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Characteristics and outcomes of elderly traumatic brain injured patients admitted to ICU. Data from Center-TBI

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INTRODUCTION. The epidemiology of traumatic brain injury (TBI) is rapidly changing, with an increasing number of old and fragile patients. The aim of this study is to describe the characteristics of elderly TBI and the effect of age on patients' outcome.

METHODS. The CENTER-TBI (clinicaltrials.gov registration NCT02210221) is a prospective observational longitudinal cohort study including patients with TBI from centers across Europe. Data were extracted from the CENTER-TBI database v1.1 with Neurobot v2.6. Inclusion criteria were:

- diagnosis of TBI, with indication for Computed Tomography (CT),
- presentation to study center within 24 hours of injury.
- ICU stay >72h.

We excluded patients discharged alive from the ICU in < 72 hrs. Patients aged ≥65 were classified as elderly.

RESULTS. A total of 4509 patients were included in the CENTER-TBI study, 2138 were admitted in the ICU and we focused on the 1488 fulfilling the inclusion criteria. Overall, mean age was 48.3 years (sd = 20.37) and 395 patients (26.5%) were considered elderly. Elderly patients presented significant differences ($p < 0.001$) with respect to not elderly both in the admission characteristics and in the discharge status:

- higher incidental fall rate (59% vs 32.9%), mainly at home (43.3% vs 17.3%)
- higher morbidities, as cardiovascular history (70% vs 13.4%), or pulmonary disease (13.8% vs 8.6%)
- higher use of anticoagulants (20.6% vs 1.3%) and antiplatelet (27.6% vs 3.9%)
- higher Glasgow Coma Score at admission (GCS higher than 13: 24.8% vs 15.5%)
- higher non-evacuated mass lesion (Marsh score 6 in 54.3% vs 31.1%)
- more frequent subdural hemorrhage (73.3% vs 51.8%)
- less Intracranial pressure monitoring (ICP 46.7% vs 63.9%)
- less days in ICU (8 days vs 12 days, in median)
- higher mortality in ICU (32.7% vs 13.2%) and at 6 months (52.7% vs 18.6%)
- more unfavorable status (GOSE ≤4: 79.2% vs 46.2%) but similar severe disability (lower or upper) at 6 months (26.5% vs 27.6% $p = 0.728$)

No statistically significant differences according to age were shown in pre-hospital hypotension (14.7% vs 17.3%, $p = 0.285$), hypoxia (13.2% vs 17.7%, $p = 0.052$) and also in the discharge location (in both cases, general ward was the most common 50.7% vs 48.8%, $p = 0.599$).

CONCLUSION. Elderly patients have more comorbidities, different mechanism of injury, more severe CT scan findings, and have a higher mortality when compared to the younger population.

REFERENCE

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Acute kidney injury in traumatic brain injured patients: results from the CENTER TBI study

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INTRODUCTION. Acute kidney injury (AKI) is frequent in polytrauma patients and it is associated with increased mortality, hospital stay, and morbidity. However, the real prevalence and impact on the outcome of AKI in isolated traumatic brain injury (TBI) are unclear. Our aims were

1. to assess the incidence and timing of AKI in a large cohort of prospectively enrolled TBI,
2. to assess in-hospital factors related to AKI development;
3. to assess the association between AKI at different stages and patients' outcome.

METHODS. The CENTER-TBI is a prospective observational longitudinal cohort study including patients with TBI from centers across Europe. Data were extracted from the CENTER-TBI database v1.1 with Neurobot v2.6.

Inclusion criteria for our study were ICU length of stay >72 h and > two creatinine values or at least one urine output (UO) available measures during the ICU stay.

AKI was defined by applying the RIFLE criteria.

RESULTS. 4509 patients were included in the CENTER-TBI study, of which 2138 were admitted to the ICU. 1317 fulfilled the inclusion criteria. Patients were grouped in three categories: normal renal function (N), risk or injury (R/I) and failure (F). The median age in the 3 groups was similar (around 50 y/o). The majority of AKI occurred within the first 10 days from admission, with a median of 2 days (IQR: 1-4 days) for the R/I category, and a median of 4 days (IQR: 1-6 days) for the F group. Patients with history of cardiovascular (CV) disease had a higher occurrence of both R/I and F ($F = 45\%$, $R/I = 31\%$ vs $N = 25.5\%$, $p = 0.003$). During the ICU stay, patients in both the R/I and in the F group suffered more from: episodes of neuroworsening ($F = 45\%$, $R/I = 43\%$ vs $N = 30\%$, $p < 0.001$), raised ICP ($F = 34\%$, $R/I = 39\%$ vs $N = 27\%$, $p = 0.003$), respiratory failure ($F = 40\%$, $R/I = 44\%$ vs $N = 29\%$, $p < 0.001$) and pulmonary edema ($F = 2\%$, $R/I = 6\%$ vs $N = 1\%$, $p < 0.001$). Unsurprisingly, patients in the F group underwent more renal replacement therapy ($F = 27\%$ vs $R/I = 3.5\%$, $N = 2\%$, $p < 0.001$).