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Oral Presentations

O-31
Impact of sperm parameters on mRNA level of AnnexinA2, Sp17, SerpinA5, Prdx2, oxidative stress, and sperm DNA fragmentation

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Background: Today, it has been shown that having the normal sperm parameters cannot only represent fertility status of male partners of infertile couples. The potential role of several molecular and cellular factors associated with fertilization and embryo failure is not clearly identified.
Objective: The aim of this study was to investigate the association between sperm DNA fragmentation, oxidative stress as well as some sperm functional genes and the sperm parameters among both men of infertile couples with a history of recurrent early pregnancy loss and fertile men.
Materials and Methods: The mRNA levels of the *AnnexinA2*, *Sperm protein 17* (*Sp17*), SerpinA5, and *Peroxiredoxin-2* (*Prdx2*) genes were comparatively evaluated between sperm samples of infertile men with abnormal parameters (n = 25), male partners of infertile couples with normal parameters (n = 25), and the fertile men with normal sperm parameters (n = 25) as experimental group I, II and control, respectively by using quantitative real time polymerase chain reaction. The sperm DNA fragmentation (SDF) was assessed using Chromomycin A3 (CMA3), acridine orange (AO), annexin V (ANXV) staining and Propidium iodide (PI). Sperm maturity was evaluated by acrosom reaction test. To determining the stress oxidative, malondialdehyde (MDA) and total antioxidant capacity (TAC) levels were measured in seminal plasma.
Results: The gene expression profile of *SP17* showed a significant down-regulation between experimental I as well as experimental II and control group ($p < 0.005$ and $p < 0.0007$, respectively). In contrast, *SerpinA5* mRNA level was significantly down-regulated in experimental groups I ($p < 0.05$). Both experimental groups showed an increase in *PRDX2* mRNA level. However, there was a significant association between experimental group II and controls based on *PRDX2* gene expression. Also, there was no significant difference between three groups in accordance of *AnnexinA2* gene expression levels. The results demonstrated significant higher rates of CMA3+ and AO+ sperm cells in both experimental group I and II compared to the controls. The most numbers of necrotic sperm cells were detected in experimental group I based on PI staining. However, we found no significant change in early apoptotic rates (ANXV+) of sperm specimen between all study groups. There was a significant decrease in acrosome-reacted spermatozoa in experimental group I in comparison with controls. Furthermore, a significant positive correlation was seen between seminal MDA and TAC concentration.
Conclusion: The data indicates that *Sp17* not only has potential functions in the fertilization process, but also in the developing embryo at stages of implantation and pregnancy maintenance. *SerpinA5* gene expression is strongly associated with abnormal sperm morphology. SDF plays a role as a major cause of male infertility independent of the sperm parameters.
Key words: *Sperm parameter, Gene expression, DNA fragmentation, Reactive oxygen species.*