

**Prehospital risk factors of mortality and impaired consciousness after severe traumatic brain injury: an epidemiological study.**

**Tohme S, Delhumeau C, Zuercher M, Haller G, Walder B**

**BACKGROUND:** Severe traumatic brain injury (TBI) is a significant health concern and a major burden for society. The period between trauma event and hospital admission in an emergency department (ED) could be a determinant for secondary brain injury and early survival. The aim was to investigate the relationship between prehospital factors associated with secondary brain injury (arterial hypotension, hypoxemia, hypothermia) and the outcomes of mortality and impaired consciousness of survivors at 14 days.

**METHODS:** A multicenter, prospective cohort study was performed in dedicated trauma centres of Switzerland. Adults with severe TBI (Abbreviated Injury Scale score of head region (HAIS) >3) were included. Main outcome measures were death and impaired consciousness (Glasgow Coma Scale (GCS) ≤13) at 14 days. The associations between risk factors and outcome were assessed with univariate and multivariate regression models.

**RESULTS:** 589 patients were included, median age was 55 years (IQR 33, 70). The median GCS in ED was 4 (IQR 3-14), with abnormal pupil reaction in 167 patients (29.2%). Median ISS was 25 (IQR 21, 34). Three hundred seven patients sustained their TBI from falls (52.1%) and 190 from a road traffic accidents (32.3%). Median time from Out-of-hospital Emergency Medical Service (OHEMS) departure on scene to arrival in ED was 50 minutes (IQR 37-72); 451 patients had a direct admission (76.6%). Prehospital hypotension was observed in 24 (4.1%) patients, hypoxemia in 73 (12.6%) patients and hypothermia in 146 (24.8%). Prehospital hypotension and hypothermia (apart of age and trauma severity) was associated with mortality. Prehospital hypoxemia (apart of trauma severity) was associated with impaired consciousness; indirect admission was a protective factor.

**CONCLUSION:** Mortality and impaired consciousness at 14 days do not have the same prehospital risk factors; prehospital hypotension and hypothermia is associated with mortality, and prehospital hypoxemia with impaired consciousness.