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Transcriptomic alternation of chemokines secreted from fallopian tube epithelial cells in response to spermatozoa

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Background: Immunological response of female reproductive system to the allogenic spermatozoa is very essential for a successful fertilization and pregnancy. Fallopian tubes are the focus of this investigation since they are places in which spermatozoa are stored for a period until oocytes are ready for fertilization. Chemokines have been shown to play important roles in reproductive immunology by their chemo-attraction potential and inflammatory function. Previous studies also showed that specific chemokines can increase the survival chance of spermatozoa by modulating female immune system.

Objective: For a better understanding of how chemokines contribute with the maternal immune system in the presence of spermatozoa, we evaluated transcriptional changes of different chemokines from fallopian tube cell line in the presence of spermatozoa by PCR-array.

Materials and Methods: Semen samples were collected from 10 healthy donors who had at least one

child. Samples were analyzed according to the WHO standard. To investigate the impact of spermatozoa on chemokines' expression from epithelial cells, the fallopian tube cell line (OE-E6/E7) was co-cultured with the spermatozoa for 24 hr. The cell line without any spermatozoon was analyzed as the control group. After the co-incubation period, RNA extraction was done from washed cells. cDNA was synthesized and chemokines' expression were evaluated by PCR-array. Finally, Independent sample *t* test was applied to compare differences between the groups. Furthermore, IL-8 which had the most expression compared to other chemokines is evaluated in the culture medium by ELISA.

Results: Data analysis indicated that the spermatozoa resulted in down regulation of chemokines. It has been shown that CX3CL1 which involves in T cell migration, and inflammatory chemokines such as IL-8, CXCL9 and CXCL13 were significantly decreased in the presence of the spermatozoa. IL-8 concentration in the case group was also lower than the control. Furthermore, CCL chemokines with the role in migration of inflammatory cells to the target tissue were significantly down regulated. These chemokines alternation can cause higher survival chance of the spermatozoa by preparing an anti-inflammatory condition in the fallopian tubes.

Conclusion: Compatible with previous studies our results have shown that spermatozoa can adapt to the immune system of female reproductive tract by regulating specific chemokines expression. Chemokines are appeared to be essential for preparing a safe microenvironment in the fallopian tubes for the spermatozoa.

Key words: Chemokine, Fallopian tube, Spermatozoa, Fertilization, PCR array.