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Prevalence and timing of tracheostomy in traumatic brain injured patients: a secondary analysis from the CENTER-TBI study

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Intensive Care Medicine Experimental 2019, **7(Suppl 3):**000594

INTRODUCTION. In traumatic brain injured (TBI), tracheostomy can facilitate the weaning process and can potentially result in fewer days in the intensive care unit (ICU). However, the optimal timing for tracheostomy placement remains uncertain. The aims of our study are to describe the prevalence and timing for tracheostomy in TBI patients and its effects on patients' outcome.
METHODS. The CENTER-TBI study (clinicaltrials.gov registration NCT02210221) is a prospective observational longitudinal cohort study including patients with TBI from 65 centers across Europe. Data were extracted from the CENTER-TBI database v1.1 with Neurobot v2.6. We focused on patients with an ICU stay >72h. Tracheostomy was defined as early (≤7 days from admission) or late (>7).
RESULTS. 4509 patients were included in the CENTER-TBI study, 2138 were admitted to the ICU and we focused on 1361 patients fulfilling the inclusion criteria. Of these, 436 (32%) had a tracheostomy after a median of 12 days (IQR=6-20 days). Patients who underwent tracheostomy had a more severe TBI (71.5% vs 52.7%, p<0.001) and more frequent episodes of prehospital hypoxia (19.6 vs 13%, p=0.003) and hypotension (21 vs 12.2%, p<0.001), as well as a higher number of extracranial injuries, in particular thoracic trauma (47.7% vs 36.6%, p<0.001).
The decision for late (58%) or early (42%) tracheostomy was strongly influenced by country and treating center (p<0.001). Respiratory failure (52 vs 41%, p=0.029) and ventilator associated pneumonia (40 vs 26.5%, p=0.006) were more common in patients who underwent late tracheostomy. Tracheostomy was associated with longer ICU length of stay (median 24 vs 15 days, p<0.001) and duration of mechanical ventilation (median 19 vs 12 days, p<0.001). Effect on ICU mortality (4.3 vs 7.1%, p=0.302) or 6 months neurological outcome (GOSE ≤ 4: 64.2 vs 68.4%, p=0.44) was not significant.
CONCLUSION. Tracheostomy is commonly performed after TBI. Tracheostomy policies are center dependent and are more frequent in more severe TBI and in patients with respiratory complications. The timing for tracheostomy seems to have effect on ICU length of stay and duration of mechanical ventilation, but no effect on patients' outcome.

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1. CENTER-TBI (clinicaltrials.gov NCT02210221) was supported by the European Union 7th Framework program (EC grant 602150).

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Continuous EEG in critical patients with acute cerebral damage. Markers to guide monitoring

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Intensive Care Medicine Experimental 2019, **7(Suppl 3):**000622

INTRODUCTION. Seizures are common entities in patients with acute brain damage which cast their prognosis. **Continuous EEG** has become a tool of increasing use for its detection but it implies an infrastructure and costs that make necessary more data that allow us to identify high risk patient who benefit most from this monitoring, making its use profitable.
OBJECTIVES. To study the **prevalence** of seizures as well as the **morbidity** and **mortality** associated with them in patients with acute brain damage. To study the relationship between the presence of seizures and different clinical and electroencephalographic variables in order to find **predictive factors** that guide us in our clinical practice.
METHODS. It is a **cross-sectional study** in 74 patients **(n = 74)** admitted to ICU with diagnosis of acute brain damage and subjected to study by continuous EEG in the period between **2015-2018**. It has been carried out a descriptive analysis of **prevalence,** main characteristics and **morbimortality** of seizures. Likewise, it has been measured the **association** of seizures with different **clinical** (sex, age, etiology, history of epilepsy, presence of clinical crises, anti-epileptic prophylaxis) and **electroencephalographic variables**(presence of periodic discharges, irritating activity and rhythmic patterns).For this purpose,-descriptive statisticians,Chi-square Test,exact Fisher Test and correlation of Spearman and Pearson have been used, with a statistical significance level p > 0.05.
RESULTS. Seizures were observed in **59%** of the analyzed patients, 77% of whom presented as an epileptic status. The average **time to the onset** of seizures is **17.9 hours** and the average **time of crisis control** is **51.8** hours. An average of **two drugs** per patient was necessary for the control of seizures, being the **most frequently used** the **Levetiracetam** (73%). Patients who present seizures had a **worse functional prognosis** at the time of hospital discharge, with a score between 4 and 6 in the Rankin scale in 80% of the cases and a significantly **higher** both **intrahospital** (48% vs 17%) **and 6-month mortality** (50% vs 20%) (p < 0.05, OR = 4 (1.4-11.7)). With regard to the presence of possible **predictor factors** we have found that seizures **prevalence** is **greater** in patients with **higher age** (Average age: 62 years vs. 53 years) or with a history of **clinical seizures** (84% vs 47%)(p = 0,002 OR 5.9) and **lower** in those who have received **anti-epileptic prophylaxis** (43% vs 70%) (P = 0.02 OR 0.32). It is worth highlighting the increased risk of seizures in patients with **periodic discharges**, considering it as the **main electroencephalographic marker**. The presence of seizures is greater when the discharges are widespread (GPLDs) and it increases proportionally to the frequency with which these periodic discharges appear.
CONCLUSION. Epileptic seizures are a common entity in patients with acute brain damage associated with an important morbimortality so that it is important their early detection and treatment. Given the average time of onset of seizures, we think that continuous EEG is a very useful tool because of its greater sensitivity but its high costs make us neccessary to guide by markers that allow to select high-risk patients. In this sense, the upper ages, the presence of clinical seizures, the absence of prophylaxis or the appearance of electroencephalographic patterns such as periodic discharges seem to have an important predictive value.

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