BÖLÜM 11

HİPOKSİK BEYİN HASARINDA AKUT YAKLAŞIM

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Beyin yüksek metabolik ihtiyaçları, enerji depolarının yetersiz olması, yüksek oranda ekzojen substratlara (oksijen ve glukoz) ihtiyaç duyması nedeni ile hipoksi ve iskemiye oldukça duyarlıdır.[1,2] Hipoksik İskemik Ensefalopati bozulma iskemi ve/veya hipoksi sırasında ve sonrasında ortaya çıkabilen, beyin fonksiyonlarında bozulma ile giden, mortalite ve nörolojik morbiditesi yüksek olan bir durumdur.[3,4,5]

FİZYOPATOLOJİ

Fizyopatoloji mekanizmaları ve prognoz etiyolojiye göre değişir.[2,6] HİE'de etiyolojiden bağımsız olan mekanizma iskemi (beyin kan akımının azalması) ve hipoksidir (kanda oksijen miktarının az olması).[3] Tek başına akut olarak oksijenlenmenin azaldığı durumlar (akut anemi, şiddetli astım, orak hücreli anemi, yüksek rakımda yaşamak, sigara dumanı inhalasyonu, karbonmonoksit zehirlenmesi) ile kardiyak arrest sonrası gelişen iskemide fizyopatoloji mekanizmaları birbirinden farklıdır. Hipoksi-de karbondioksit yükselir, pH düşer buna bağlı olarak vazodilatasyon olur ve serebral kan akımı artar. Sistemik dolaşım devam ettiği için hücreye metabolit ve oksijen sunumu ile toksik metabolitlerin temizlenmesi devam eder. Respiratuar arrest sonrasında eğer kardiyak arrest gelişmez ise beyin dokusunda gelişen hasar primer iskemiye göre daha az ve geçici olabilir. Respiratuar arrest sonrası HİE'de iyileşme ve nörolojik prognozun iyi olma şansı kardiyak arreste bağlı HİE'den daha yüksektir.[2] Ancak solunum yetmezliği, uzun sürer ise hipoksi ve asidoza bağlı olarak bradiaritmi ve asistoliye neden olabilir.[7] İskemide tek başına hipoksiden farklı olarak beyne hem oksijen hem de metabolit sunumu azalır.[2] Postkardiyak arrest sendromu ise şiddetli hipoksi sonrasında beyin hasarı, miyokardiyal disfonksiyon, iskemi ve reperfüzyon hasarından oluşan bir durumdur.[1,8]

KARDİYAK ARREST

Kardiyak arrest etiyoloji, altta yatan nedenler, süre ve prognozun farklı olması nedeni ile hastane içi kardiyak arrest ve hastane dışı kardiyak arrest olarak iki grupta incelenir.[6] Hastane dışı kardiyak arrest sıklığı çocuklarda (100.000 de 4.2-19,7) erişkinlerden (100.000 de 36-128)

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Kraniyal Görüntüleme

BBT'de erken dönemde gri beyaz cevher ayrımının kaybolması, ventriküler sisternlerde genişleme olması, MRG'de kortekste ve geniş alanda difüzyon kısıtlaması, korteks, beyin sapı ve bazal ganglionlarda sinyal artışı, MRG-S'de laktatın yükselirken N-asetil aspartatın azalması kötü prognoz göstergeleridir.[3,7,54,96] MRG'de beyin ödemi ve özellikle bazal ganglionlar bölgesin etkilendiğinin görülmesi kötü prognoz göstergesidir.[95] HİE'de klinik, görüntüleme ve elektrofizyolojik prognoz kriterleri Tablo 2'de gösterilmiştir.

Prognoz değerlendirilmesinde klinik, görüntüleme ve elektofizyolojik çalışmaların tek başlarına veya erken dönemde yapılmaları yanıltıcı olabilirler, bu nedenle birlikte ve seri olarak yapılmaları gerekmektedir.[7,54]

HİE fizyopatoloji mekanizmalarını anlamaya başladıkça, toplum genelinde resüsitasyon eğitim programları, resüsitasyon tekniklerinde ilerlemeler ve tedavideki ilerlemeler (hipotermi, nöroprotektif tedavi, intrakraniyal basıncın izlem ve tedavisi) ile birlikte prognoz geçmişe göre daha iyidir.[1] Ancak mevcut tedaviler devam eden hasarı önlemede yetersiz kalmaktadır. HİE'ye neden olan olaydan sonraki saatler içinde gelişen hasarı ve sonradan gelişen nörolojik hasarı engellemek için serebral kan akımının devam ettirilmesi (hemodilüsyon, endotelin A antagonisitleri, remifentanil, nitrik oksit ve nitrik oksit artışını sağlayan tedaviler), antieksitotoksik (barbitürat, N-Metil-D-Aspartat (NMDA) ve α-amino-3-hidroksi-5-metiloksol-4-propiyonik asit reseptörlerine yönelik tedaviler), enerji metabolizmasını düzenleyici (keton verilmesi), antiapopitotik (kaspaz inhibitörleri), rejenerasyon ve tamir mekanizması (eritropoetin) üzerinde etkili olabilecek yeni tedavi yöntemleri ile ilgili deneysel çalışmalar devam etmektedir.[61]

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