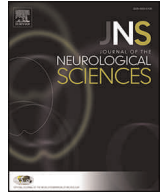


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Neuro Critical Care 1

Postpartum hypernatremic encephalopathy with osmotic cerebral demyelination syndrome and rhabdomyolysis : a unique life-threatening entity

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Background: Hypernatremia produces encephalopathy, osmotic demyelination syndrome and rhabdomyolysis. Postpartum hypernatremic encephalopathy with rhabdomyolysis was recently described.

Objective: To document the clinical, biochemical and radiological spectrum of postpartum hypernatremic encephalopathy.

Methods: Records of women with postpartum hypernatremia from 2007 to 2013 were reviewed. Details of clinical presentation, neurological deficits, biochemical and radiological abnormalities were gathered.

Results: Twenty-six women with postpartum hypernatremia were treated during this period with age range of 18 to 37 years (23.38 ± 4.14). Symptoms consisted of fever (24), delirium (23), altered consciousness (19), progressive quadriparesis (9), ataxia (5), and seizures (3). Symptoms began 2 to 42 days (10.62 ± 9.06) after delivery. Twenty-five patients were in altered consciousness and 17 had proximally dominant weakness at admission. Muscle stretch reflexes were brisk in 15, plantar response extensor in 18 and corticobulbar signs in 8. Initial serum sodium ranged from 151 to 230 (183.92 ± 18.71) mEq/L with elevated chloride (149.05 ± 19.97 mEq/L), urea (114.40 ± 54.59 mg/dl), creatinine (3.16 ± 1.95 mg/dl) and serum osmolal quences (corpus callosum 22, centrum semiovale 18, internal capsule 19 and thalamus 6). Bilateral lateral pontine hyperintensity was seen in six and two had "wine glass sign". Ten patients died and the mortality correlated significantly with Glasgow coma score ($P < 0.0001$), degree of hypernatremia ($P = 0.003$), hyperchloremia ($P = 0.002$), hyperosmolality ($P = 0.01$) at admission. At discharge, four patients recovered completely and the remaining improved gradually.

Conclusion: Postpartum hypernatremia is a unique uncommon neurological emergency. Early detection and careful management of abnormal electrolytemia and azotemia results in good outcome.

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Neuro Critical Care 1

Spectrum of acute encephalitis syndrome in an intensive care unit: an experience from a tertiary care center from India

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Background: There is paucity of studies evaluating the spectrum and outcome of the patients with acute encephalitis syndrome (AES) in intensive care unit (ICU).

Objective: This study reports the spectrum of AES in ICU, and their predictors of mechanical ventilation (MV), death and functional outcome.

Material and methods: The AES patients admitted to the neurology ICU were prospectively included and their demographic details, clinical, hematological, biochemical, MRI findings and etiology were noted. Death during hospitalization, complications and functional outcome at 3 months was noted.

Results: 164 out of 258 (64%) AES patients needed ICU admission. Their median age was 35 (2-85) years and 71 (43%) were females. The etiology was viral in 44 (Herpes and Japanese encephalitis in 12 each, dengue in 17, mumps, measles and varicella in 1 patient each), non-viral in 64 (scrub typhus in 48, falciparum malaria in 6, leptospira in 3, and bacterial in 7), and undiagnosed in 56 (34%). 69 (42%) patients needed MV. On multivariate analysis, Glasgow Coma Scale (GCS) score, SOFA score, thrombocytopenia, raised intracranial pressure and pneumonia on admission were independent predictors of MV. 43 (26%) patients died, and all were in the MV group. SOFA score, untreatable etiology, GCS score, focal weakness and seizures were independent predictors of mortality. At 3 months, 14% had poor and 86% had good outcome. GCS scores, focal weakness and status epilepticus independently predicted poor outcome.

Conclusion: 26% AES patients in ICU died and depth of coma was the constant predictor for MV, death and poor outcome.

