Enolase (NSE), cleaved-Tau (c-Tau) and Glial fibrillary acidic protein (GFAP). The primary outcome measure was the presence of persistent symptoms at 90 days after mTBI, as assessed using the Rivermead Post-Concussion symptoms Questionnaire (RPQ). A ROC curve was constructed for each biomarker. **Results:** 1276 patients were included in the study. The median age for this cohort was 39 (IQR 23-57) years old, 61% were male and 15% suffered PPCS. The median values (IQR) for patients with PPCS compared to those without were: 43 pg/mL (26-67) versus 42 pg/mL (24-70) for S100B protein, 50 pg/mL (50-223) versus 50 pg/mL (50-199) for NSE, 2929 pg/mL (1733-4744) versus 3180 pg/mL (1835-4761) for c-Tau and 1644 pg/mL (650-3215) versus 1894 pg/mL (700-3498) for GFAP. For each of these biomarkers, Areas Under the Curve (AUC) were 0.495, 0.495, 0.51 and 0.54, respectively. **Conclusion:** Among mTBI patients, S100B protein, NSE, c-Tau or GFAP during the first 24 hours after trauma do not seem to be able to predict PPCS. Future research testing of other biomarkers is needed in order to determine their usefulness in predicting PPCS when combined with relevant clinical data.

**Keywords:** biomarkers, mild traumatic brain injury, persistent post-concussion symptoms

**LO87**

**Influence of co-injuries on post-concussion symptoms after a mild traumatic brain injury**

V. Ouellet, V. Boucher, MSc, F. Beauchamp, X. Neveu, MSc, P. Archambault, MD, MSc, S. Berthelot, MD, MSc, J. Chauny, MD, MSc, E. de Guise, PhD, M. Émond, MD, MSc, J. Frenette, PhD, E. Lang, MD, MSc, J. Lee, MD, MSc, É. Mercier, MD, MSc, L. Moore, PhD, M. Ouellet, PhD, J. Perry, MD, MSc, N. Le Sage, MD, PhD, Université Laval, Quebec City, QC

**Introduction:** Each year, 3/1000 Canadians sustain a mild traumatic brain injury (mTBI). Many of those mTBI are accompanied by various co-injuries such as dislocations, sprains, fractures or internal injuries. A number of those patients, with or without co-injuries will suffer from persistent post-concussive symptoms (PPCS) more than 90 days post injury. However, little is known about the impact of co-injuries on mTBI outcome. This study aims to describe the impact of co-injuries on PPCS and on patient return to normal activities. **Methods:** This multicenter prospective cohort study took place in seven large Canadian Emergency Departments (ED). Inclusion criteria: patients aged ≥ 14 who had a documented mTBI that occurred within 24 hours of ED visit, with a Glasgow Coma Scale score of 13-15. Patients who were admitted following their ED visit or unable to consent were excluded. Clinical and sociodemographic information was collected during the initial ED visit. A research nurse then conducted three follow-up phone interviews at 7, 30 and 90 days post-injury, in which they assessed symptom evolution using the validated Rivermead Post-concussion Symptoms Questionnaire (RPQ). Adjusted risk ratios (RR) were calculated to estimate the influence of co-injuries. **Results:** A total of 1674 patients were included, of which 1023 (61.1%) had at least one co-injury. At 90 days, patients with co-injuries seemed to be at higher risk of having 3 symptoms ≥2 points according to the RPQ (RR: 1.28 95% CI 1.02-1.61) and of experiencing the following symptoms: dizziness (RR: 1.50 95% CI 1.03-2.20), fatigue (RR: 1.35 95% CI 1.05-1.74), headaches (RR: 1.53 95% CI 1.10-2.13), taking longer to think (RR: 1.50 95% CI 1.07-2.11) and feeling frustrated (RR: 1.45 95% CI 1.01-2.07). We also observed that patients with co-injuries were at higher risk of non-return to their normal activities (RR: 2.31 95% CI 1.37-3.90). **Conclusion:** Patients with co-injuries could be at higher risk of suffering from specific symptoms at 90 days post-injury and to be unable to return to normal activities 90 days post-injury. A better understanding of the impact of co-injuries on mTBI could improve patient management. However, further research is needed to determine if the differences shown in this study are due to the impact of co-injuries on mTBI recovery or to the co-injuries themselves.

**Keywords:** co-injuries, mild traumatic brain injury, post-concussion syndrome

**LO88**

**S100B serum protein level for the detection of clinically significant intracranial hemorrhage in patients with mild traumatic brain injury: a prospective cohort study**

J. Blais-L'Écuyer, MD, J. Blais-L'Écuyer, MD, É. Mercier, MD, MSc, P. Tardif, MSc, P. Archambault, MD, MSc, J. Chauny, MD, MSc, S. Berthelot, MD, MSc, J. Frenette, PhD, J. Perry, MD, MSc, I. Stiell, MD, MSc, M. Émond, MD, MSc, J. Lee, MD, MSc, E. Lang, MD, MSc, A. McRae, MD, MSc, V. Boucher, MSc, N. Le Sage, MD, PhD, Université Laval, Quebec City, QC

**Introduction:** Clinical assessment of patients with mTBI is challenging and overuse of head CT in the emergency department (ED) is a major problem. During the last decades, studies have attempted to reduce unnecessary head CTs following a mTBI by identifying new tools aiming to predict intracranial bleeding. S100B serum protein level might be helpful reducing those imaging since a higher level of S-100B protein has been associated with intracranial hemorrhage following a mTBI in previous literature. The main objective of this study was to assess whether the S100B serum protein level is associated with clinically important brain injury and could be used to reduce the number of head CT following a mTBI. **Methods:** This prospective multicenter cohort study was conducted in five Canadian ED. MTBI patients with a Glasgow Coma Scale (GCS) score of 13-15 in the ED and a blood sample drawn within 24-hours after the injury were included. S-100B protein was analyzed using enzyme-linked immunosorbent assay (ELISA). All types of intracranial bleedings were reviewed by a radiologist who was blinded to the biomarker results. The main outcome was the presence of clinically important brain injury. **Results:** A total of 476 patients were included. Mean age was 41 ± 18 years old and 150 (31.5%) were female. Twenty-four (5.0%) patients had a clinically significant intracranial hemorrhage while 37 (7.8%) had any type of intracranial bleeding. S100B median value (Q1-Q3) of was: 0.043 ug/L (0.008-0.080) for patients with clinically important brain injury versus 0.039 µg/L (0.023-0.059) for patients without clinically important brain injury. Sensitivity and specificity of the S100B protein level, if used alone to detect clinically important brain injury, were 16.7% (95% CI 4.7-37.4) and 88.5% (95% CI 85.2-91.3), respectively. **Conclusion:** S100B serum protein level was not associated with clinically significant intracranial hemorrhage in mTBI patients. This protein did not appear to be useful to reduce the number of CT prescribed in the ED and would have missed many clinically important brain injuries. Future research should focus on different ways to assess mTBI patient and ultimately reduce unnecessary head CT.

**Keywords:** biomarker, head computed tomography, mild traumatic brain injury



https://doi.org/10.1017/cem.2020.142 Published online by Cambridge University Press