Autonomic nervous system disorders

PP1029
Approximate entropy of heart rate variability as a predictor of survival after ischemic stroke
I.A. Gontschar1, N.I. Nechipurenko2, A.V. Frolov3, L.M. Gul3
1Neurological Department, Republican Research and Clinical Center of Neurology and Neurosurgery, 2Laboratory of Clinical Pathophysiology of Nervous System, Republican Research and Practical Center of Neurology and Neurosurgery, 3Laboratory of Information Technologies, Republican Scientific and Practical Center of Cardiology, Minsk, Belarus

Introduction: The purpose of prospective cohort study was a definition of relationship between the survival of patients after ischemic stroke (IS) with approximate entropy (ApEn) - the nonlinear parameter of heart rate variability (HRV).

Methods: The study included 302 patients with non-cardioembolic IS, admitted in 2007-2013; average age - 66.4±10.9 yrs. Short-term HRV registration (about 5 minutes) was performed on the 4 {3, 7} days of stroke onset. The value of ApEn was calculated by method of Pincus in 2 versions - ApEn15 (m=2, r=0.15SDNN) and ApEn20 (m=1, r=0.2SDNN). The survival analysis of patients with IS was made using Kaplan-Meier curves for 90-day follow-up after stroke.

Results: It has been performed the comparison of survival in patients with ApEn15 not more Q1 level (0.891), with survival in patients with higher entropy (Q2-Q4). ApEn15 corresponded to the lowest quartile in 12 (46.2%) cases among the 26 patients who died and it was in 61 (22.3%) ones among 275 survivors. Low ApEn15 (Q1) level was associated with an increasing risk of death within 90 days after stroke onset: OR=2.9, 95% CI:1.3-6.8, p=0.009. ApEn20 corresponded to the lower quartile of entropy (1.109) in 14 (51.9%) cases among patients who died and it was in 60 (22.0%) ones among the survivor persons. The first quartile of ApEn20 was associated with an increasing risk of death within 90 days after stroke: OR=3.8; 95% CI: 1.7-8.6; p=0.001.

Conclusions: Low ApEn values of HRV is associated with a lethal outcome within 90 days after IS.

Disclosure: Nothing to disclose

PP1030
Gender differences in autonomic imbalance in chronic migraine patients with arterial essential hypertension
O. Grosu1, I. Moldovanu1, S. Odobescu1,2, L. Rotaru2
1Department of Neurology & Neurosurgery, University of Medicine and Pharmacy Nicolae Testemitanu, 2National Institute of Neurology and Neurosurgery, Chisinau, Moldova, Republic of

Introduction: Autonomic cardiovascular activity is impaired in migraine and hypertension patients and gender could play a major role in its expression.

Methods: Study sample include 154 subjects divided in 4 groups: Gr. I (n= 60) - chronic migraine with hypertension (Mg+HBP), Gr. II (n=40) chronic migraine without hypertension (Mg - HBP), Gr. III (n=30) - high blood pressure (HBP) and Gr. IV (n=24) healthy controls (C). All subjects underwent ambulatory blood pressure monitoring for 24 hours. Data collected was analyzed using SPSS.

Results: Study sample was stratified by sex and analyzed male and female subjects separately. Males sample include 10 pts. from the Gr. I, 5 pts. - Gr. II, 13 pts. - Gr. III and 11 - Gr. IV. Mean age was 46.7±8.9 Gr. I vs. 40.8±8.7 Gr. II vs. 39.18±12.33 Gr. III vs. 43.3±12.33 Gr. IV, p≥0.05. Female sample consist of 44 pts. - Gr. I, 34 pts. - Gr. II, 16 pts. - Gr. III and 13 - Gr. IV, mean age 47.22±6.68 Gr. I vs. 41.82±11.59 Gr. II vs. 50.06±8.25 Gr. III vs. 39.46±11.42, p≥0.05. In the male sample were no statistical significant differences between groups for HRV indices. Females from the patients groups (I, II, III) presented the reduced HRV time and frequency domain parameters, especially in the Gr. I (Mg+ HBP).

Conclusion: Chronic migraine patients with hypertension presented reduced HRV in the female sample but not in the male, which reflects the female susceptibility to autonomic imbalance in cardiovascular activity.

Disclosure: Nothing to disclose
PP1031

Episodic hypopnea and hypotension in a patient with a craniocervical ependymoma – a case report and review of the literature

F.S. Ismail, U. Schlegel, S. Skodda
Department of Neurology, Knappschaftskrankenhaus, Ruhr-University Bochum, Bochum, Germany

Introduction: Central hypopnea can be a manifestation of lower brainstem lesions since the neuroanatomical pathways for the control of respiration likely originate in pons and medulla with connections into upper segments of the cervical spinal cord. Vasomotor instability has been described as a complication of medulla oblongata lesions. This case report illustrates the supposable mechanisms of central hypopnea and hypotension caused by interruptions of the central respiratory and vasomotor control.

