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Model of the anatomical structures of the pelvic floor and pelvis

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Background: The perineal muscles are arranged in three layers. The muscles directly attached to the external genital organs and anus are: the ischiocavernosus, the bulbospongiosus and the sphincter ani externus muscles. Urogenital diaphragm consists of the transversus perinei profundus, the sphincter urethrae and the transversus perinei superficialis muscles. The pelvic diaphragm comprises of the levator ani and the coccygeus muscles. Organs situated in pelvis are: the urinary bladder, rectum, urethra, uterus, vagina, the uterine tube and ovaries in females, prostate and the seminal vesicles in male.

Aim: Creation of a model of the pelvic diaphragm, urogenital diaphragm and organs situated in pelvis with the main vessels and nerves.

Materials and methods: For better results we used mainly materials from human individuals. The bony pelvis and the proxi-

mal part of the femurs were obtained from male and female cadavers. During the preparation of the pelvis the inguinal, sacrospinal and sacrotuberal ligaments were preserved. Muscles, vessels, nerves and some ligaments were made from transparent silicon and colored according to the anatomical atlases (muscles=purple, arteries=red, veins=blue, nerves=yellow). Ligaments were kept transparent. These structures were fixed on the pelvis by glue. Dissected pelvic organs were fixed by waxy preparation method, which is based on the infiltration of organs with wax.

Results: At the end of our work we created an anatomical model representing the relations between the organs, vessels, nerves and muscles in the lesser pelvis and the pelvic floor in human males and females.

Conclusion: The created models can be used in teaching process.

Fibronectin and collagen type IV in portal cirrhosis and chronic venous congestion on the liver

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Introduction: Extracellular matrix is a dynamic complex that can vary in composition. Molecules of collagen type IV (C IV) form framework of basement membranes (BM). C IV is produced in normal liver by quiescent hepatic stellate cells (HSC) and sinusoidal endothelial cells. In normal liver it is distributed in BM of vessels, bile ducts, around axons and discontinuously in the space of Disse. Fibronectin (FN) is a glycoprotein that participates in adhesion and migration of cells, in morphogenesis and haemostasis. In normal liver it is produced by hepatocytes and quiescent HSC. FN is located around blood vessels, bile ducts, in the space of Disse and in hepatocytes. After a liver injury, HSC are activated and produce large amounts of FN and C IV.

Aim of this study was a morphological analysis of distribution of C IV and FN in portal cirrhosis and chronic venous congestion of the liver.

Materials and methods: Antibodies against FN and C IV were used. Findings were digitally recorded and evaluated by software Prover ImageForge 1.1 and Microsoft Excel.

Results: Intense C IV immune deposits were found in BM of endothelium in both diseases. In portal cirrhosis, there was a strong staining of connective tissue in the portal tract and fibrous septa, and a moderate staining along sinusoids. A weak staining was seen along the sinusoids in chronic venous congestion and in BM of bile ducts in both diseases. Antibodies against FN reacted intensely to BM of blood vessels along the sinusoids and weakly to bile ducts in venous congestion. In portal cirrhosis, there was a strong staining of blood vessel BM in the portal tract, a moderate staining along the sinusoids and a weak staining of BM of bile ducts and connective tissue in portal tracts and fibrous septa. FN was detected on margins of fat droplets in hepatocytes.

Conclusions: Both antibodies bind strongly to BM of blood vessels. They react weaker to BM of bile ducts in venous congestion compared to portal cirrhosis. Intense immune staining of FN was found on fat droplets margins.

Regression of left ventricular and aortic hypertrophy in the L-NAME-induced hypertension model: Effect of L-arginine and spironolacton

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Background: Despite of its adaptive character, left ventricular hypertrophy is associated with an increased risk of cardiovascular morbidity and mortality. Thus the search for an effective pharmacological reversion of cardiovascular remodelling remains a current cardiologic problem.

