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

Oral Presentations

O-25

Evaluation of the effect of granulocyte-macrophage colony stimulating factor on sperm quality in oligoasthenoteratospermia men

Tanhaye Kalate Sabz F[1], Ashrafi M[1, 2], Amjadi F[1], Aflatoonian R[3], Zandieh Z[1], Hosseini E[4].

1. *Department of Anatomical Science, School of Medicine, Iran University of Medical Sciences, Tehran, Iran.*
2. *Shahid Akbar Abadi Clinical Research Development Unit, Iran University of Medical Sciences, Tehran, Iran.*
3. *Department of Endocrinology and Female Infertility,Reproductive Biomedicine Research Center, Royan Institute for Reproductive Biomedicine, ACECR, Tehran, Iran.*
4. *Department of Obstetrics and Gynecology, IVF Clinic, Mousavi Hospital, Zanjan University of Medical Sciences, Zanjan, Iran.*

Email: Amjadi.bh@gmail.com

Background: Oligoasthenoteratospermia (OAT) is characterized by abnormalities in sperm count, motility and morphology. Poor sperm quality can adversely affect the results of assisted reproductive technique. Development of sperm media is necessary to improve the sperm parameters of these patients. Granulocyte-macrophage colony stimulating factor (GM-CSF) is a natural growth factor produced by the reproductive organs, previous studies show that this growth factor in the semen of infertile men is lower than that of fertile men. However, there is no study to assess the effect of GM-CSF on sperm quality.

Objective: The aim of this study is to evaluate the effect of GM-CSF as a sperm medium supplement on sperm quality in OAT patients.

Materials and Methods: In the present study, semen specimens were collected from 20 OAT patients who have male infertility factors, according to WHO criteria. After the swim-up washing procedure, each of the samples was divided into two groups; experiment, and control. In the experimental group, samples were incubated with a medium containing 2 ng/ml GM-CSF for one hour, yet, in the control group, the sperms were incubated without GM-CSF for the same time. The sperm motility was examined with phase-contrast microscopy, Eosin-nigrosin staining method was used to assess sperm viability, and DNA fragmentation were evaluated by TUNEL test. The expression of sperm glucose transporters (GLUT 1, 3) was determined using Immunofluorescent staining, the phospho-Akt/total Akt ratio was assessed by the Western blotting method. Data were analyzed by SPSS software and P-value < 0.05 was considered statistically significant.

Results: As compared to the control group, supplementation with GM-CSF improved sperm progressive motility, enhanced GLUT 1 and 3, and phospho-Akt/total Akt expression ($p < 0.05$). In GM-CSF treated groups, DNA fragmentation was lower than control ones ($p < 0.05$). There was no significant difference between the viability of the control and experimental groups.

Conclusion: Our results showed that GM-CSF can improve sperm quality by influencing motility and energy metabolism in spermatozoa which can be affected by increasing the phosphorylation of AKT for the first time. This growth factor could be an appropriate supplement in sperm media for OAT patients.

Key words: *GM-CSF, Oligoasthenoteratospermia, Sperm quality.*