Case report: A 68-year-old woman presented with subacute and profound worsening of a residual spastic hemiparesis ten years which after partial resection of an upper cervical cord ependymoma. She had a history of arterial hypertension and had experienced several syncopal episodes prior to evaluation. After admission, she was found comatose with insufficient respiration, apnea episodes and systolic blood pressure of 70mmHg. She immediately regained consciousness with stabilisation of blood pressure and ventilation but experienced several further episodes with this symptoms until continuous mechanical ventilation and sympathomimetic medication were applied. MRI revealed an increase in size of the residual tumor, (as compared with former images) with affection of medulla oblongata and signs of subacute hemorrhage. After several months of hospitalisation the patient regained her previous functional state without respiratory or vasomotor failures.

Conclusions: Disruptions of medullary and upper cervical autonomic pathways can cause coma and a life-threatening breakdown of the central respiratory and vasomotor control which can be reversible if the acute crisis can be overcome. Recovery of this patient was interpreted due to resolution of intratumoral hemorrhage.

Disclosure: Nothing to disclose

PP1032

Decrease of parameters of heart rate variability after early stroke rehabilitation

A.L. Lukyanov¹, N.A. Shamalov², G.E. Ivanova¹
¹Stroke Center, ²Russian National Research Medical University, Moskow, Russian Federation

Introduction: The aim of this study was to reveal an influence of early stroke rehabilitation on parameters of heart rate variability (HRV).

Methods: We prospectively included 80 patients (75.0% males; mean age 61.1±8.6) with stroke (81.2% were ischemic) within 48 hours of stroke onset. All patients were treated using the standard medical and physiotherapy. 50 patients enrolled in main group were passive tilted for first two weeks using tilt table under blood pressure, heart rate and SpO2 control. 30 patients enrolled in control group. The analysis of HRV using short-term recordings (5min) was performed. Total power (TP; ms²), standard deviation (SDNN; ms) and very low frequency % (VLF%), low frequency % (LF%), high frequency % (HF%) components were investigated.

Results: The analysis of HRV revealed on admission TP in main group 857.0 (427.5;1,632.5) vs. 843.0 (376.0; 1.123.0) in control LF/HF 3.8 (1.2;6.8) vs. 2.8 (1.2;5.7), LF% 22.0 (14.0; 34.6) vs. 26.0 (15.0;34.0), HF% 7.2 (2.9; 16.5) vs. 10.0 (5.0; 21.5), SDNN 29.0 (21.0; 35.0) vs. 25.0 (18.0; 32.0). We haven’t estimated difference between two groups. The NIH score in main group completed 10.0 (7.0; 18.0) vs. 9.0 (6.0; 17.0). On discharge TP and SDNN decreased in main group: 450.5 (376.0; 990.3), p=0.012 and 24.0 (13.0; 38.0), p=0.021. In control presented: 390.5 (210.5; 775.5), p=0.015 and 18.5 (12.8; 28.5), p=0.024 respectively. The frequency analysis did not reveal dynamics in both groups.

Conclusion: We found that such parameters as TP and SDNN decrease after stroke independently from method of rehabilitation. It may occur due to strong connections of such parameters and damage of central regulation of autonomic nervous system.

Disclosure: Nothing to disclose
PP1033

Heart rate variability in patients with diabetes mellitus type 2

I.V. Velcheva¹, S. Mantarova², P. Damyanov¹
¹University Clinic for Neurology, Sofia, ²University Clinic for Neurology, Plovdiv, Bulgaria

Introduction: Our study aimed to investigate the changes of heart rate variability (HRV) and blood pressure (BP) response after different stimuli in patients with diabetes mellitus (DM) type 2.

Methods: 20 patients with DM type 2 (age range 45-67 years) and 10 presumed healthy age and sex matched controls were included in the trial. All underwent simultaneous non-invasive BP and short-term heart rate (HR) monitoring at rest and after cold stress, deep breathing (DB) and head-up tilt (HUT) with subsequent calculation of the time and frequency parameters of HRV. The effects of the different stimuli on the HRV and the BP were compared.

Results: In the patients with DM the HR at rest was significantly higher in comparison to controls, while the BP values were slightly increased. Parallel decrease of total power (TP), low frequency spectral power (LF) and of mean R-R and mild increase of low frequency-high frequency ratio (LF/HF) were established.

The HUT and the DB caused decrease of BP and it was stronger in the diabetic patients. The cold stress induced predominating in the controls increase of BP. After the three stimuli increase of the examined HRV frequency parameters in the control subjects was observed. This increase was less pronounced in the DM patients after the cold stress and DB. The HUT provoked decrease of HF and TP, while LF and LF/HF remained unchanged.

Conclusions: The assessment of the impaired HRV after different stimuli is useful for the estimation of the cardiac autonomic control in DM.

Disclosure: Nothing to disclose

PP1034

Cardiac autonomic regulation in myopia students

S. Tymchenko, E. Salsabeel
Physiology Department, Crimea State Medical University named after S.I. Georgievsky, Simferopol, Ukraine

PP1035

Sympathetic skin response in children with iron deficiency anemia

A. Sönmezler¹, M. Abuhandan², T.K. Yoldas², Y. Oymak², M. Çalık², B. Güzel², H. Çelik⁴
¹Neurology, ²Pediatrics, ³Harran University, ⁴Medical Physiology, Harran University, Sanliurfa, Turkey