

## Glasgow coma scale, brain computerized tomography and Neurophysiological methods as prognostic factors of pediatric coma

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**Background and objectives:** Coma is characterized by the total absence of both arousal and awareness. The outcome of coma depends on the etiology, depth and duration of impaired consciousness. It is likely that brain electrical function monitoring will play an increasingly important role in evaluating prognosis of coma in children.

**Aim:** To compare the predictive values of clinical examinations combined with the recordings of Electroencephalography (EEG) and Brainstem Auditory-Evoked Potentials (BAEP) and computed tomography (CT) of the brain in the evaluation of coma outcome in children.

**Methods:** Twenty children with coma aged 3-14 years were included in the study and subjected to full history, clinical, neurological and otological examination. Medical investigation for coma, EEG, CT brain and auditory brainstem evoked potential (BAEP) measurements were performed for all patients. They were subdivided into 2 groups: group 1 included 8 patients with surgical causes of coma, group 2 include 12 patients with medical causes of coma.

**Results:** There was younger age, lower Glasgow Coma Scale (GCS) and more significant incidence of unfavourable outcome (death, disability) in patients of surgical coma (group 1). A significant difference between both groups was observed regarding the presence of brain edema and intracranial hemorrhage (100% in group 1) while normally visualized basal cisterns were significantly more in group (2) ( $p=0.02$ ). Favourable outcome was strongly related to normally visualize basal cisterns in CT brain ( $p=0.002$ ), normal/ borderline EEG activity ( $p=0.03$ ) and normal BAEP waves ( $p=0.009$ ). Disability was significantly related to slow activity waves ( $p=0.015$ ) and diffuse high voltage EEG discharges (0.009). While mortality was significantly related to the presence of intracranial bleeding in CT brain ( $p=0.02$ ), silence EEG waves ( $p=0.005$ ) and absent BAEP waves (0.012). Conclusion: EEG and Auditory brainstem response are valuable as prognostic predictors of pediatric coma either due to medical or surgical causes. The Glasgow Coma Scale (GCS) has several important limitations as a predictor of survival in the general critically ill population while CT brain is mostly important for diagnostic rather than prognostic factor in comatosed children.

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