

# In vitro treatment of Ham's F-10 medium supplemented with vitamin C and E on human semen characteristic in asthenozoospermic men

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## **Abstract**

**Background:** The levels of reactive oxygen species are normally limited by antioxidant defense mechanisms such as vitamin C and E that are present within seminal plasma and sperm plasma membrane. The Supplementing infertile males with antioxidant vitamin C and E is suggested as a potential treatment for idiopathic male infertility.

**Objective:** This study was designed to determine the effect of Ham's F-10 preparation medium supplemented with antioxidant vitamin C or E on semen samples prepared by conventional layering technique.

**Methods:** Liquefied semen (1ml) was layered beneath Ham's F-10 (1ml) enriched with 0.75 mg/ml vitamin C or E after in vitro sperm processing. However, semen samples were collected from a total of 60 asthenozoospermic men by masturbation after 3-5 days abstinence and allowed to liquefy at 37°C in 5% CO<sub>2</sub> for 30 minutes and evaluated according to standard world health organization (WHO) criteria before and after in vitro sperm activation. The semen samples were divided into three groups, one group considered as a

control group which had no antioxidant added, and the other two groups were prepared in the presence of antioxidant treatment (either vitamin C or vitamin E).

**Results:** The supplementation of sperm preparation medium with vitamin C or vitamin E significantly ( $P < 0.001$ ) improved and augmented the seminal parameters including sperm concentration, sperm motility, progressive sperm motility, and normal sperm morphology when compared to that of the control group.

**Conclusion:** It was concluded that supplementation of medium with antioxidant vitamin C or E actually improve sperm quality, but the better improvement appeared to be with vitamin C.

**Key words:** Antioxidant, vitamin C, sperm preparation technique, asthenozoospermia

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## **Introduction**

Infertility affects 15% of couples and is cause of infertility in 30% of those couples is associated with aberrations found in male partner termed male infertility. Many cases of male infertility were previously considered idiopathic but are now being attributed to oxidative sperm damage resulting from the pathologically increased levels of reactive oxygen species <sup>(1)</sup>.

In contrast, high levels of ROS are harmful and lead to lipid peroxidation. However, ROS can be produced by immature spermatozoa and leukocytes <sup>(2)</sup>. In normal sperm physiology, low levels of ROS are beneficial to stimulate sperm capacitation, enhance zona pellucida binding and promote acrosome reaction <sup>(3)</sup>.

of sperm plasma membrane and DNA fragmentation <sup>(4)</sup>. Increased lipid peroxidation is associated with impaired sperm motility and diminished capacity for sperm-oocyte fusion <sup>(5)</sup>. One study found that men with high levels of ROS were 7 times less likely to achieve a pregnancy than men with low levels <sup>(6)</sup>.

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