

synthesis in the Leydig cell. Since zinc plays an important role in 5 α reductase enzyme that is necessary for the conversion of testosterone into biologically active form 5 α dihydro-testosterone⁽²³⁾. The authors concluded that adequate seminal concentration of the Zn is required for normal sperm function. It has been demonstrated that Zn in human semen is derived from the prostate⁽¹²⁾. Zn appears to be a potent scavenger of excessive superoxide anions produced by defective spermatozoa and/or leukocytes in human semen after ejaculation⁽³⁰⁾.

The results of this study also showed that Cu concentration was significantly decreased in seminal plasma of asthenozoospermic patients while insignificantly increased in oligospermic. This result is compatible with that observed by others⁽¹⁵⁾. Copper is an essential trace element that plays an important role in several enzymes such as cytochrome oxidase, ferroxidase, superoxide dismutase and spermin oxidase. Human spermatozoa are particularly susceptible to peroxidative damage because they contain high concentrations of polyunsaturated fatty acids and also possess a significant ability to generate a reactive oxygen species (ROS), mainly superoxide anion and hydrogen peroxide. Superoxide dismutase (Cu-metalloenzyme) protects human spermatozoa from this peroxidative damage⁽¹⁵⁾. Liang Lu et al 2009⁽³¹⁾ suggested that Cu²⁺ can affect male reproductive function through T-type Ca²⁺ channels. *In vitro* studies, Roblero et al⁽³²⁾ have demonstrated the effect of Cu²⁺ on the motility viability, acrosom reaction and fertilizing capacity of human spermatozoa. On the basis of the present observations and those of others seminal fructose, zinc and copper may contribute to fertility through their effects on various semen parameters. Adequate seminal plasma concentration of fructose, Zn and Cu are

required for normal sperm function and that high toxic concentrations of Zn and Cu in seminal plasma are apparently related to defective motility of sperm in infertile males. It seems that the estimation of seminal fructose, Zn and Cu may help in the investigation and treatment of infertile males.

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