Bölüm 5

BÜYÜME FAKTÖRLERİN KEMİK DOKU ÜZERİNE OLAN REJENERATİF ETKİSİ

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GİRİŞ

Kemik gibi vücut dokularının oluşumu ve onarımının önemli olduğu düşünülmektedir ve buna bağlı olarak, araştırmalarda bunları etkileyenönemli faktörler tespit edilerek çok dikkat çekmiştir. Birçok yaşamsal hücre davranışın belirlenmesinde rol oynayan büyüme faktörleri, hücrenin etrafındaki biyolojik ortamda çözülen, hücrenin çekirdeğine (nükleus) sinyal gönderen ve böylece hücrenin davranışını kontrol eden aktif biyomoleküllerdir. Doku rejenerasyonunda, büyüme faktöri hakkında bildiklerimiz, hücre simülasyonunda önemeli yeri olduğunu düşündürmektedir. Bu derlemede, büyüme faktörlerinin kemik defektlerini iyileştirmede rol oynadığını ve aynı zamanda doku rejenerasyonunda ne kadar önem taşıdığını göstermeye çalıştık.

KEMİK HİSTOLOJİSİ

Kemik, insan vücudunun iskeletini oluşturan canlı ve sert bir maddedir ve birçok yerde hassas dokuların etrafını çevreleyerek onları korur. Kemikler, beyaz ve kırmızı kan hücrelerinin üretildiği yerlerdir ve minerallerin, özellikle kalsiyumun kaynağını oluştururlar. Kemik dokusu, özelleşmiş bir bağ doku olarak hücreler ve hücre dışı mineralize olmuş matriksten oluşur ve ayrıca, kemik iliği, endosteum, periosteum, kan damarı, sinir ve kıkırdak gibi başka dokuları da bulundurmaktadır (Ross & Pawlina, 2003). Kollajen kemik matrisinin yaklaşık %90'ını oluşturup ana yapısal bileşeni tip I kollajen ve daha az ölçüde tip V kollajenden meydana gelmektedir (Ross & Pawlina, 2003). Matriks ayrıca, osteokalsin, osteonektin ve osteopontin gibi küçük glikoproteinler, glikozaminoglikanlardan ve birkaç sialoprotein formunda maddelerde içerir. Kolajen I merkezi bir çekirdek üzerinde mineral maddelerin biriktirilmesi ve kireçlenmesi sonucunda hidroksiapatit kristallerinin oluşumunugerçekleştirir (Junqueira & Carneiro, 2009). Kemik dokusu hücreleri üç tiptedir: osteoblast, osteoklast ve osteosit. Osteoblast, çok miktarda

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Sonuç olarak, son birkaç yılda, BMP, PDGF, TGF, VEGF ve FGF gibi büyüme faktörlerinin etkisi üzerindeki araştırmalar büyük dikkat çekmiştir ve bu araştırmalar BMP, PDGF, TGF-β, FGF ve VEGF uygulanmasının kemik doku rejenerasyonunu artırabileceğini gösteren kanıtlar sağlamıştır. Büyüme faktörlerinin kemik dokusunun yenilenmesinde rolünü değerlendirmek için daha fazla çalışmaya ihtiyaç vardır. Ayrıca, farklı büyüme faktör tipleri arasındaki ilişki ve diğer taraftan faktörler ve hücre dışı matris arasındaki ilişki hakkında daha fazla çalışma yapılmalıdır.

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