

Study in Bangladesh shows zinc is an essential element in male fertility

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Trace levels of zinc present in semen are a vital determinant of male fertility, a recent study in Bangladesh capital Dhaka concludes.

The study, titled "Impact of Seminal Plasma Zinc and Serum Zinc Level on Semen Parameter of Fertile and Infertile Males," was done at the Center for Assisted Reproduction, a tertiary infertility center and at the Biochemistry Department of Bangabandhu Sheikh Mujib Medical University (BSMMU).

A total of 16 fertile males were taken as control and 69 infertile males were taken as cases in the study. Serum [zinc](#) and seminal [plasma](#) zinc levels were measured for analysis. Professor Parveen Fatima, the lead author of the study, says, "In the group of fertile men, we found serum (blood) zinc level lower than for the infertile group, whereas the seminal plasma (fluid) zinc level was higher in the fertile than the infertile group which was not statistically significant."

Zinc is an essential trace element required for normal production of sperm cells and steroid like sex hormones – testosterone. Its deficiency is one of factors responsible for decreased testicular (male reproductive organs) function in infertile males.

Professor Fatima explains, "Higher seminal plasma zinc concentration has positive correlation with sperm count, motility and serum testosterone (sex hormone) levels having most important effect on [sperm motility](#). It helps in stiffening of outer dense fibers by formation of

disulfide bridges or strong bonding protein molecules during sperm maturation, which is an essential step for generation of sperm motility; especially progressive motility as shown in the study."

Zinc deficiency affects sperm production, maturation and motility, as well as fertilizing capacity of the active matured sperm cells.

The high level of zinc found in semen is primarily due to secretions of the prostate, the study notes.

Zinc contributes to fertility through its significant effects on various semen parameters. Zinc in seminal plasma stabilizes the cell membrane and nuclear chromatin or accumulation of complex proteins that contain coded functions of life of the [sperm cells](#).

In the fertile group, all parameters showed positive relationship; and in the infertile, except [sperm](#) morphology, all other parameters showed negative relationship. In the fertile group, only semen motility showed a statistically significant relationship but none in infertile group.

The human body contains approximately two grams of zinc in total. The daily requirement of zinc per day is 10 micrograms for adult women and 12 mg for adult men.

The World Health Organization (WHO) estimates that [zinc deficiency](#) affects one-third of the world's population (about two billion people) with the prevalence rates ranging from four to 73% in various regions.

The study concludes that zinc may contribute to fertility through its significant effects on various [semen](#) parameters. It appears that the estimation of seminal plasma zinc may help in investigation and treatment of infertile males.

More information: Parveen Fatima et al. Impact of Seminal Plasma Zinc and Serum Zinc Level on Semen Parameter of Fertile and Infertile Males, *Journal of Bangladesh College of Physicians and Surgeons* (2017). DOI: [10.3329/jbcps.v35i1.32566](https://doi.org/10.3329/jbcps.v35i1.32566)

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