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Zinc in Infertility and Infection

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ABSTRACT: Seminal zinc may be associated with seminal and prostatic function. The role of zinc in genital tract infection and infertility is controversial. The study was undertaken to elucidate the role of zinc in infertility and infection in order to explain the increasing rise in male infertility.

Eighty-three adult males aged 18-56 years participated in the study. 25 were fertile, 45 were infertile while 15 had sexually transmitted diseases (STDs). Zinc was estimated by atomic absorption spectrophotometry. Students t-test and ANOVA- one way were used for analysis of data.

Seminal zinc values were not significantly different between groups tested and within the infertile groups ($p > 0.05$). It is suggested that seminal zinc may have little or no contribution to infection and infertility.

Key words: Zinc; Semen; Male infertility; Sexually transmitted diseases.

Introduction

Infertility is a profound and widespread problem affecting an estimated 15% - 20% or more couples who are trying to conceive (1,2). Whether the problem lies with the female or male, for many patients, infertility may mean the dissolution of a couple's entire life span (1).

In about half of the cases of infertility, there is a contributing male factor. However, the distinction between a man with normal fertility and one with reduced fertility may be difficult (1,2). Efforts therefore, have been intensified recently on the elucidation of the aetiological factors responsible for male infertility (4).

Seminal zinc may be associated with seminal and prostatic function. Infection of the genital tract was implicated as a causative factor of infertility. Male accessory gland inflammation may interfere with reproductive potential and can result in the glands secretory dysfunction (4 – 8). However, the role of zinc in genital tract infection and infertility is controversial (9 – 12).

This study was undertaken to elucidate the role of zinc in infertility and infection which may explain the increasing rise in male infertility.

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Materials and Methods

Subjects

Eighty-five adult males aged 18-56 years were admitted into the study. Twenty-five were fertile males with satisfactory semen profile, 45 were infertile for at least 1 year while 15 were men with incontrovertible evidence of sexually transmitted diseases (STDs). Informed consent was obtained from these men.

Samples

Semen was collected by masturbation after abstinence from sexual relations for 3 days. It was centrifuged at 3,000 rpm for 30 minutes. Seminal plasma obtained was stored at –20°C for analysis of zinc.

Zinc estimation

Zinc estimation was done using atomic absorption spectrophotometry (13,14).

Statistical Analysis

Statistical analysis was carried out by means of computer statistical software EPI-INFO 6.02. Student's t-test (unpaired) and analysis of variance (ANOVA) were used for comparison of means.

Results

There were no significant differences between the mean values of zinc in fertile, infertile and STDs males ($p > 0.05$; Table 1). Within the group of infertile men, there was no significant difference in mean zinc values between normospermic and dyspermic males ($p > 0.05$; Table 2).

Table 1: Statistical comparison of mean seminal plasma zinc levels in fertile, infertile and STDs subjects (using ANOVA-one way).

	Groups			t	p
	Fertile	Infertile	STDs		
n	25	45	15	0.046	0.97
Zinc (µg/ml)	128.3 ± 15.0	133.9 ± 11.0	134.0 ± 18.0		

Values represent the mean ± S. E.

Table 2: Statistical comparison of mean seminal plasma zinc levels in normospermic and dyspermic infertile men (using student's t-test).

	Infertile males		t	p
	Normospermic	Dyspermic		
n	12	23	0.070	0.94
Zinc (µg/ml)	135.2 ± 20.0	133.4 ± 16.0		

Values represent the mean ± S. E.

Discussion

Soffer *et al* (15) demonstrated significantly lower zinc level in men with prostatovesiculitis with positive mycoplasma and/or chlamydia cultures compared with non-infected cases indicating a decreased prostatic function. Low levels of zinc were also reported in oligospermic and azoospermic patients (16). Altered sperm motility was associated with a probabl;e impairment of sex accessory gland function in subjects with idiopathic asthenozoospermia (10).

In this present study, we did not find significant differences in mean zinc levels in fertile, infertile and STDs groups ($p > 0.05$; Table 1). Within the groups of infertile men, no significant difference was also observed in mean zinc levels between normospermic and dyspermic infertile men ($p > 0.05$; Table 2). This suggests that the contribution of zinc to either infection or infertility is minimal. These findings are in agreement with that of Ladipo *et al* (7), who reported no significant correlation between the semen and blood zinc concentration and the fertility potential in three groups of men studied – normospermic group, cases with doubtful pathologic findings and cases with severe pathological findings. Similarly, Adejuwon *et al* (11) did not find any significant difference in zinc levels between normospermic, oligospermic and azoospermic infertile men. Chia *et al* (17) did not also find any relationship in zinc levels between idiopathic infertile men and normals. Neither did Upadhyaya *et al* (12) find any relationship between zinc and infection of the genital tract. Zinc may have no contribution in infertility or infection.

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