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Neuro Critical Care 1

In-hospital neurologic complications in adult patients following open-heart surgery in a tertiary hospital in Cebu City, Philippines

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Objectives: To determine the most common neurologic complications and predisposing factors after open-heart surgery in a tertiary hospital located in Cebu City, Philippines.

Study Design: Retrospective Descriptive.

Participants: Patients who underwent open Heart surgery from July 23, 1994 to July 23 2014.

Results: There were 423 adult patients that underwent Open-heart surgery in the span of 20 years in this tertiary hospital. Coronary Artery Bypass was the most common procedure done with a total of 327 (77.3%), followed by Mitral Valve Repair with a total of 74 (17.49%). Fourteen patients (4%) patients developed postoperative neurologic deficits.

Majority were male patients 11 (79%) and 3 (21%) were females. Among those with neurologic deficits, the mean age was 59.57 years old \pm 10.51. Operations done were CABG (64%), MVR (29%), and AVR (7%).

Preoperative demographics were noted. Majority had a NYHA for CHF of functional Class II. About 57% had Sinus Rhythm, 21% for both Sinus Tachycardia and Atrial Fibrillation. The average Ejection Fraction was 57.86 ± 13.32 . All of the patients who had neurologic deficits had Angina Pectoris on admission.

The average Cross Clamp time was 1.86 ± 0.62 hours and a bypass time average of 2.34 ± 1.28 hours. Postoperative outcomes of patients that developed neurologic deficits were reported. Among the 14 patients 50% of which developed Major neurologic deficits, 21% developed Seizure and deterioration of intellectual function. Time of onset of neurologic complications had an average of 10.23 ± 13.85 hours.

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Neuro Critical Care 1

High altitude neurophysiology applied knowledge: the Hanak project in Ecuador

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Background: About half of Ecuadorians live at various levels of altitude. Brain function is affected by altitude changes, but little is known regarding the factors that lead to such abnormalities. Unraveling these will have significant implications for patients with neurocritical care diseases in Ecuador.

Objectives: 1. To carry out 4 research proposals over a period of 3 years; 2. To collaborate with and train local Ecuadorian investigators in the intricacies of clinical neurosciences research.

Materials and methods: HANAK project will be a multidisciplinary research collaboration between the Baylor College of Medicine (BCM) in Houston, TX (USA) and the Government of Ecuador (Yachay/Senescyt).

Results: we will present at the WCN the methods and scientific rationale for the 4 research proposals that are funded for this project: 1. Prospective Registry of Clinical Management and Long-Term Outcomes of Patients with Subarachnoid Hemorrhage and Intracranial Hemorrhage in Latin America at various levels of altitude; 2. The cerebral effects of ascent to high altitude: non-invasive multimodality brain monitoring; 3. Pressure Reactivity Index (PRx) Monitoring in the Management of Severe Traumatic Brain Injury in Quito and Guayaquil; and 4. Study of Atherosclerosis in Ecuador: influence of varying altitude levels.

Conclusions: Understanding brain behavior at various levels of altitude will lead to better and more targeted treatments. Current therapies are based in clinical studies that have been carried out at sea level. In addition, the research infrastructure for clinical neuroscience research in Ecuador will improve.

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Neuro Critical Care 1

Developing neurocritical care in Ecuador

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Background: Acute neurological emergencies (particularly stroke and traumatic brain injury) are the main cause of death in Ecuador. There are currently no standardized training programs for the pre-hospital, hospital, and post-hospital management of neurocritical care patients in Ecuador.

Objective: To develop a program for the evaluation and management of neurological emergencies in Ecuador.

Materials and methods: this neurocritical care training and educational program will be a multidisciplinary collaboration between the Baylor College of Medicine (BCM) in Houston, TX (USA) and the Government of Ecuador (Yachay/Senescyt and Ministry of Health). The initial pilot project will be carried out at Hospital Eugenio Espejo, which is the largest public hospital in Quito and will be extended to other public hospitals in Ecuador.

