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

Key Lectures

K-38
Ex vivo spermatogenesis: Static or dynamic culture system

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Infertility is one of the most important problems in human societies, today. This issue can change the social life of infertile couples and has nothing to do with the cause of infertility. However, it should be noted that about 50% of infertility cases are related to men. In vitro germ cell maturation and enrichment transfer techniques could potentially help to preserve fertility, especially in pubertal males without mature germ cells. In addition, this technique could also be potentially used for the treatment and the maintenance of biological paternity of oligozoospermic or azoospermic patients. Today, with advances in reproductive biotechnology, it is possible to produce in vitro male haploid cells. This matter can help a large group of infertile patients. To achieve this goal, many researchers have studied different culture systems and other factors involved in stimulating ex vivo spermatogenesis. Various methods have been proposed, including organ culture system, two/three-dimensional culture and isolated cell culture method or adding the required supplements of tissue or cell in the culture medium. In order to bring the culture system closer to the in vivo conditions with the aim of spermatogenesis, major changes are necessary. One of these changes is the use of dynamite culture instead of static culture. Recently, bioreactor, in which biological or biochemical processes are developed under a closely monitored and tightly controlled environment, is one of the latest approaches that often used to culture cell and tissue in-vitro. It is suggested that the organotypic culture of testicular tissue or fragments is capable of maintaining the architecture and viability of germ cells, and induction of in-vitro spermatogenesis. Moreover, the addition of a mini-bioreactor or microfluidic device has shown the potential to improve organotypic culture systems, as it can lead to long-term ex vivo maintenance of testis tissues which is required for producing sperm. Although these techniques have only been applied in lab animals, there is reproductive technology advancement hope for the near future that these methods will also give surprising results in humans.