

## A Comparative Study of Fructose, Zinc and Copper Levels in Seminal Plasma in Fertile and Infertile Men

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### Abstract

**Background** Human semen contains high concentrations of fructose, zinc (Zn) and copper (Cu) in bound and ionic forms for Zn and Cu. The presence of abnormal levels of fructose and those trace elements may affect spermatogenesis with regard to production, maturation, motility and fertilizing capacity of the spermatozoa.

**Objective** To evaluate the levels of fructose, Zn and Cu in seminal plasma in different groups of male infertility and to correlate their concentrations with various sperm parameters.

**Methods** The concentrations of fructose, Zn and Cu were measured in 114 semen samples from normozoospermic, oligozoospermic, astheno-zoospermic, and azoospermic men using the electrothermal-atomic absorption spectrometry for Zn and Cu determination. The concentration of fructose in seminal plasma was determined with a spectrophotometric method, using the resorcinol method.

**Results** Results of the present study showed that there was an inverse relationship between fructose levels and sperm count. The mean value of seminal plasma fructose concentrations was significantly increased ( $p \leq 0.001$ ) in the three groups of infertile male subjects (azoospermia, asthenozoospermia and oligozoospermia) than in fertile males. The mean value of seminal plasma Zn concentrations was significantly decreased ( $p \leq 0.001$ ) in the three groups of infertile male subjects (azoospermia, asthenozoospermia and oligozoospermia) than in fertile males. A good correlation in a positive direction was noted between the sperm count and seminal plasma Zn concentration. There was significant decrease in seminal plasma Cu concentration between asthenozoospermia and control groups ( $p \leq 0.05$ ) and insignificant increase in oligozoospermic patients.

**Conclusions** On the basis of the observations of the present study, seminal fructose, zinc and copper may contribute to fertility through their effects on various semen parameters.

**Key words** Male infertility, fructose, zinc, copper.

### Introduction

Infertility has often been defined as failure to achieve pregnancy within one year of unprotected intercourse. Infertility has multiple causes and consequences depending on the gender, sexual history, life style of society and cultural background of people it affects <sup>(1)</sup>. Infertility affects about 8-12% of the world's population and

in about half of cases men are either the single cause of or contribute the couple's infertility <sup>(2)</sup>.

Fructose concentration, because it is considered a measure of seminal vesicle function, has been studied in great detail. Studies indicate that there is a wide variation in fructose concentration <sup>(3)</sup>, and