

Abstract

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The importance of folate, zinc and antioxidants in the pathogenesis and prevention of subfertility.

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OBJECTIVE: Current treatments of subfertile couples are usually empiric, as the true cause of subfertility often remains unknown. Therefore, we outline the role of nutritional and biochemical factors in reproduction and subfertility.

METHODS: A literature search was performed using MEDLINE, Science Direct and bibliographies of published work with both positive and negative results.

RESULTS AND DISCUSSION: The studies showed that folate has a role in spermatogenesis. In female reproduction, folate is also important for oocyte quality and maturation, implantation, placentation, fetal growth and organ development. Zinc has also been implicated in testicular development, sperm maturation and testosterone synthesis. In females, zinc plays a role in sexual development, ovulation and the menstrual cycle. Both folate and zinc have antioxidant properties that counteract reactive oxygen species (ROS). Thiols, such as glutathione, balance the levels of ROS produced by spermatozoa and influence DNA compaction and the stability and motility of spermatozoa. Oocyte maturation, ovulation, luteolysis and follicle atresia are also affected by ROS. After fertilization, glutathione is important for sperm nucleus decondensation and pronucleus formation. Folate, zinc, ROS and thiols affect apoptosis, which is important for sperm release, regulation of follicle atresia, degeneration of the corpus luteum and endometrial shedding. Therefore, the concentrations of these nutrients may have substantial effects on reproduction.

CONCLUSION: In conclusion, nutritional and biochemical factors affect biological processes in male and female reproduction. Further research should identify pathways that may lead to improvements in care and treatment of subfertility.

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