SPERM VITRIFICATION AND TELOMERE LENGTH: A PILOT STUDY IN MALE CANCER PATIENTS

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Abstract Body

Cancer is prevalent worldwide. Treatment of cancer requires substantial medical care that includes chemotherapy and radiotherapy. Infertility is the usual side effect of such therapeutic options. Therefore, preserving fertility is crucial especially in adult male cancer patients. Sperm cryopreservation is the well-known option for fertility preservation in these patients. Compared to conventional methods, vitrification has shown better gamete and embryo freeze thaw survival but cryopreservation induced ROS mediated damage is also reported. Recent studies have shown sperm telomere length (STL) is one of the molecular markers of fertility and early embryo development. Therefore, it is essential to study the effect of sperm vitrification on STL in cancer patients.

Material and Methods –This was a pilot project in which 05 male cancer patients (cases) and 05 fertile males (controls) were enrolled. Semen sample was collected before any cancer treatment started. Semen analysis was performed as per WHO manual 2020. STL was assessed by qPCR and T/S ratio was calculated as per protocol by Cawthon et al., 2002. Analysis was done before vitrification and 2 weeks after vitrification of semen samples and results were compared between cases and controls.

Results- Sperm motility, vitality, and morphology were reduced after vitrification and the difference was found statistically significant ($p<0.05$). The average motility in post vitrified samples was 27% in control and 22% in cases, Vitality was 28% in controls and 20% in cases and morphology was 4% and 2% respectively. The difference in relative telomere length between cases and controls was not found statistically significant ($p>0.05$) both before and after vitrification of semen samples.

Discussion and Conclusion- To the best of our knowledge as per data from different internet sources, this is the first project aimed to study the effect of sperm vitrification on STL. Our results are in line with previous studies that showed decrease in sperm parameters post- vitrification. Although STL before and after vitrification did not show any significant differences in cases and controls but the overall decrease in STL was observed in post-vitrified samples. The direct oxidative damage to guanine bases in telomeric DNA may be the cause of ROS-induced telomere shortening. As a result, the ROS-mediated decrease in sperm parameters, particularly STL, is suggestive of the underlying etiology.