Autonomic nervous system disorders

EP1201
Orthostatic intolerance is frequent in patients with clinically isolated syndrome
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Objectives: The aim of this study was to determine the prevalence of pathological response to orthostatic challenge in patients with clinically isolated syndrome (CIS) suggestive of multiple sclerosis (MS) and to correlate autonomic dysfunction with clinical and MRI findings and serum catecholamine levels.

Methods: We included 40 CIS patients, 18 males and 22 females, aged 16 to 53 years. The pain-provoked head up tilt table test (PP-HUTT) was used to provoke an orthostatic reaction.

Results: Altogether 32 patients (80%) had a pathological response: orthostatic hypotension (OH) (N=13, 32.5%), vasovagal syncope (N=10, 25%) and postural orthostatic tachycardia (POTS) (N=9, 22.5%). There was no significant difference (p=0.177) between type of CIS and type of response to orthostatic provocation (OH, POTS or syncope). There was no significant correlation between presence of autonomic dysfunction and presence of lesions in the brain hemispheres (Spearman coefficient -0.136, p=0.403), brainstem (Spearman coefficient 0.025, p= 0.878), cerebellum (Spearman coefficient 0.153, p=0.346) or the spinal cord (Spearman coefficient 0.048, p=0.784). Pathological response to orthostatic provocation correlated with difference in norepinephrine levels (standing - supine) (Pearson coefficient -0.419, p=0.012), indicating that MS patients with pathological response to orthostatic provocation have higher increase in norepinephrine upon standing. This increase is mainly due to high percentage of patients with postural orthostatic tachycardia who had statistically higher difference in norepinephrine levels (standing - supine) compared to patients with normal response to orthostatic provocation (p=0.03).

Conclusions: This study has shown that orthostatic intolerance is frequent in the initial phases of MS.

Disclosure: Nothing to disclose

EP1202
Evaluation of autonomic nervous system in acute stroke through the assessments of heart rate variability and catecholamine levels
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Introduction: This study aimed to evaluate changes in autonomic nervous system caused by cerebral lesions in acute stroke according to the hemispheric localization of the lesion by assessing heart rate variability and catecholamine levels.

Methods: 60 stroke patients and 31 healthy controls were included. Plasma epinephrine and norepinephrine levels were measured on the 1st, 3rd and 7th days. Heart rate variability (time-domain and frequency-domain analyses) was analyzed on 24-hour Holter recordings. Stroke patients were grouped according to the site of lesion: those with right hemisphere lesion (n=24), those with left hemisphere lesion (n=28), those with brain stem-cerebellum lesion (n=8).

Results: Norepinephrine levels on the 1st and 3rd days were significantly higher in all patient groups than in the controls. Epinephrine levels on the 1st, 3rd and 7th days were significantly higher in the group with right hemisphere lesion than in the controls. On frequency-domain analysis, the group with right hemisphere lesion had higher low frequency and low frequency /high frequency values than the controls. Time-domain analysis revealed significant decreases in standard deviation of the mean of 5-minute 288 R-R intervals values of the groups with right hemisphere and brain stem-cerebellum lesions compared to the controls.

Conclusions: In conclusion, among acute stroke patients, significant autonomic dysfunction was determined in those with right hemisphere lesion. These findings indicated autonomic dysfunction in favor of sympathetic activity. Closer monitoring and treatment of stroke patients, particularly in acute phases, may favorably affect their prognosis.

Disclosure: Nothing to disclose
EP1203

Comparison of sudoscan and Q-sweat for assessment of sudomotor function

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Introduction: Autonomic neuropathy is poorly investigated. As sweat glands are innervated by sympathetic C-fibers, measurement of sweat function has been suggested for assessment of early autonomic dysfunction. Quantitative Sweat Measurement System (Q-sweat) is the commercially available version of Quantitative Sudomotor Axon Reflex Test (QSART), the reference method for sweat function assessment. It is a time-consuming and highly qualified method. This study aimed to compare SUDOSCAN a quick, simple, non-invasive and quantitative method for assessment of sudomotor function to Q-Sweat.

Methods: 100 patients were measured for Q-Sweat on forearm (FA), distal leg (DL) and foot (F). References values were issued from literature. Sweat function using SUDOSCAN was measured on hands and feet. Results were expressed in microSiemens (µS) and electrochemical sweat conductance (ESC) >60 µS were considered as normal. Comparison between the two methods were performed for each corresponding site using Chi² test and focusing on distal sites due to the length dependence of sweat function.

