7.
BÖLÜM

Periodontolojide Kök Hücre Tedavisi

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GİRİŞ

Kök hücre, kendini yenileyebilen ve farklılaşmış hücreler oluşturabilen, vücutta çok uzun süre bölünmeye devam eden farklılaşmamış bir hücredir. Başka bir deyişle, farklı hücre tiplerine dönüşebilen ve yenilenebilen hücrelere, kök hücre denir. Kas, karaciğer ve deri hücreleri gibi vücut hücrelerimizin hedefleri açıktır ve bu hücreler bölündüğünde kendileri gibi bir hücre oluştururlar. Ancak kök hücrelerin, bu hücrelerin aksine belirli bir işlevi yoktur. Bu nedenle aldıkları sinyallere göre farklı hücre tiplerine dönüşebilirler. Bu işleme farklılaşma (plastisite) denir. Farklı iç ve dış sinyaller farklılaşmaya yardımcı olur. Dış sinyaller, mikro ortamdaki komşu hücreler ve moleküller ile fiziksel temas, komşu hücreler tarafından salgılanan kimyasallardır. İç sinyaller ise hücre genleridir (1,2).

KÖK HÜCRE ÇEŞİTLERİ

Kök hücreler, farklılaşma özelliklerine göre beş alt gruba ayrılır: Totipotent, pluripotent, multipotent, oligopotent ve unipotent.

Totipotent Hücre: Vücuttaki tüm hücrelere dönüşebilen bir zigot hücresine (sperm ile ovumun birleşmesi ile oluşan embriyonik hücre*)* totipotent hücre (her şeyi yapabilen) denir. Döllenmeden sonraki ilk 4-5 günde bu hücreler aynı kapasiteye sahip hücrelerdir ve her biri kendi başına bir organizma oluşturabilmektedir (1).

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Klinik Zorluklar

Kök hücre bazlı periodontal tedavideki klinik zorluklar, uygulamadan sonra bağışıklık reddi, kök hücrelerin onkojenik özellikleri ve nakledilen dokuların konakçıya fonksiyonel entegrasyonu ile ilgilidir.

Bağışıklık sisteminin nakil sonrasında kök hücrelere veya bunların türevlerine nasıl tepki vereceğini anlamak önemlidir. Genel olarak, bir insan hücresinin immünojenitesi, vücudun kendi hücrelerini yabancı hücrelerden ayırt etmesine izin veren MHC I ve MHC II ekspresyonuna bağlıdır (64). İnsan embriyonik kök hücreleri, düşük seviyede MHC I eksprese eder, ancak bu ekspresyon farklılaşma ile yukarı doğru regüle edilir (65). Bu soruna potansiyel bir çözüm, bağışıklık reddinin üstesinden gelmek için otolog kök hücrelerin kullanımında yatmaktadır. Mezenkimal kök hücrelerin hem in vitro hem de in vivo immünosupresif etkileri ile ilgili son bulgular, donör ve alıcı çapraz eşleştirmeye ihtiyaç duymadan allojenik kök hücrelerin kullanılması olasılığını da artırmıştır (66).

Genomik stabilite ve kök hücre transplantasyonunu takiben tümör oluşumu riski ile ilgili zorluk, önemli güvenlik hususlarıdır, çünkü kültürden, farklılaşmamış embriyonik kök hücrelerini ortadan kaldırmak için güvenilir yöntemler henüz oluşturulmamıştır (67).

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