

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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