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 RELATION OF DAILY BLOOD PRESSURE VARIATION AND REGIONAL CEREBRAL BLOOD FLOW IN ESSENTIAL HYPERTENSION

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Recently, relation of daily blood pressure variation and target organ damage is absorbed in essential hypertension. The aim of the study was to evaluate relation of daily blood pressure variation and regional cerebral blood flow (rCBF) in essential hypertension using ambulatory blood pressure monitoring and brain SPECT imaging. The study subjects were 42 essential hypertensive patients with no history of any organ failure. Ambulatory blood pressure was monitored every 30 min for from 7 to 21:30 as daytime, and monitored every 1 h for from 22 to 6 as nighttime. Diurnal variation was defined as a difference of greater than 10% between mean daytime and nighttime mean blood pressure (MBP). The subjects were thus classified as dippers or non-dippers. The rCBF was quantitatively measured by n-isopropyl-p-[123 I]iodoamphetamine autoradiography method. Regions of interest on rCBF images were set in the frontal, temporal, parietal, occipital cortex, the basal ganglia and the cerebellum. No significant difference was seen in the age, body mass index, lipid, left ventricular mass index, fasting blood sugar, casual MBP and MBP of all day and daytime between two groups. MBP of nighttime in dippers group was significantly lower and rCBF in all regions in elderly hypertensives. The aim of the study was to evaluate the autoregulatory cerebral hemodynamic response to an head up tilt (HUT) in elderly patients affected by isolated systolic hypertension (ISH). 10 elderly normotensives (aged 60 to 69 yrs, mean 64.5) and 10 elderly affected by ISH (age 60 to 78 yrs, mean 69) have been studied. The cerebral hemodynamics was evaluated with transcranial Doppler by continuous monitoring of the mean velocity (Vmean) in the middle cerebral arteries (MCA), Arterial blood pressure (BP) (Finapres) and CO2 (Cannograph) were simultaneously recorded. After laying in the supine position for a 30 minute baseline stabilization period, all subjects remained for 20 minutes in a standing position on a tilting table (70°HUT). In ISH patients HUT significantly reduced BP in the first 30 seconds more than in elderly normotensives (-11% vs baseline p<0.01 in the hypertensives; -8.9% vs baseline, p<0.01 in normotensives), while in the elderly normotensives the decrease persisted until the end of HUT (-5.5% vs baseline p<0.05), in patients with ISH BP reverted to baseline values soon after the first 30 seconds. In the elderly normotensives the BP decrease was associated with a slight but significant reduction in MCA Vmean until the end of HUT stimulation (F= 6.7; p<0.01 vs baseline in the right MCA; F= 3.3; p<0.05 in the left MCA with ANOVA for the whole curve). In ISH patients MCA Vmean did not show any change during HUT. In conclusion in ISH patients the effects of HUT on blood pressure are short lasting and do not affect cerebral hemodynamics. In these patients in the presence of blood pressure reductions the mechanisms of cerebral autoregulation are not impaired.

Key Words: hypertension, cerebral blood flow, daily blood pressure variation

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 THE CEREBRAL PRESSURE AUTOREGULATION IS IMPAIRED IN THE ELDERLY WITH ISOLATED SYSTOLIC HYPERTENSION

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The aim of this study was to evaluate the autoregulation capacity of the middle cerebral arteries in response to a pressor stimulus in the elderly with isolated systolic hypertension (ISH). A 2 minute cold pressor test (CPT) was used to increase arterial blood pressure by adrenergic stimulation in 10 patients with ISH (60-78 years 69); 10 elderly normotensives (CPT) was used to increase arterial blood pressure by adrenergic stimulation in 10 patients with ISH (60-78 years 69); 10 elderly normotensives (60-69 years mean 64.5) and 10 young normotensives (17-30 years mean 23.5). Cerebral hemodynamics was studied with transcranial Doppler by continuous monitoring of the mean velocity (Vmean) in the middle cerebral arteries (MCA Vmean). Blood pressure (BP) (Finapres) and CO2 (Cannograph) were simultaneously recorded. BP increased in all subjects mean 23.5. Cerebral hemodynamics was studied with transcranial Doppler by continuous monitoring of the mean velocity (Vmean) in the middle cerebral arteries (MCA). Arterial blood pressure (BP) (Finapres) and CO2 (Cannograph) were simultaneously recorded. After laying in the supine position for a 30 minute baseline stabilization period, all subjects remained for 20 minutes in a standing position on a tilting table (70°HUT). In ISH patients HUT significantly reduced BP in the first 30 seconds more than in elderly normotensives (-11% vs baseline p<0.01 in the hypertensives; -8.9% vs baseline, p<0.01 in normotensives), while in the elderly normotensives the decrease persisted until the end of HUT (-5.5% vs baseline p<0.05), in patients with ISH BP reverted to baseline values soon after the first 30 seconds. In the elderly normotensives the BP decrease was associated with a slight but significant reduction in MCA Vmean until the end of HUT stimulation (F= 6.7; p<0.01 vs baseline in the right MCA; F= 3.3; p<0.05 in the left MCA with ANOVA for the whole curve). In ISH patients MCA Vmean did not show any change during HUT. In conclusion in ISH patients the effects of HUT on blood pressure are short lasting and do not affect cerebral hemodynamics. In these patients in the presence of blood pressure reductions the mechanisms of cerebral autoregulation are not impaired.