Results: 72% of patients had concordant results between feet ESC and DL Vol.. In our group a good correlation was observed between feet ESC and DL Vol or Foot Vol (p=0.00002 and p=0.002 respectively), and no correlation was found between hand ESC and FA Vol.

Conclusions: These preliminary results that must be confirmed on a larger population, show that SUDOSCAN allowing quick and quantitative assessment could be an interesting tool for early screening of sudomotor function impairment.

Disclosure: Nothing to disclose

EP1204

Abstract withdrawn

EP1205

Comparison of SUDOSCAN and cardiovascular testing for assessment of cardiovascular autonomic neuropathy

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Introduction: Despite its frequency autonomic neuropathy is often poorly investigated. Cardiovascular Autonomic Neuropathy (CAN) has been shown to be one risk factor of morbi-mortality. Measurement of sweat function has been suggested for early assessment of autonomic dysfunction. SUDOSCAN, a quick, non-invasive method to assess sudomotor function, was compared to Ewing tests currently used for CAN investigation.

130 patients addressed for autonomic assessment in various neurologic diseases (suspected small fiber neuropathy, parkinsonian syndromes, ...) were investigated using Ewing tests. CAN severity was defined according to the “Ewing Score” (ES) based on HR variations during controlled breathing, stand test (30/15 ratio) and Valsalva maneuver, BP variations during orthostatic and hand grip tests. To measure sweat function patients were asked to place the palms of the hands and the soles of the feet on large electrodes. Results are provided as Electrochemical Sweat Conductance (ESC) of hands and feet in microSiemens (µS) and risk score for CAN calculated from these conductances.

Results: For a cut-off value of 40µS and 60 µS for foot ESC, the OR for having Ewing score > 1 (vs others) were 14.0 [3.1-63.5] and 6.4 [2.4-17.0] respectively. The highest correlations were observed between Sudoscan risk score and deep breathing and standing 30/15 ratio (-0.50, p<0.0001).

These results suggest that SUDOSCAN allowing quick, reproducible and quantitative assessment of sudomotor function could be an interesting tool for autonomic neuropathy detection and follow-up. This has to be confirmed by assessment of sensitivity/specificity in a large number of patients with different diseases.

Disclosure: Nothing to disclose
EP1206

Autonomic nervous system functional status analysis in type 1 Gaucher disease patients

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Introduction: Type 1 Gaucher disease (GD) is a rare hereditary progressive lysosomal storage disorder with pathological features caused by accumulation of glycosphingolipids in various tissues. GD has been classified into three types based on the presence and severity of neurological involvement. For type 1 it was thought not to involve nervous system, but recent studies suggest peripheral neurological manifestations. Till now, activity of the autonomic nervous system in type 1GD was not tested.

Methods: Present study included 20 type 1 GD patients and 20 age and gender-matched healthy controls. Evaluation of the autonomic nervous system function was performed with Ewing defined battery of tests. Task Force® Monitor software (use of adaptive autoregressive parameters algorithm and Fourier transform velocity) enabled the RR interval spectral analysis of low frequency (sympathetic tone), high frequency (parasympathetic tone), sympathetic-vagal balance and power spectral density as well as baroreceptor sensitivity sequential analysis at rest and upright posture.

Results: Patients with type 1 GD had higher scores of handgrip and deep breathing tests (p<0.01), together with orthostasis and Valsalva maneuver tests (p<0.05) in comparison to healthy subjects. A significant difference was found in overall autonomic score between the two groups (p<0.01). Low frequency RR interval spectral analysis revealed statistically significant lower values in type 1 GD patients (p<0.05) in comparison to healthy individuals.

Conclusions: Our results suggest decreased sympathetic outflow in type 1 GD patients.

Disclosure: Nothing to disclose

EP1207

Metabolic concentrations alternations of bilateral prefrontal lobes and hippocampus after taking codeine phosphate: quantified by 1H-MRS and LCModel

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Introduction: To offer experimental data reference for the further study of codeine habituation.

Methods: Twenty right-handed healthy youth were included (10 males, 10 females, mean age22±2 years). MRS data were collected by GE 1.5T MR scanner, using point resolved spectroscopy (PRESS)sequence (TE/TR 30ms/3,000ms). The regions of interest (ROI) were located over the bilateral prefrontal lobes and hippocampus, size of ROI was 2cm×2cm×2cm. The data of spectra were post-processed by LCModel software and the concentrations of metabolites were ultimated measure. The metabolite concentration of each person was analyzed by paired-samples t test of spss19.0.

Results: Before taking codeine phosphate, the concentration of NAA in left prefrontal lobe was higher than that in the same-sided hippocampus. After taking codeine phosphate, GPC increased in the left prefrontal lobe while Ins declined.

