9th Yazd International Congress and Student Award on Reproductive Medicine with 4th Congress of Reproductive Genetics

Poster Presentations

P-39

Protective effects of zinc on rat sperm chromatin integrity involvement: DNA methylation, DNA fragmentation and protamination after bleomycin etoposide and cis-platin treatment

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Background: Testicular cancer is the most common malignancy that threatens the male in their reproductive age. Combined treatment by bleomycin, etoposide, cis-platinum (BEP) is the most effective strategy for patients with testicular cancer, and these chemotherapeutic agents can increase the 5- years survival rate. BEP treatment has revealed negative side effects on different germ cells, finally impacting reproductive function and fertility. In addition to cancerous cells, oxidative stress due to BEP treatment can destroy testicular germ cells and induce changes in chromatin integrity.

Objective: We decided to investigate recovery effect of zinc (Zn) on chemotherapy-induced complications in rat chromatin integrity and protamination.

Materials and Methods: The male rats (n = 40) were treated with BEP at appropriate dose levels of BEP (0.75, 7.5, and 1.5 mg/kg) for 9 week, with or without Zn; Sperm DNA methylation through immunofluorescence, DNA fragmentation and protamination were evaluated through acridine orange staining and Chromomycin A3 staining.

Results: The mean percentage of global DNA methylation sperm was significantly reduced as compared with the control group ($p < 0.001$). In BEP+ Zn group, the mean percentage of global DNA methylation increased compared to BEP group. In Zn group, the mean percentage of global DNA methylation had no significant difference compared with the control group. Following BEP treatment, the mean sperm count that represented DNA fragmentation was significantly increased ($p < 0.001$). In addition, the mean percentage of DNA fragmentation was reduced in the BEP + Zn group in comparison with the BEP group, but not as much as the control Group ($p < 0.001$). The mean percentage of DNA fragmentation in rats treated with Zn indicated no significant difference compared with the control group. Rats treated with BEP showed significantly increased protamine deficiency sperm as compared with the control group ($p < 0.001$). In the BEP + Zn group, recovery in protamination was observed compared with the BEP group, but there is still significant difference in comparison with the control group ($p < 0.05$). The significant difference was observed between Zn and control group ($p < 0.05$).

Conclusion: Our findings confirm the recovery effects of Zn on rat sperm chromatin integrity following BEP consumption. It is suggested that Zn be utilized as an antioxidant following chemotherapy.

Key words: *Spermatozoa, DNA methylation, Protamination.*

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