Key Words: Isolated systolic hypertension, Cerebral pressure autoregulation, Head up tilt

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 THE CEREBRAL ADAPTATION TO HEAD UP TILT (HUT) STIMULATION IS NOT IMPAIRED IN THE ELDERLY WITH ISOLATED SYSTOLIC HYPERTENSION

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The aim of this study was to evaluate the autoregulatory cerebral hemodynamic response to an head up tilt (HUT) in elderly patients affected by isolated systolic hypertension (ISH). 10 elderly normotensives (aged 60 to 69 yrs, mean 64.5) and 10 elderly affected by ISH (age 60 to 78 yrs, mean 69) have been studied. The cerebral hemodynamics was evaluated with transcranial Doppler by continuous monitoring of the mean velocity (Vmean) in the middle cerebral arteries (MCA). Arterial blood pressure (BP) (Finapres) and CO2 (Cannograph) were simultaneously recorded. After laying in the supine position for a 30 minute baseline stabilization period, all subjects remained for 20 minutes in a standing position on a tilting table (70°HUT). In ISH patients HUT significantly reduced BP in the first 30 seconds more than in elderly normotensives (-11% vs baseline p<0.01 in the hypertensives; -8.9% vs baseline, p<0.01 in normotensives), while in the elderly normotensives the decrease persisted until the end of HUT (-5.5% vs baseline p<0.05), in patients with ISH BP reverted to baseline values soon after the first 30 seconds. In the elderly normotensives the BP decrease was associated with a slight but significant reduction in MCA Vmean until the end of HUT stimulation (F= 6.7; p<0.01 vs baseline in the right MCA; F= 3.3; p<0.05 in the left MCA with ANOVA for the whole curve). In ISH patients MCA Vmean did not show any change during HUT. In conclusion in ISH patients the effects of HUT on blood pressure are short lasting and do not affect cerebral hemodynamics. In these patients in the presence of blood pressure reductions the mechanisms of cerebral autoregulation are not impaired.

Key Words: isolated systolic hypertension

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 SINGLE PHOTON EMISSION COMPUTED TOMOGRAPHY OF BRAIN IN PATIENTS WITH METABOLIC SYNDROME

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Aim of study: Definition of brain perfusion autoregulation reserve using single photon emission computed tomography method (SPECT) in pts with Metabolic Syndrome (MS)

Materials and Methods: 10 pts (5 men and 5 women) aged 36-47 with mild arterial hypertension (HT), MS were conducted brain SPECT using radiopharmapreparation (RPP) 99m Tc-HMPOAO at rest and with intravenous injection of Diamox (Acetazolamid) 1 g. The results were processed according to the “Brain Quantification” programme.

Results: While carrying out the researches at rest we revealed: RPP accumulation reduction in parietal lobes of both cerebral hemispheres in 7 pts, 3 of them had it in temporal lobes of the left hemisphere, and 2 pts in frontoparietal lobes of both hemispheres as well (20-40% relatively
maximum accumulation in the cerebellum). In 4 pts with RPP accumulation reduction in parietal lobes of the left hemisphere we also revealed interhemispheral asymmetry (IA) with it’s index 13-16%. While conducting a test with Diamox RPP accumulation increased mainly in the right hemisphere: in its frontoposterior, parietal and parietotemporal lobes; accumulation in frontoposterior, parietal and parietotemporal lobes remained unchanged, which resulted in IA increasing in 8 pts (index 14-20%). IA growth took place in frontoposterior-parietal (6 pts) and parietotemporal lobes (2 pts), 3 pts had significant IA in thalamic nucleus projections.

Conclusion: Thus, in pts with HT and MS revealed autoregulation reserve reduction in parietal lobes of the brain and IA in frontoposterior-parietal and parietotemporal lobes and in thalamic nucleus projection.

Key Words: Metabolic Syndrome

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CEREBRAL ARTERY FUNCTION AND STRUCTURE IN STROKE-PRONE RATS
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The aim of the study was to compare myogenic tone and structural properties of cerebral arteries from stroke-prone spontaneously hypertensive rats (SHRSP), with cerebral arteries from spontaneously hypertensive rats (SHR), before the inevitable development of intracerebral haemorrhage SHRSP and SHR were fed low protein rat chow and 1% NaCl in the drinking water from 8 wks of age and cerebral arteries were studied at 12 wks. Segments of middle cerebral artery were studied in vitro using a pressure arteriograph and video dimension analyzer. Active (myogenic tone) and passive (Ca²⁺ free PSS) diameter were recorded over a pressure range of 20 to 300 mmHg at 40 mmHg increments. The systolic BP was 205 ± 3 v 166 ± 5 mmHg (p<0.001, n=11 & 8) SHRSP and SHR respectively. There was no difference in active or passive diameter across the entire pressure range. For example at 100 mmHg, active diameter was 145 ± 5 v 144 ± 9 m m and passive diameter was 203 ± 7 v 213 ± 5 m m (n.s.n = 11 in each group) for SHRSP and SHR respectively. However, the slope of the active pressure diameter relationship, in the physiological pressure range, demonstrated reduced myogenicity in cerebral arteries from the SHRSP. SHRSP had an increased wall thickness and wall/lumen ratio across the entire pressure range. At 100mmHg wall thickness was 27 ± 1.41v 23 ± 1.(p=0.02) and wall/lumen was 14 ± 0.8 v 11± 0.5 (p=0.015), SHRSP and SHR respectively. Wall-cross-sectional area was increased by 15% (p=0.10, ns), however there was no evidence for remodelling. The slope of the active pressure diameter relationship demonstrates reduced myogenicity in cerebral arteries from the SHRSP compared with SHR. This may explain the predisposition to the development of intracerebral haemorrhage. The structural differences observed may be a consequence of the higher BP of the SHRSP. Hypertrophy rather than remodelling can account for the structural difference, and may occur to offset increased wall stress.

Key Words: Cerebral arteries, Vascular structure, Stroke prone rats