Obesity in traumatic brain injury

Obesity is associated with chronic inflammation, which may impact recovery from mild traumatic brain injury (mTBI). The objective was to assess the role of obesity in recovery of symptoms, functional outcome and inflammatory blood biomarkers after mTBI.

TRACK-TBI is a prospective study of patients with acute mTBI (Glasgow Coma Scale=13-15) who were enrolled ≤24 hours of injury at an emergency department of level 1 trauma centres and followed for 12 months. A total of 770 hospitalised patients who were either obese (body mass index (BMI) >30.0) or healthy mass (BMI=18.5-24.9) were enrolled. Blood concentrations of high-sensitivity C reactive protein (hsCRP), interleukin (IL) 6, IL-10, tumour necrosis factor alpha; Rivermead Post-Concussion Symptoms Questionnaire (RPQ), Quality of Life After Brain Injury and Glasgow Outcome Score-Extended reflecting injury-related functional limitations at 6 and 12 months were collected.

After adjusting for age and gender, obese participants had higher concentrations of hsCRP 1 day after injury (mean difference (MD)=0.65; 95% CI: 0.44 to 0.87, p<0.001), at 2 weeks (MD=0.99; 95% CI: 0.74 to 1.25, p<0.001) and at 6 months (MD=1.08; 95% CI: 0.79 to 1.37, p<0.001) compared with healthy mass participants. Obese participants had higher concentrations of IL-6 at 2 weeks (MD=0.37; 95% CI: 0.11 to 0.64, p=0.006) and 6 months (MD=0.42; 95% CI: 0.12 to 0.72, p=0.006). Obese participants had higher RPQ total score at 6 months (MD=2.79; p=0.02) and 12 months (MD=2.37; p=0.049).

Obesity is associated with higher symptomatology at 6 and 12 months and higher concentrations of blood inflammatory markers throughout recovery following mTBI [1)].

1)
Eagle SR, Puccio AM, Nelson LD, McCrea M, Giacino J, Diaz-Arrastia R, Conkright W, Jain S, Sun X, Manley G, Okonkwo DO; TRACK-TBI Investigators. Association of obesity with mild traumatic brain injury symptoms, inflammatory profile, quality of life and functional outcomes: a TRACK-TBI Study. J Neurol Neurosurg Psychiatry. 2023 Jun 27:jnnp-2023-331562. doi: 10.1136/jnnp-2023-331562. Epub ahead of print. PMID: 37369556.