The Role of Environmental Epigenetic in Male Infertility

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Background:

Environmental epigenetic has an important role in decreasing male fertility has been observed for the past fifty years. Examples of affected reproductive parameters include decreases in sperm count and sperm quality and increases in testicular cancer, cryptorchidism and hypospadias. The current review will describe epigenetic for the etiology of male infertility that can be dramatically influenced by the environment.

Materials and Methods:

The present study was retrospective and by using library and internet resources are provided.

Result

The erasure of DNA methylation occurs when primordial germ cells migrate to the genital ridge and gonads. Re-methylation is initiated during the first events of sex determination. This period in germ cell development and epigenetic programming represents a window of sensitivity to environmental factors. Examples of epigenetic modifications that are environmentally induced and associate with male infertility exist. For instance, exposure of adult male rats to different doses of butyl-paraben and exposure of adult male mice to methoxychlor have been shown to alter DNA methylation in sperm. Neonatal exposure to BPA is detrimental to spermatogenesis and has been shown to alter DNA methylation of the IGF2-H19 imprinting control region in sperm and of the estrogen receptors alpha and beta in testis. Prenatal exposure to ethanol has been shown to induce decreased spermatogenesis and sperm DNA methylation changes in imprinted genes. Different laboratories have shown that an early developmental exposure to the fungicide vinclozolin increases spermatogenic cell apoptosis and alters sperm DNA methylation . Interestingly, vinclozolin-induced effects are observed to be transgener-ationally transmitted through a process known as epigenetic transgenerational inheri-tance.

Conclusion

Epigenetic transgenerational inheritance is a phenomenon to be considered in disease etiology, reproduction and human fertility. Clearly, considering only genetic mutations cannot completely explain disease etiology. Environmental exposures and related epigenetic changes are equally important for consideration.

Key word: Environment, epigenetic, male, infertility