

## ÇOCUK NÖROLOJİ HASTALARINDA HÜCRE TEMELLİ TEDAVİLER

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### GİRİŞ

Son yıllarda kök hücre tedavileri, çocuk nörolojisi pratiğinde önemli bir tedavi seçeneği olarak öne çıkmaktadır. Kök hücreler, vücuttaki diğer hücre tiplerine dönüşebilme yeteneğine sahip özel hücrelerdir.<sup>1</sup> Bu özellikleri sayesinde, sinir sistemi hastalıklarının tedavisinde umut vaad etmektedir. Kök hücreler, farklı kaynaklardan elde edilebilir. Farklılaşma potansiyellerine göre totipotent, pluripotent, multipotent veya unipotent olarak sınıflandırılabilen kök hücreler embriyo dokularından, mezenkimal hücrelerden elde edilebilir. Ayrıca somatik hücrelerden özel metodlarla indüklenmiş pluripotent kök hücreler (iPKHs) elde edilebilir. Totipotent kök hücreler hem ekstra embriyonik hücrelere (plasenta) hem de embriyo kök hücrelerine dönüşebilen zigotik hücrelerdir.<sup>2</sup> Embriyonik kök hücreler ise pluripotent kök hücrelerdir ve embriyonun üç germ katmanından türetilen farklılaşmış hücre tiplerine dönüşebilme yeteneğine sahiptir.<sup>3</sup> Embriyonik kök hücrelerinin bu sınırsız çoğalma ve başka hücrelere dönüşebilme yeteneği NDH'ların tedavilerinin araştırılmasında ilham kaynağı olmaktadır.<sup>4</sup> İndüklenmiş pluripotent kök hücreler non-pluripotent soma-

tik hücrelerinden türetilen yapay pluripotent kök hücrelerdir.<sup>5</sup> Mezenkimal kök hücreler ise kemik, kıkırdak, yağ, diş, kas ve tendon gibi mezenkimal dokulara dönüşebilen heterojen multipotent kök hücrelerdir ve otolog kök hücre tedavisinin ana kaynağıdır.<sup>6</sup>

Nörolojik hastalıklarda karşılaşılan en büyük sorun; nöron hücre ölümünün engellenememesi ya da sinir sitemindeki nöron hücrelerinin kendi kendini yenileyememesinden kaynaklanmaktadır.<sup>7</sup> Ayrıca, birçok nörolojik hastalıkta kullanılan mevcut tedavi seçenekleri hastalıkların küratif tedavilerinde yetersiz kalmaktadır. Bu nedenle klinisyenler için kök hücre tedavileri umut verici bir seçenek olarak popülerliğini korumaktadır.<sup>8</sup>

İlk başarılı kök hücre tedavisi 1958 yılında George Mathe tarafından allojenik kemik iliği nakli şeklinde lösemi tedavisinde kullanılmış olup günümüze kadar birçok tedaviye öncülük etmiştir. Sonrasında birçok hastalık grubu ve hastada kullanılan kök hücre tedavisi, çocuklarda nörolojik hastalıkların tedavisinde önemli bir rol oynamaya başlamıştır.<sup>9</sup> Özellikle, beyin hasarı, omurilik yaralanmaları, epilepsi, serebral palsi, otizm spektrum bozukluğu, Duchenne Muskuler Distrofi (DMD), Mukopolisakkaridozlar, Amyotrofik La-

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hastaya HKHT uygulandığını ve nakil sonrası hastalığın progresyonunun yavaşladığını belirtmiştir.<sup>108</sup> Metakromatik lökodistrofi, HKHT'nin uygulandığı hastalıklardan bir diğeridir. Günümüzde MLD'de HKHT'nin etkinliğini gösteren faz 1-2 çalışmalar mevcuttur.<sup>84</sup>

Hematopoetik kök hücre nakli, birçok nöro-metabolik hastalığın tedavisinde umut vaat eden tedavi seçenekleri arasında yerini almıştır. İleriye dönük tedaviye ışık tutacak yeni klinik çalışmalarla daha yüzgüldürücü sonuçlar elde edileceğine inanılmaktadır.

## LİMİTASYONLARI

Mezenkimal kök hücrelerinin pre-klinik çalışmalardan klinik çalışmalara etkin bir şekilde dönüşebilmesi için, hücre kültürlerinin uygun zamanda üretilmesi, depolanması ve kişi bazlı uygulanması gerekmektedir. Bunun için ileriye dönük daha çok çalışmaya ihtiyaç duyulmaktadır. Ayrıca pluripotent kök hücre nakli sonrası tümörögenезin aktifleşmesi sonucu oluşabilecek tümörler, kök hücre tedavisinin limitasyonlarından biri olarak kabul edilmektedir.

## SONUÇ

Çocuk nörolojisi pratiğinde kök hücre tedavisi, beynin ve sinir sisteminin iyileştirilmesi açısından büyük bir potansiyele sahiptir. Kök hücre tedavisi multidisipliner bir yaklaşım gerektirir. Hastaların multidisipliner yaklaşımla değerlendirilmesi, tedavi planlamasında ve rehabilitasyon sürecinde en iyi sonuçları elde etmeyi hedefler. Kök hücre tedavilerinin dezavantajları rutin tedavide kullanımlarını kısıtlamaktadır. Etkinliğini arttıracak ve yan etki profilini azaltabilecek yeni metotlarla elde edilen ve uygulanan kök hücre tedavileri çocuklarda nörolojik hastalıkların tedavisinde çığır açabilecek potansiyele sahiptir.

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