

# BÖLÜM 6

## Spermatogonial Kök Hücre Uygulamaları

Önder ÇELİK<sup>1</sup>  
Nilüfer ÇELİK<sup>2</sup>  
Sudenaz ÇELİK<sup>3</sup>

### GİRİŞ

Spermatogenez seminifer tübüllerde gerçekleşen ve masif mitotik bölünmeyle karakterize organize bir süreçtir. Spermatogonia (SG) diploid hücreler olup mayoz bölünme ile haplodizasyona uğrayarak spermatozoidlere farklılaşır. Haploid spermatozoidler başlangıçta yuvarlak (round) olup elonge spermatozoidlere dönüşerek epididime ulaşırlar ve burada olgunlaşırlar. Puberteden itibaren ilerleyen yaşlara kadar spermatogenezin idamesini spermatogonial kök hücre (SSC) dediğimiz kendilerini yenileme ve farklılaşma potansiyeline sahip hücre popülasyonu sağlar. Dünya yüzeyinde yaklaşık yüz milyon erkek kemoradyoterapiye bağlı ya infertilidir ya da subfertilidir. Azospermik veya semen parametrelerinde ciddi problem olan hastaları da bu gruba dahil ettiğimiz zaman SSC naklinden umut bekleyen büyük bir hasta grubuyla karşı karşıya kalırız (1-3).

<sup>1</sup> Prof. Dr., Özel Kadın Hastalıkları ve Doğum Muayenehanesi, celiksudenaz@gmail.com

<sup>2</sup> Doç. Dr., Behçet Uz Çocuk Hastalıkları Eğitim ve Araştırma Hastanesi, Biyokimya Laboratuvarı, nilufercelik35@hotmail.com

<sup>3</sup> Yeditepe Üniversitesi, İstanbul, clksgdnz@gmail.com

## KAYNAKLAR

1. Herraiz S, Buigues A, Díaz-García C, Romeu M, Martínez S, Gómez-Seguí I, et al. Fertility rescue and ovarian follicle growth promotion by bone marrow stem cell infusion. *Fertil Steril* 2018; 109:908-18.
2. Fazeli Z, Abedindo A, Omrani MD, Ghaderian SMH. Mesenchymal stem cells (MSCs) therapy for recovery of fertility: a systematic review. *Stem Cell Rev* 2018; 14:1-12.
3. Bhartiya D, Anand S, Patel H, Parte S. Making gametes from alternate sources of stem cells: past, present and future. *Reprod Biol Endocrinol* 2017; 15:1-14.
4. Liu K, Guo L, Zhou Z, Pan M, Yan C. Mesenchymal stem cells transfer mitochondria into cerebral microvasculature and promote recovery from ischemic stroke. *Microvasc Res* 2019; 123:74-80.
5. Celik O, Ak M, Sahin E, Senturk S, Ugur K, Celik S, Celik N, Cengiz F, Muderris İ, Capar M, Sahin İ, Aydin S. Intra-ovarian stem cell transplantation in management of premature ovarian insufficiency: towards the induced Oogonial Stem Cell (iOSC). *Cell Mol Biol (Noisy-le-grand)*. 2020 Apr 20;66(1):114-121.
6. Celik O, Esrefoglu M, Hascalik S, Gul M, Tagluk ME, Elter K, Aydin E. Use of porcine small intestinal submucosa to reconstruct an ovarian defect. *Int J Gynaecol Obstet*. 2009 Sep;106(3):218-22.
7. Panula S, Medrano JV, Kee K, Bergström R, Nguyen HN, Byers B, et al. Human germ cell differentiation from fetal- and adult-derived induced pluripotent stem cells. *Hum Mol Genet* 2011; 20:752-62.
8. Ishikura Y, Yabuta Y, Ohta H, Hayashi K, Nakamura T, Okamoto I, et al. Vitro derivation and propagation of spermatogonial stem cell activity from mouse pluripotent stem cells. *Cell Rep* 2016; 17:2789-2804
9. Howell SJ, Shalet SM. Spermatogenesis After Cancer Treatment: Damage and Recovery. *JNCI Monographs*. 2005;2005(34):12-17.
10. Okada K, Fujisawa M. Recovery of Spermatogenesis Following Cancer Treatment with Cytotoxic Chemotherapy and Radiotherapy. *World J Mens Health*. 2019;37(2):166-174.
11. Radford J. Restoration of fertility after treatment for cancer. *Hormone research*. 2003;59 Suppl 1:21-23.
12. Hermann BP, Sukhwani M, Winkler F, et al. Spermatogonial stem cell transplantation into rhesus testes regenerates spermatogenesis producing functional sperm. *Cell Stem Cell*. 2012;11(5):715-726.
13. Kanatsu-Shinohara M, Takehashi M, Takashima S, et al. Homing of mouse spermatogonial stem cells to germline niche depends on beta1-integrin. *Cell Stem Cell*. 2008;3(5):533-542.
14. Parreira GG, Ogawa T, Avarbock MR, Franca LR, Brinster RL, Russell LD. Development of germ cell transplants in mice. *Biol Reprod*. 1998;59(6):1360-1370.
15. Fayomi AP, Orwig KE: Spermatogonial stem cells and spermatogenesis in mice, monkeys and men. *Stem Cell Res* 2018, 29:207-214. [PubMed: 29730571]
16. Hamer G, de Rooij DG: Mutations causing specific arrests in the development of mouse primordial germ cells and gonocytes. *Biol Reprod* 2018, 99:75-86.