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

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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

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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

LO89
Describing the evolution of post-concussion symptoms after sports-related mTBI

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Introduction: Mild traumatic brain injury (mTBI) is a serious public health issue and as much as one third of mTBI patients could be affected by persistent post-concussion symptoms (PPCS) three months after their injury. Even though a significant proportion of all mTBIs are sports-related (SR), little is known on the recovery process of SR mTBI patients and the potential differences between SR mTBI and patients who suffered non-sports-related mTBI. The objective of this study was to describe the evolution of PPCS among patients who sustained a SR mTBI compared to those who sustained non sport-related mTBI. **Methods:** This Canadian multicenter prospective cohort study included patients aged ≥ 14 who had a documented mTBI that occurred within 24 hours of Emergency Department (ED) visit, with a Glasgow Coma Scale score of 13-15. Patients who were hospitalized following their ED visit or unable to consent were excluded. Clinical and sociodemographic information was collected during the initial ED visit. Three follow-up phone interviews were conducted by a research nurse at 7, 30 and 90 days post-injury to assess symptom evolution using the validated Rivermead Post-concussion Symptoms Questionnaire (RPQ). Adjusted risk ratios (RR) were calculated to demonstrate the impact of the mechanism of injury (sports vs non-sports) on the presence and severity of PPCS. **Results:** A total of 1676 mTBI patients were included, 358 (21.4%) of which sustained a SR mTBI. At 90 days post-injury, patients who suffered a SR mTBI seemed to be significantly less affected by fatigue (RR: 0.70 (95% CI: 0.50-0.97)) and irritability (RR: 0.60 (95% CI: 0.38-0.94)). However, no difference was observed between the two groups regarding each other symptom evaluated in the RPQ. Moreover, the proportion of patients with three symptoms or more, a score ≥21 on the RPQ and those who did return to their normal activities were also comparable. **Conclusion:** Although persistent post-concussion symptoms are slightly different depending on the mechanism of trauma, our results show that patients who sustained SR-mTBI could be at lower risk of experiencing some types of symptoms 90 days post-injury, in particular, fatigue and irritability.
Keywords: mild traumatic brain injury, post-concussion symptoms, sports-related injury

LO90
Predictors of post-concussion syndrome in adults with acute mild traumatic brain injury presenting to the emergency department: a secondary analysis of a randomized controlled trial

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Introduction: The emergency department (ED) is the first point of health care contact for most head injured patients. Although early and spontaneous resolution occurs in most patients with mild traumatic brain injury (MTBI), between 15-30% develop post-concussion syndrome (PCS). To date, clinical prediction tools do not yet exist to accurately identify adult MTBI patients at risk of PCS. The objective of this study was to identify predictors of PCS within 30 days in adults with acute MTBI presenting to the ED. **Methods:** This was a secondary analysis of a randomized controlled trial conducted in three Canadian EDs evaluating prescribed light exercise compared to standard care. Adult (18-64 years) patients with a MTBI sustained within the preceding 48 hours were eligible for enrollment. Participants completed follow-up questionnaires at 7, 14, and 30 days. The primary outcome was the presence of PCS at 30 days, defined as the presence of ≥ 3 symptoms on the Rivermead Post-concussion Symptoms Questionnaire (RPQ) at 30 days. Backward, stepwise, multivariable logistic regression with a removal criterion probability of 0.05 was conducted to determine predictor variables independently associated with PCS at 30 days. Likelihood ratio tests were used to determine appropriate inclusion of variables in the multivariable model. Results are reported as odds ratios (OR) with 95% confidence intervals (CIs). **Results:** A total of 367 patients were enrolled, 18 (4.9%) withdrew, and 108 (29.4%) were lost to follow-up. Median (IQR) age was 32 (25 to 48) years, and 201 (57.6%) were female. Of the 241 patients who completed follow-up, 49 (20.3%) had PCS at 30 days. Headache at ED presentation (OR = 6.59; 95% CI: 1.31 to 33.11), being under the influence of drugs or alcohol at the time of injury (OR = 4.42; 95% CI: 1.31 to 14.88), the injury occurring via bike or motor vehicle collision (OR = 2.98; 95% CI: 1.39 to 6.40), history of anxiety or depression (OR = 2.49; 95% CI: 1.23 to 5.03), and the sensation of numbness or tingling at ED presentation (OR = 2.25; 95% CI: 1.04 to 4.88), were independently associated with PCS at 30 days. **Conclusion:** Five variables were found to be significant predictors of PCS. Although MTBI is a self-limited condition in the majority of patients, patients with these risk factors should be considered high risk and flagged for early follow-up. There continues to be an urgent need for a clinical prognostic tool that accurately identifies adult patients at risk for PCS early in their injury.
Keywords: concussion, mild traumatic brain injury, post-concussion syndrome

LO91
Opioid poisoning and opioid use disorder in older trauma patients

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Introduction: Patients hospitalized following a trauma will be frequently treated with opioids during their stay and after discharge. We examined the relationship between acute phase (< 3 months) opioid use after discharge and the risk of opioid poisoning (OP) or opioid use disorder (OUD) in older trauma patients **Methods:** In a retrospective multicenter cohort study conducted on registry data, we included all patients aged 65 years and older admitted (hospital stay >2 days) for injury in 57 trauma centers in the province of Quebec (Canada) between 2004 and 2014. We searched for OP and OUD from ICD-9 and ICD-10 code diagnosis that resulted in a hospitalization or a medical consultation after their initial injury. Patients that filled an opioid prescription within a 3-month period after sustaining the trauma were compared to those who did not fill an opioid prescription during that period using Cox proportional hazards regressions. **Results:** A total of 70,314 participants were retained for analysis; median age was 82 years (IQR: 75-87), 68% were women, and 34% of the patients filled an opioid prescription within 3-months of the