Aim: To show, in the NG-nitro-L-arginine methyl ester (L-NAME)-induced hypertension, whether the precursor of nitric oxide (NO) production, L-arginine, or the aldosterone receptor antagonist, spironolactone, can reverse the hypertrophy of the left ventricle and aortic remodelling in relation to NO synthase activity.

Methods: Six groups of rats were investigated: 1st control after 4 week placebo-treatment (K4, n=8), 2nd control after 7 week placebo-treatment (K7, n=8), 3rd L-NAME (40 mg/kg/day) for 4 weeks (L4, n=9), and 3 groups with 4 week L-NAME treatment followed by 3 weeks of either 4th spontaneous recovery (SR, n=9), or 5th recovery induced by 1500 mg/kg/day L-arginine (A, n=10) or 6th recovery induced by 200 mg/kg/day spironolactone (Sp, n=9). Left ventricular hypertrophy was determined

by measuring the relative left ventricular weight (left ventricular weight/body weight) and aortic remodelling was expressed as aortic wall thickness and cross sectional area. NO synthase activity in the left ventricle and aorta was assessed on the base of the formation of radioactive L-citruline from L-arginine.

Results: 4 week L-NAME treatment decreased NO synthase activity in the left ventricle and aorta. It was accompanied by the increase of blood pressure and hypertrophy of the left ventricle and aortic remodelling. 3 weeks after cessation of L-NAME treatment (SR) we observed a decrease of blood pressure, regression of left ventricular (but not aortic) hypertrophy, without restitution of NO synthase activity in the left ventricle or aorta. Both L-arginine and spironolactone induced recovery led to decreased blood pressure and reversion of left ventricular hypertrophy. However NO synthase activity was restored in both left ventricle and aorta.

Conclusion: Reversion of hypertension and left ventricular (but not aortic) hypertrophy was observed in all studied groups (SR, A, Sp). These changes were not dependent on NO synthase activity.

Quality of life in patients with relapsing-remitting and secondary-progressive multiple sclerosis

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Objective: The aim of our study was to evaluate the health-related quality of life (HR-QoL) in patients with relapsing-remitting and secondary-progressive multiple sclerosis.

Methods: Our pilot-type clinical study consisted of 57 ambulatory and hospitalised patients with definite diagnosis of multiple sclerosis: 31 patients with relapsing-remitting and 26 patients with secondary-progressive form. Data on cognitive functioning (MMSE – Mini Mental State Examination), neurological impairment (EDSS – Expanded Disability Status Scale), possible mood disorders (BDI – Beck Depression Inventory; MAS – Mania Scale), HR-QoL (HAQUAMS – Hamburg Quality of Life Questionnaire in Multiple Sclerosis) and factors potentially influencing HR-QoL (clinical interview) were collected.

Results and discussion: There were significant differences in mean age, duration of illness, number hospitalisations, present employment and/or study, and EDSS score between patients with relapsing-remitting and secondary-progressive multiple sclerosis. HAQUAMS total score was 2.47 ± 0.75 points in the entire

set of patients with multiple sclerosis; 2.12 ± 0.65 in relapsing-remitting respectively 2.89 ± 0.63 in secondary-progressive form. Patients with secondary-progressive multiple sclerosis experienced significantly lower HR-QoL than patients with relapsing-remitting form in HAQUAMS total score ($p < 0.001$), in domains “fatigue and thinking” ($p < 0.05$), “mobility – lower limb” ($p < 0.001$), „mobility – upper limb“ ($p < 0.001$) but not in domains “social functions” and “mood”. We also found significant link between HR-QoL and several factors (present employment and/or study, BDI score, EDSS score, age and number hospitalisations), the factors’ independence was analysed consequently. Finally, we discuss the actual meaning of our study findings.

Conclusions: We have found significant differences in several aspects of health-related quality of life in patients with relapsing-remitting and secondary-progressive multiple sclerosis. Due to their potential importance for management of multiple sclerosis we recommend a further longitudinal research.