, pyruvate, glutathione, L-carnitine, taurine which form the bulk of it is antioxidant capacity. In addition, urate, pyruvate, albumin, beta carotenes and ubiquinol have been detected in seminal plasma.

Spermatozoa are particularly susceptible to oxidant injury due to the abundance of plasma membrane polyunsaturated fatty acids. Studies have shown seminal antioxidant capacity is suppressed in infertile men with high ROS levels compared to men with normal levels of ROS. It is possible that a subset of infertile men may be at risk for antioxidant deficiency like vitamin C. Treatment of oxidative stress should first involve elimination of stress provoking conditions like genital infection, smoking, hyperthermia and gonadotoxins.

In a systematic review of 17 randomized controlled trails (RCTs), 82% (14) showed an improvement in either sperm quality or pregnancy rate after antioxidant therapy. To date, most studies suggest that dietary antioxidant supplements are beneficial in improving sperm function and DNA integrity. But, the optimal dietary supplement has not been established.

Erectile dysfunction is caused by or exacerbated from impairment of vascular endothelial function. Lipoic acid and polyphenols not only directly improve endothelial derived nitric oxide but also they have long-term benefits to enhance antioxidant defences.

Role of *in vitro* Antioxidants in Protecting Spermatozoa from Semen Processing

There is conflicting evidence: Some studies have shown that vitamin E, glutathione, n-acetyl-cysteine are effective in preventing the decline in sperm motility during semen processing. Other studies report that antioxidants (glutathione and catalase) do not protect sperm from loss of motility during sperm processing.

It is not possible to establish firm conclusions regarding the optimal antioxidant treatment for male infertility because the published studies report on the different types and doses of antioxidants. Moreover, the presumed mechanism of action of antioxidants in the treatment of male infertility (suppression of seminal oxidative stress) has not been confirmed.

Since, there is no linear correlation between sperm quality and pregnancy rates, an improvement in semen parameters should not be the sole outcome considered in studies of antioxidant therapies. Even if beneficial effects were reported in a few cases of male infertility, more multicenter double-blind studies are required for the increased understanding of the effects of various antioxidants on fertility. The overall effectiveness still remains controversial.

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Respected Sir,

The contents of the journal have been very informative and are a boon to the busy practitioners. In the last issue, the role of uterine artery pulsatility index (PI) as an emerging promising marker in the management of gestational trophoblastic neoplasia was really a good one. The videos on surgery and hysteroscopy provided with the journal peep into the minor details of the subject. The section of Journal Scan recently introduced is really a good initiative.

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