Conclusions: Codeine Phosphate can change the metabolites’ concentrations alternations of the left prefrontal lobes. It is considered that the concentrations of GPC and Ins are related with the drug-dependent.

Disclosure: Nothing to disclose
EP1208

Another cause of dizziness in posterior inferior artery territory cerebellar infarction: orthostatic hypotension

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Introduction: Orthostatic hypotension (OH) is the cause of dizziness that occurred during supine to sitting or sitting to standing. OH can occur in lesions such as the rostral ventrolateral medulla or spinal cord. Cerebellum also modulates cardiovascular control of vestibular system. But there was no report about OH in cerebellar infarction.

Methods: We identified 23 patients with unilateral cerebellar infarction in posterior inferior cerebellar artery (PICA) territory diagnosed by MRI. Standardized autonomic function test including head up tilt test (HUT) using Finapres for recording of beat to beat blood pressure for checking OH were performed. The patients with OH who had no risk factor or showed no OH in follow-up study were sorted by as the OH group.

Results: We identified 8 patients with OH during the tilting. There is no difference in age, sex or risk factor between OH group and comparison group. The mean SBP increase during the tilting was 35mmHg. Patients with OHT showed mild autonomic dysfunction, among which adrenergic dysfunction was the most common abnormality. Lesion subtraction analyses revealed that damage to medial part of superior semilunar lobule was more frequent in patients with OH compared to patients without OH.

Conclusion: We speculate that cerebellar hemispheric areas may participate in regulating BP response in humans. Clinician should be aware of the possibility of OH as cause of dizziness in patients with PICA cerebellar infarction, if patient complained of postural lightheadedness typically triggered by standing from sitting or supine.

Disclosure: Nothing to disclose

EP1209

Gender-related differences in the cardiac autonomic function in patients with Parkinson’s disease.

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Objective: The study aimed to evaluate the influence of gender on the cardiovascular autonomic function in patients with Parkinson’s disease.

Material and methods: 55 PD patients (32 male and 23 female) at mean age 64.5±8.9 years and 40 age-matched healthy controls were included in the study. The Bulgarian version of the SCOPA-AUT scale (SCOPA-AUT-BG) was used for assessment of the autonomic symptoms. The autonomic modulation of HRV was investigated by short-term heart rate (HR) monitoring at rest and after head-up tilt (HUT) with subsequent calculation of the time and frequency parameters of HRV.

Results: The self-reported cardiovascular and thermo-regulatory symptoms from SCOPA-AUT-BG were significantly higher in females in the PD group (p<0.05). No significant gender differences of the HRV parameters at rest could be found. In the healthy controls and only in the PD men the HUT provoked sympathetic excitation with significant decrease in the duration of the R-R interval (p<0.05). In contrast, the test did not induce changes in the duration of the R-R interval in PD women.

Conclusion: The existence of gender differences in the cardiac autonomic function in patients with Parkinson’s disease suggests possible sex - related effect in their expression.

Disclosure: Nothing to disclose
EP1210
Orthostatic intolerance in bariatric surgery patients

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Introduction: The obesity epidemic is increasing worldwide and with it, the healthcare costs of treating the related conditions. Bariatric medicine is attempting to halt this with weight loss and exercise programmes and, with increasing frequency, surgery. This surgery has heralded tremendous success but not without complications.

Methods: The London Clinical Autonomic Neurosciences (LoCAN) group have seen a cohort of 13 patients in the last 10 years who have experienced varying degrees of orthostatic intolerance post bariatric surgery, e.g. the Postural Tachycardia Syndrome (PoTS), syncope. PoTS is characterised by a rise in HR of 30b/m or more, or a HR of >120b/m with orthostasis either during a 10 minute tilt or on standing. All 13 patients underwent a variety of clinical autonomic testing in our units.

Results: Autonomic testing revealed 4 patients exhibiting PoTS, 6 patients with pre-syncope/syncope and 9 patients with low resting blood pressure.

Conclusions: The findings of PoTS and syncope post-surgery are substantiated by the small number of previous studies in this area. As this surgery is becoming an intrinsic part of the health service nationally and internationally, it is imperative that the associated complications be identified and remedied.

