Methods: A retrospective cohort of consecutive patients treated for ES-related traumatic brain injuries in a tertiary university hospital between May 2019 and September 2021 was identified and employed for the study. The characteristics of the accidents along with the clinical and imaging findings of the injuries were collected from the patient charts.
Results: During the study period, 104 TBIs related to ES accidents were identified. There was a high occurrence of accidents late at night and on Saturdays. In four cases, the patient's helmet use was mentioned (3.8%). Seventy-four patients (71%) were intoxicated. At the scene of the accident, seventy-seven (74%) of the patients had a Glasgow Coma Scale score of 13-15, three patients (3%) had a score of 9-12 and two patients (2%) had a score of 3-8. The majority (83%) ofTBIs were diagnosed as concussions.Eighteen patients had evidence of intracranial injuries in the imagining. Two patients required neurosurgical procedures.The estimated population standardized incidence increased from7.0/100,000 (95% CI 3.5-11/100,000) in 2019 to 27/100,000 (95% CI 20-34/100,000) in 2021.
Conclusions: Alcohol intoxication and the lack of a helmet were common in TBIs caused by ES accidents. Most of the accidents occurred late at night. Targeting these modifiable factors could decrease the incidence of ES-related TBIs.

5.2 Moderate to Severe TBI

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MANAGEMENT OF POST-TRAUMATIC HYDROCEPHALUS FOLLOWING DECOMPRESSIVE CRANIECTOMY DUE TO SEVERE TRAUMATIC BRAIN INJURY

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Background: Post-traumatic hydrocephalus (PTH) represents a serious risk in patients undergoing a decompressive craniectomy following traumatic brain injury (TBI). Such a condition have a strong impact on TBI morbidity and mortality.
Methods: We discuss PTH development as a complication of severe TBI, assessing the efficacy of its management and outcome on a series of 95 patients in whom decompressive crainectomy was carried on. The degree of post-traumatic ventricular enlargement was quantified from post-operative and check-up brain computed tomography scans. All PTH patients were divided between those having increased intracranial pressure (ICP), and those who have not.
Results: The outcome was enhanced in PTH patients with normal ICP values in comparison to those with intracranial hypertension.
Conclusion: Subdural hematoma, midline shifting, and basal cistern compression are indicators of unfavorable outcome in post-decompressive TBI patients with PTH and elevated intracranial pressure, indicating worse prognosis. Such patients are considered for surgical PTH management consisting of external ventriculostomy and/or ventriculo-peritoneal shunting.

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HYPERTONIC SALINE VERSUS MANNITOL FOR PATIENTS WITH TRAUMATIC BRAIN INJURY: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Background: Traumatic brain injury (TBI) is one of the leading causes of death and long-term disability worldwide. Hypertonic saline (HTS) and mannitol have been reported to play an important role in reducing intracranial pressure (ICP) associated with TBI.
Methods: A computer literature search of PubMed, Scopus, Web of Science, and Cochrane Central Register of Controlled Trials was conducted from inception until January 2022. Studies comparing HTS versus mannitol in TBI patients were selected for the analysis, and all relevant outcomes were pooled in the meta-analysis using Review Manager Software
Results: Nine studies with a total of 385 patients were included in the meta-analysis. Mannitol was superior to HTS in terms of "ICP reduction" (MD -0.39, 95% CI -0.71 to -0.07, P=0.02) and "cerebral perfusion pressure" (MD -0.49, 95% CI -0.84 to -0.13, P=0.007). HTS was superior to mannitol in terms of "two-week mortality" (RR 2.39, 95% CI 1.01 to 5.65, P=0.05) and "mean days of ICU stay" (MD 0.31, 95% CI 0.05 to 0.57, P=0.02). No significant difference was found between the two groups in terms of "Glasgow coma scale" (MD -0.01, 95% CI -0.37 to 0.35, P=0.97), "mean days of hospital stay" (MD -0.05, 95% CI -0.37 to 0.27, P=0.75), "mean arterial blood pressure at 30 minutes" (MD -0.27, 95% CI -0.58 to 0.03, P=0.08), and "mean arterial blood pressure at 60 minutes" (MD -0.20, 95% CI -0.56 to 0.17, P=0.30).
Conclusion: Mannitol showed better results for ICP reduction and cerebral perfusion pressure, while HTS was better in reduction of mortality risk and ICU stay. However, we recommend further randomized controlled trials (RCTs) to compare between HTS and mannitol due to the limited number of published RCTs.

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USEFULNESS OF POLYSORBATE-80 AND SODIUM-LAURYL-SULFATE COATED POLYMERIC NANOPARTICLES AS TRANSPORT SYSTEMS ACROSS THE BLOOD-BRAIN-BARRIER FOR TREATMENT OF TRAUMATIC BRAIN INJURY IN AN EXPERIMENTAL ANIMAL MODEL

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Background: A growing interest exists in using polymeric nanoparticles (NPs) especially functionalized with surface-active substances as carriers across the blood brain barrier (BBB) for potentially effective drugs in traumatic brain injury (TBI). However, the organ distribution of intravenous administrated biodegradable and non-biodegradable NPs coated with different surfactants, how much of the administrated dose reach the brain parenchyma in areas with intact and opened BBB after trauma, as well as whether they elicit an inflammatory response is still to be clarified.
Methods: The organ distribution, brain penetration and eventual inflammatory activation of polysorbate-80 (Tw80) and sodium-lauryl-sulfate (SDS) coated poly l-lactide (PLLA) and perfluorodecyl acrylate (PFDL) nanoparticles were evaluated after intravenous administration in rats prior and after undergoing controlled cortical impact (CCI).
Results: A significant highest NP uptake at 4 and 24 hs was observed in the liver and spleen, followed by the brain and kidney, with minimal concentrations in the lungs and heart for all NPs. After CCI, a significant increase of NP uptake at 4 hs and 24 hs was observed within the traumatized hemisphere, especially in the perilesional area, although NPs were still found in areas away from CCI and the contralateral hemisphere in similar concentrations as in non-CCI subject. NPs were localized in neurons, glial and endovascular cells. Immunohistochemical staining against GFAP, Iba1, TNFα and IL1β demonstrated no glial activation or neuroinflamatory changes.
Conclusions: Tw80 and SDS coated biodegradable (PLLA) and non-biodegradrable (PFDL) NPs reach the brain parenchyma in both areas of traumatized and undamaged brain with disrupted and intact BBB, even though a high amount of them are retained in the liver and the spleen. No inflammatory reaction is elicited by these NPs within 24 hs after application. These preliminary promising results postulate the effectiveness and safety of these NPs as drug-carriers for the treatment of TBI.