BÖLÜM 38

Kriyoprezervasyon

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GİRİŞ

Kriyoprezervasyon hücrelerin tuz ve düşük moleküler ağırlıklı solüsyonlar içinde, sıfırın altındaki çok düşük sıcaklıklara (genellikle -196°C) kadar dondurulup uzun süre saklandığı, ardından da normal fonksiyonlarını geri kazanmaları için çözdürülüp kullanıldığı bir prosedürdür. "Sıvı nitrojen canlı bir dokuyu birkaç saniyede öldürebildiği gibi, yıllarca belki de yüzyıllarca koruyabilir' fikriyle kriyoprezervasyonun temelleri Luyet ve arkadaşları tarafından 1934 yılında atılmıştır (Luyet ve ark.). Bernstein ve Petropavlovski, 1937'de (Bernstein ve ark.), spermatozoanın kriyoprezervasyonu için gliserolün kriyoprotektif etkilerini göstermiş olsalar da, Polge ve arkadaşları, 1949 yılında kriyoprotektan olarak gliserolü kullanarak spermatozoayı ilk kez donduran araştırmacılar olarak tarihe geçmiştir (Polge ve ark.). Mukerji ve arkadaşları, 8 hücreli klivaj aşamasında olan embriyoyu başarıyla 50 günlük kriyoprezervasyonu takiben transfer etmişler ve dondurulup-çözülen embriyonun transferi ile ilk canlı doğumu 3 Ekim 1978'de bildirmişlerdir (Anand ve ark.). Ancak 25 Temmuz 1978'de ilk IVF bebeğinin doğumundan 2 ay ve 9 gün sonra dondurulmuş bir embriyodan ilk canlı doğumun Steptoe ve Edwards tarafından gerçekleştirildiği kabul edilmektedir (Steptoe ve ark.).

Günümüzde ilerleyen teknoloji ile beraber Yardımlı Üreme Yöntemlerinin (YÜT) uygulandığı sikluslarda kriyoprezervasyon rutin uygulamalar arasında kabul edilmektedir. Özellikle YÜT uygulamalarında kullanılan superovulasyon protokolleri sonrasında çok sayıda oosit ve dolayısıyla

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transfer) vitrifikasyon ve slow freezing karşılaştırıldığında istatistiksel olarak anlamlı bir farklılık göstermemiştir (Rienzi ve ark.). Yedi randomize kontrollü çalışma verilerine göre (Kim ve ark., Rama Raju ve ark., Huang ve ark., Zheng ve ark., Balaban ve ark., Fasano ve ark.,) embriyo sağkalım oranları (3615 klivaj ve blastosist aşaması embriyo) bakımından yapılan kıyaslamada ise, vitrifikasyon sonrası çözülme ile anlamlı oranda embriyo sağ kalım oranlarının yüksek olduğu raporlanmıştır. Buna ek olarak, klivaj aşamasındaki embriyoların (2531 klivaj aşamasındaki embriyo) sağkalım oranlarının slow freezing yöntemi sonrasında anlamlı yüksek olduğu gözlemlenirken, blastosist aşaması embriyolarda (1084 blastosit) vitrifikasyon ve slow freezing karşılaştırıldığında istatistiksel olarak anlamlı bir farklılık göstermemiştir. Kohort çalışmaların (Kuwayama ve ark., 2005, Stehlik ve ark., Liebermann ve ark., Li ve ark., Rezazadeh Valojerdi ve ark., Wilding ve ark., Sifer ve ark., Wang ve ark., Liu ve ark., Van Landuyt ve ark., Zhu ve ark., Summers ve ark.) sonuçlarına göre vitrifikasyon ve slow freezing karşılaştırıldığında totalde 64.982 pronüklear aşama, klivaj aşaması ve blastosist aşamasındaki embriyoların, sağkalım oranlarının vitrifikasyon yöntemi sonrasında anlamlı yüksek olduğu gözlemlenirken, klivaj aşaması ve blastosist aşamasındaki embriyolar vitrifikasyon sonrasında pronüklear aşamaya oranla daha yüksek sağkalım oranlarına sahiptir.

Genel olarak ultra hızlı dondurma yöntemi ile yavaş dondurma yöntemi kıyaslandığında, ultra hızlı dondurma yönteminde kriyoprotektan ajanlara maruziyet süresi azalsada daha yüksek konsantrasyonlarda uygulama gerçekleştirilir. Vitrifikasyon yönteminde kriyoprotektan ajanların konsantrasyonunun yüksek olması, ultra hızlı dondurma yöntemine göre dezavantaj olarak görülsede, klinik gebelik oranlarının vitrifikasyon yönteminde daha yüksek olması, intrasellüler buz kristallerinin oluşmasına engel olması ve cihaz kullanımını gerektirmemesi sebebiyle genel olarak YÜT laboratuvarlarında uygulanan en yaygın yöntemdir.

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