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NEUROCRITICAL CARE SOCIETY 5TH ANNUAL MEETING NOVEMBER 2-NOVEMBER 3, 2007

ABSTRACTS: Oral & Poster Presentations

Rio Suite Hotel & Casino Las Vegas, Nevada

Neurocritical Care Society
5th Annual Meeting

Oral Presentations
**Friday, November 2, 2007 1:15-2:45 p.m.*
***Saturday, November 3, 2007 9:00-10:30 a.m.*

Presentation #	Title	Presenting Author
1	A Comparison Of Three Radiographic Scales For The Prediction Of Delayed Ischemia and Prognosis Following Subarachnoid Hemorrhage	A. Kramer*
2	Conivaptan for euvolemic hyponatremia in the neurocritical care unit	W. Wright*
3	Hyperosmolar Hypothermic Normoglycemia (H2N) for Preventing Cerebral Edema after Large Hemispheric Infarction -a Feasibility Study	K. Wartenberg*
4	Intracerebral hemorrhage and BOXes elicit a robust inflammatory response in the brain.	G. Pyne-Geithman*
5	Defining Vasospasm after Subarachnoid Hemorrhage: Clinical relevance of Symptomatic Vasospasm, Delayed Cerebral Ischemia, Angiographic Vasospasm and Transcranial Doppler Vasospasm	J. Frontera*
6	HHH Therapy for Tuberculous Arteritis: A Prospective Study	A. Gujjar*
7	A novel approach to treatment of cerebral edema post cardiac arrest	M. Torbey*
8	Nonconvulsive Electrographic Seizures after Human Traumatic Brain Injury Result in a Long-Term Hippocampal Atrophy	P. Vespa**
9	Temperature Manipulation Alters Early EEG Bursting after Cardiac Arrest in Rats	X. Jia**
10	Deep Venous Thrombosis Among NICU Patients Is Prevalent and Often Associated with Intravenous Lines	A. Graffagnino**
11	Usefulness and complication of apnea test for brain death diagnosis (BDD) in 388 cases	I. Previgliano**
12	Intracranial volume adaptation and complications after decompressive hemicraniectomy	C. Tumangday**
13	Mild Hypothermia reduces tissue plasminogen activator-related hemorrhage and BBB disruption after experimental stroke	L. Liu**
14	Predictors Of Outcomes In a Closed Versus Semi-Closed Neurointensive Care Unit	S. Ortega-Gutierrez**

Oral Presentation 9

TEMPERATURE MANIPULATION ALTERS EARLY EEG BURSTING AFTER CARDIAC ARREST IN RATS

Xiaofeng Jia, Anand Venkatramana, Shinyi Tsai, Gehua Zhen, Yujie Wang, Matthew Koenig, Nitish Thakor, Romergryko Geocadin
Johns Hopkins University School of Medicine, Baltimore, MD, United States

Introduction:

Hypothermia after cardiac arrest (CA) improves outcomes, while hyperthermia is harmful. After CA, EEG recovers through periodic bursting, the duration of which is predictive of outcome. The effect of temperature manipulation on early bursting has not been studied.

Methods:

We quantified burst frequency and the interval between CA and first burst (IBCFB) to study the effect of temperature manipulation. Twenty-four rats were evenly divided into 3 groups, based on 6 hours of hypothermia (T=33^{o}C), normothermia (T=37^{o}C), or hyperthermia (T=39^{o}C) immediately post-resuscitation from 7-minute asphyxial CA. Temperature was maintained using surface cooling and warming. Neurological recovery was defined by 72-hour Neurological Deficit Score (NDS).

Results:

There was higher burst frequency during the first 90-minute post-CA in rats treated with hypothermia (24±1.8/min) and hyperthermia (22.6±1.1/min) compared to normothermia (16.9±1.1/min) ($p<0.001$). Different patterns of burst frequency were noted in each temperature group. Within 20 minutes of resuscitation, the hypothermia group had a significantly higher burst frequency than normothermic rats which was maintained throughout 1-hour period ($p<0.01$). Although the hyperthermia group also had a significantly higher burst frequency within 20 minutes ($p<0.01$), it subsequently diminished and converged with normothermic rats by 50 minutes ($p>0.05$). Burst frequency correlated strongly with 72-hour NDS in hypothermic and normothermic rats between 20 and 90 minutes after resuscitation (Pearson correlation 0.845, $p<0.01$). The 72-hour NDS of the hypothermia group (Median:74) was significantly improved compared to normothermia (49) and hyperthermia (43) groups ($p<0.001$) supported by qualitative comparison of brain injury. No differences were noted in IBCFB between the temperature groups (p=0.127).

Conclusions:

In hypothermic and normothermic rats resuscitated from CA, early EEG burst frequency accurately predicts neurological recovery. With hyperthermia, increased bursting within the first hour – presumably due to heightened metabolic rate – may lead to falsely optimistic outcome prediction.

References:

1. Jia, Koenig, Shin, Zhen, Yamashita, Thakor, Geocadin. Quantitative EEG and neurological recovery with therapeutic hypothermia after asphyxial cardiac arrest in rats. Brain Res. 1111,166-175,2006
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3. Geocadin, Ghodadra, Kimura, Lei, Sherman, Hanley, Thakor. A novel quantitative EEG injury measure of global cerebral ischemia. *Clin Neurophysiol.* 111,1779-1787,2000
4. Geocadin, Muthuswamy, Sherman, Thakor, Hanley. Early electrophysiological and histologic changes after global cerebral ischemia in rats. *Mov Disord.* 15,14-21,2000

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