Disclosure: Nothing to disclose

EP1211
The peripheral sympathetic neuron is intact in Alzheimer’s disease and frontotemporal dementia behavioural variant

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Introduction: 2012, Zakrzewska-Pniewska reported on a considerable high frequency (27%) of Alzheimer’s disease (AD) patients with pathologic sympathetic skin response test. The question arises whether peripheral sympathetic sudomotor neurons might be involved in tauopathies in analogy to involvement in alpha-synucleinopathies. A specific method to evaluate the postganglionic sympathetic sudomotor function is the Quantitative Sudomotor Axon Reflex Test (QSART). To our knowledge, this is the first prospective study to evaluate QSART in frontotemporal dementia behavioural variant (bvFTD) and AD.

Methods: Patients were recruited from the Department for Neurology, General Hospital, City of Linz. QSART was recorded from 4 standard recording sites (1 arm and 3 leg).

Results: 15 AD (7 female) and 14 bvFTD (9 female) patients were included. Mean age (±SD) of AD patients was 74±9, of bvFTD 71±10 years. Pathologic QSART was present in 3 AD patients and 0 of bvFTD patients (p=0.037). In the AD patients with pathologic QSART one had severe dysfunction and suffered concomitant diabetes mellitus; two minor dysfunctions of unknown origin. In no patient the arm was involved, the only site where sweating tested with QSART persists with increasing age. Sweat results of the 4 recording sites did not differ between both groups.

Conclusions: There are no signs of sudomotor involvement in bvFTD in this exploratory study. Although a similar frequency of sudomotor involvement was observed in AD compared to Zakrzewska-Pniewska, our data suggests, that this finding is not part of the AD disease process but might rather be attributed to the high age.

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EP1212
Catecholaminergic polymorphic ventricular tachycardia presenting with pseudoseizures: Head-up tilt test as a provocation method of adrenergically mediated ventricular tachycardia

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Introduction: Patients with potentially lethal cardiac channelopathies often present to medical care with history of syncope or seizures due to episodic ventricular arrhythmias and associated cerebral hypoperfusion. We suspected an adrenergically mediated syncope in a patient previously diagnosed with epilepsy and psychogenic non-epileptic seizures (PNES) due to anxiety-induced episodes with loss of consciousness, sometimes associated with head injury. We attempted to use head up tilt test (HUT) as a provocation method for an adrenergic response.

Methods: The 27-year-old institutionalised female patient with recurrent emotionally-induced loss of consciousness was diagnosed with syncope when her seizures were recorded on EEG. To study mechanisms of her syncope, she underwent 60° passive HUT with continuous heart rate, blood pressure and EEG monitoring.

Results: 2 minutes after tilting-up, the patient reported feeling anxious, became pale and lost consciousness with generalised myoclonic jerks, respiratory arrest and cyanosis. ECG revealed polymorphic ventricular tachycardia and ventricular fibrillation which spontaneously reverted to sinus rhythm. Genetics testing revealed catecholaminergic polymorphic ventricular tachycardia. The patient was started on a betablocker and has had a cardioverter defibrillator implanted. Her attacks stopped and she regained full independence.

Conclusion: HUT can be used to induced an adrenergic response and appears to be a more potent stressor than standing in some situations. Our clinical case emphasizes the importance of including CPVT in differential diagnosis of PNES and seizures.

Disclosure: Nothing to disclose

EP1213
Cardiac autonomic activity among orphans

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During the past decade there has been rapid progress in understanding of the effects of exposure to traumatic life experiences on psychophysiology in children. Research indicates that response to stressors is not a purely cognitive construct, but is also associated with physiological and neuroendocrine-mediated mechanisms. Though there seems to be little published work on changes in autonomic activity in orphan children.

Heart rate variability (HRV) as noninvasive measure of autonomic input to heart rate has been used to estimate modulation of autonomic tone. HRV was measured in 30 orphans (12.57±0.29 year old; 20 boys) and aged-matched non-orphans (n=31) using five-minute recordings through a standardized protocol and time and frequency domain HRV indices were derived.

Although no significant difference was observed in resting HR and time domain HRV indices between two groups, spectral parameters such as HF and HFn were significantly decreased, while LFn and LF/HF ratio were significantly higher in orphans (p<0.001), suggesting increased sympathetic nervous system functioning as stress response. Distribution of spectral components in orphans was VLF>LF>HF, while in non-orphans we revealed higher HF band power (HF>LF>VLF), that also suggests reduction in HRV and signs of sympathetic activation in orphans, which is often presented before the clinical manifestation of autonomic disbalance.

This study suggests that cardiac autonomic activity among orphans is associated with increased autonomic arousal and reveals the degree of autonomic dysfunction experienced by this population. As cardiovascular risk is highly related to variations of HRV our findings suggest that orphans more vulnerable to cardiovascular problems.

Disclosure: Nothing to disclose