BÖLÜM 42

OBEZİTEDE OKSİDATİF STRES, OKSİDAN VE ANTİOKSİDAN MEKANİZMALAR

Said ALTIKAT[1]

Dünya Sağlık Örgütü'nün "vücut kitle indeksinin 30'dan büyük olması" olarak tanımladığı obezite olgusu, multifaktöriyel kronik bir hastalıktır.[1] Obezite; sosyokültürel, davranışsal, psikojenik, metabolik, hücresel ve moleküler tüm faktörlerin etkileşimiyle gelişir.[2] Aşırı yağ birikimiyle sonuçlanan, yağ dokusunun hacimsel ve hücresel olarak arttığı bir durum olup "vücut ağırlığındaki aşırı artış" olarak tanımlanabilir. (Resim-1)

Etyopatogenez:

Temel olarak obezite; harcanan enerjiye kıyasla aşırı besin alımı sonucu oluşmaktadır. (Resim-1) Çocuklarda artan yağ ve şeker tüketimi ve fiziksel aktivite eksikliği obezite ile direkt ilişkilendirilmiştir.[1] Obezitenin birkaç temel etyopatogenezinden bahsedilebilir; birincisi, bazı popülâsyonlarda yağ deposunun aşırı artışını genetik olarak kodlayan genlerin varlığı. Bir diğeri ise "tasarruflu gen teorisi"dir, ki bu uzun süreli açlıkta "idame-i hayat"ı sağlar. Ama mevcut koşullar altında bu genetik yatkınlık, aşırı yağ stoku, obezite ve sonuçta Tip 2 Diabetes Mellitusla sona erer.1 Ayrıca "Fetal Köken Hipotezi" denilen, zayıf maternal beslenme sonucu oluşan zayıf fetal büyümenin; vücut yapısını, fizyolojisi ve metabolizması ve bunun programlanmasını etkileyerek, kronik hastalıkların gelişimi için risk faktörlerinin yapısal hale geçmesi denilen teorinin varsayımıdır.[3] Bunun dışında beslenme ve yaşam tarzı, gıda içeriğindeki değişiklikler de obezite prevalansında artışa neden olmuştur.[4] Obezite oluşumundaki diğer önemli bir kuram ise; normalde merkezi sinir sisteminin sinyaller aracılığıyla düzenlediği iştah, enerji sarfiyatı ve kilo alımı mekanizmasının; obezite hastalığı durumlarında, bozulması düşüncesidir.1(Resim-3)

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Sonuç İtibariyle:

Yağ dokusu; salgıladığı maddeler bakımından bazı önemli biyolojik fonksiyonların gerçekleşmesi için gerekli ve organizma için büyük önem taşıyan bir salgı organıdır. Obezite, yağ dokusunun aşırı depolanması ile karakterize olduğunda, adipokin sekresyonu artmaktadır ve leptinde olduğu gibi etkisine karşı direnç oluşturulabilir. Adipokinlere ek olarak, NO'nun yetersiz üretimi, progresif yağ birikimi ve sonunda diğer patolojilerin gelişmesiyle birlikte hücresel yapılara zarar veren ve tetikleyen aşırı ROS üretimini doğurmaktadır. Bu nedenle kiloya yansıyan vücut yağındaki azalma; oksidasyon belirteçlerinin iyileşmesine ve obezite ile bozulan antioksidan aktivitenin artmasına neden olur.[5]

Ayrıca Antioksidan savunma genlerindeki ve ayrıca ROS oluşumunda rol alan enzimlerin genlerindeki genetik varyantların incelenmesi, antioksidan savunmaların obeziteye ve bunun türetilmiş metabolik komplikasyonlarına karşı korunmadaki rolünün daha iyi anlaşılmasına yardımcı olabilir. ROS süpürme sistemlerindeki denge bozuklukları ya da hücrelerde artmış oksidatif stres üretimi nedeniyle obezitede; artmış ROS üretimi mevcuttur. Bu etkiler, aşırı kalori alımı ve elektron taşıma zincirinin doygunluğunun yanı sıra, obezitenin özelliği olan değişmiş insülin veya sitokin üretimine yanıt olarak NADPH oksidaz kompleksi gibi hücresel sistemlerden serbest radikal oluşumuna bağlı olabilir. Bununla birlikte, ROS'un bizzat adipogenezi artırarak obezite oluşturduğunu söyleyen yazarlar da vardır. Gerçek muhtemelen bu fenomenlerin bir karışımı olsa da ROS'un obezitenin gelişiminin erken aşamalarında ve insülin direnci gibi metabolik değişikliklerinin rolünü tanımlamak için daha fazla çalışma yapılması gerekmektedir.[159]

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