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TRACH SCALE: AN ACCURATE PREDICTOR OF SUCCESSFUL VENTILATOR WEAN AND EXTUBATION IN THE NEUROINTENSIVE CARE UNIT.

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Introduction: Current ventilatory weaning parameters are tailored toward patients in the medical and surgical ICU and do not apply well to neurointensive care unit (NICU) patients. It remains essential to identify successful weaning parameters for neurologic and neurosurgical patients. Our goal in this study was to prospectively validate the accuracy of the TRACH Scale in predicting successful ventilator wean and need for tracheostomy in the NICU.
Methods: We identified all ventilated patients (n=96) admitted to our NICU from April - December 2004. We excluded post-operative and spinal cord injury patients. Study patients (n=29) were followed prospectively. An investigator, blinded to the patient clinical and respiratory status, reviewed the head CT scan. Data of GCS, location of any ICH, presence of hydro-cephalus and septum pellucidum shift were collated. The TRACH scale consisted of both clinical and radiological variables. Performance of the model was calculated. Radiological Scale (RSCALE)= L+H+S Location (L): Thalamus=2, Other=0; Hydrocephalus (H): Present=1.5; Absent=0; Septum pellucidum shift (S): Present:3; Absent:0
TRACH Scale score = 3 + (0.8xRSCALE) - (0.5xGCS)
Results: 17% of patients were admitted with ICH, 62% with trauma, 14% with subarachnoid hemorrhage and 7% with stroke. The TRACH scale was very predictive of successful weaning with an ROC=0.908 (p=0.001). Scores varied between -3 and 5.6. Extubated patients had a score of 0.71 (±0.44) and those with tracheostomy had a score of 2.7 (±0.28). A score <0.7 was a good predictor for weaning with a sensitivity (sens) of 100%, specificity (spec) 40%, positive predictive value (PPV) 43%, and negative predictive value (NPV) 100%. A score >2.0 was very predictive for tracheostomy with a sens of 100%, spec 40%, PPV 43%, and NPV 100%.
Discussion: TRACH scale is a prospectively validated scale that can be used to identify more accurately patients for weaning and early tracheostomy. Weaning patients in the NICU should involve consideration of multiple aspects characterizing the brain injury. TRACH scale is the first scale to involve several markers of brain injury, such as neurological exam and neuroimaging. The impact of this scale on clinical outcome and NICU length of stay will need further assessment.
Conflicts: No

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EARLIER INITIATION OF THERAPEUTIC HYPOTHERMIA INCREASES NEUROLOGICAL RECOVERY AFTER ASPHYXIAL CARDIAC ARREST IN RATS

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Introduction – Therapeutic hypothermia after cardiac arrest has been demonstrated to improve survival and functional outcomes. The optimal start time for hypothermia has not been defined. Current clinical practice delays the initiation of hypothermia by at least 1 hour after resuscitation. We investigated the effect of immediate post-resuscitation hypothermia on neurological recovery in a rat model of asphyxial cardiac arrest.
Methods –Sixteen rats were subjected to 9-minute asphyxial cardiac arrest. Subsequently, rats were randomly divided into 2 treatment groups (n=8 per group) with conventional hypothermia to 33oC initiated 1 hour after resuscitation and maintained for 12 hours, or hypothermia to 33oC initiated immediately upon successful resuscitation and maintained for 6 hours. Neurological recovery after resuscitation was monitored by 72-hour Neurological Deficit Score (NDS) and continuous quantitative EEG (qEEG) analysis. The NDS measures level of arousal, cranial nerve reflexes, motor function, and simple behavioral responses and has a range of 0-72. Information Quantity (IQ), a previously validated measure of relative EEG entropy, was employed to monitor electrical recovery.
Results – The 72-hour NDS was significantly improved in the immediate hypothermia group (56.8±8.1) compared to the conventional hypothermia group (52.4±9.8) (P=0.029). The 72-hour IQ score was also greater in the immediate hypothermia group (0.77±0.29) compared to conventional hypothermia group (0.69±0.33) (P=0.027). The IQ score measured at 24 hours correlated well with the 72-hour NDS (Pearson correlation 0.631, 2-tailed significance 0.015).
Discussion – Earlier initiation of hypothermia modestly improved electrical and functional brain recovery in rats after resuscitation from cardiac arrest, despite shorter treatment duration.
Conflicts: Yes