

ASSESSMENT OF RELATIVE TELOMERE LENGTH IN HUMAN MALE SPERM WITH REPRODUCTIVE CHALLENGES

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Telomeres are biologically conserved, multifunctional DNA-protein complexes that are essential for maintaining chromosomal stability and genomic integrity, which is age-dependent in somatic cells. At the same time, it increases in sperm cells with age. According to recent investigations, sperm telomere shortening could be a critical factor in male infertility, making it a key indicator for those experiencing reproductive challenges. To investigate the germ cell telomere length in men experiencing reproductive challenges.

Case-control study was conducted involving 123 infertile men and a control group of 50 men with proven fertility, all aged between 21 and 52 years. Semen profiling was performed following the latest World Health Organization (WHO) guidelines published in 2021. Relative sperm telomere length was calculated as T (telomere)/S (single copy gene) ratio and compared between men experiencing reproductive challenges and fertile groups. Two sample t-test was performed to compare variations between men undergoing fertility treatment and those in a fertile group. p-values less than 0.05 were considered statistically significant.

According to semen analysis, samples were classified into various categories, including asthenozoospermia, asthenoteratozoospermia, oligoasthenoteratozoospermia, oligoasthenospermia, oligoasthenozoospermia, teratozoospermia, oligospermia, and oligoteratozoospermia. The relative STL lengths were significantly shorter in test samples compared with fertile individuals.

Current investigation aims to highlight a new emerging parameter that could serve as a reliable prognostic indicator for males experiencing reproductive challenges as telomere truncation below a certain threshold could be used as a novel tool for detecting sperm quality, male infertility, and predicting embryonic development.