Results: we will present at the WCN details of the various phases of the proposal: Phase 1: establishment of cooperative agreements (6-9 months); Phase 2: set up multidisciplinary team and written management protocols (6 months); Phase 3: education and training of Ecuadorian healthcare professionals (physicians and nurses) and protocol implementation (12-18 months); Phase 4: pre and post-program implementation evaluation (6 months prior and 12 months after); and Phase 5: annual evaluation, national certification process, national training programs, and telemedicine program development (5-10 years).

Conclusions: This educational program will result in the following outcomes: prompt evaluation of neurological emergencies and immediate transport to specialized centers; implementation of national protocols; improved clinical outcomes; and improved public education.

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Neuro Critical Care 1

Characteristics of a novel lithotripsy shock wave blast traumatic brain injury

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Background: Many of the suggested methods used to study the effect of blast traumatic brain injury (bTBI) are impractical requiring for laboratory settings.

Objective: We present a novel method to induce bTBI using Shockwave (SW) lithotripsy in rats with histological, angiographic, and behavioral outcomes over the course of injury and recovery similar to those observed in clinical settings.

Material and methods: Anesthetized rats were placed on a lithotripsy machine to deliver 5 SW pulses to the right frontal cortex of each

rat's brain. Animals were assigned to three sacrifice endpoints: 24 hrs, 72 hrs, and 168 hrs. Neurological and behavioral assessments (Garcia's test, beam-walking, Rotarod, and elevated-plus-maze) were performed at 3, 6, 24, 72, and 168 hours post-injury. We performed angiography to assess presence of cerebral vasospasm. Damage to brain tissue was assessed by an overall histological severity (OHS).

Results: Except for beam-walking, OHS significantly correlated with the other three behavioral outcome. OHS correlated most strongly with anxiety at the baseline and 6 hrs post-injury ($r_{\text{baseline}} = -0.75$, $r_{6 \text{ hrs}} = 0.85$; $P < 0.05$). Median hemispheric differences for contrast peak values (CPV), obtained from DSA studies, for 24, 72, and 168 hrs endpoints were 3.45%, 3.05% and 0.2%, respectively, with significant differences at 24 vs. 168 hours ($p < 0.05$) and 72 vs. 168 hours ($P < 0.01$). The differences in CPV were associated with the study endpoints ($P < 0.01$).

Conclusion: We successfully established a preclinical rat model of bTBI with characteristics similar to those observed in clinical cases. This new method may be useful for future investigations aimed at understanding bTBI pathophysiology.

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Neuro Critical Care 1

Successful treatment of spontaneous intracranial hypotension with targeted thoracic epidural patch: reversible coma with reversible corpus callosum splenium lesion

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A 55-year-old man presented with spontaneous intracranial hypotension (SIH) complicated with reversible diffusion restriction in the splenium of the corpus callosum and subdural fluid collections. Cerebrospinal fluid leakage was detected in thoracic spine and the patient was treated with targeted epidural blood patch. SIH can be life threatening and result in different clinical manifestations from mild orthostatic headache to deep coma. SIH is caused by cerebrospinal fluid leakage and results mostly in orthostatic headache. It has been increasingly recognized concomitant with the improved sensitivity of imaging modalities. To our knowledge, this is the first report showing reversible diffusion restriction in the splenium of corpus callosum in SIH; however, it has been described in various disorders. Although the most common clinical manifestation is orthostatic headache, SIH presenting with confusion and coma has rarely been reported. A change in headache pattern or consciousness should alert the physician to the possibility of development of complications, such as subdural hematoma or cerebral venous thrombosis. With the advent of MR myelography, targeted epidural blood patches may be considered as the first-line treatment, directed at the identified spinal CSF leaks. The treatment epidural blood patches, preferably delivered at the level of spinal CSF leaks can be life saving and should be reserved for intractable case.

Fig 1. sagging of the splenium of the corpus callosum, absence of suprasellar cistern and increase of the pituitary gland volume.

Fig. 2. MR myelography shows perineural root sleeve cyst.

Fig. 3. Suprasellar cistern has become visible and volume of the pituitary gland has decreased after treatment.

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