Materials of conferences

EXPERIMENTAL VALIDATION AND EFFICIENCY OF WHEAT BRAN BAS PHONOPHORESIS IN INTACT ANIMALS

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Over a period of years we have been studying the effects of large molecular wheat bran (WB)BAS percutaneous introduction in vivo in the patients with common pathology using the energy of various precasted physical factors. A series of experimental studies for the purpose of proving the possibility of the WB active components' penetration through natural (Wistar rats' skin) and artificial (food cellophane) biological membranes under the influence of ultrasound was followed by the clinical experiment. First, the solids were defined in 100 ml of WB semi-spirituous tincture by means of vaporization of the last on boiling-water bath. The solids made 1,14 %. Then, by means of the silufol chromatography method the main active WB substances were detected in the solids: folic acid, vitamins B1, B2 and B6. The solids content amount in the phyto-ointment containing the WB tincture made 0,093 %, folic acid and vitamins B1, B2 and B6 being chromatographically detected there as well. Then, the WB BAS penetration power was studied. The study was carried out in vitro under the following conditions: 1 g of phyto-ointment was applied to the hair deprived skin and the last was affected by ultrasound with the power of 0,4 W/cm^2 in continuous mode for 10 min. The penetrative WB components were defined in clear water subcutaneously by the spectrophotometry method. At the same conditions the WB BAS were defined after ultrasonication of the phyto-ointment applied on an artificial membrane. The investigations showed that under the influence of ultrasound the WB BAS phoresis takes place; however, their content level in the liquid under the skin and cellophane considerably differs on quantitative factors (folic acid, vitamins B1, B2 and B6 content in the liquid under the skin made 0,01 %, under the cellophane – 0,0001 %). In the control experiment (the same conditions, but without ultrasound effect) there were no WB BAS found out under both natural and artificial membranes. The following stage of the experiment was the study of biochemical (glucose and cholesterol level) and immunological factors of blood in 48 intact Wistar male-rats under the influence of ultrasound and WB BAS phonophoresis. The influence was made on the skin of the neck posterior surface for 1 minute and 0,2 W/cm^2 intensive, N7, daily. As the contact medium mineral butter and WB BAS phyto-ointment were used. The blood analyses were carried out before the first and after the seventh procedure. The cervical department ultrasonication resulted in the glucose level decrease in blood from 8,85 ± 0,29 to 3,41 ± 0,21 mmol/l ($P<0,0001$) and cholesterolemia level increase from 2,11 ± 0,08 to 3,08 ± 0,19 mmol/l ($P<0,001$). The WB ointment phonophoresis resulted in the glucosemia decrease as well from 7,28 ± 0,18 to 4,59 ± 0,25 mmol/l ($P<0,001$), increasing the cholesterolemia level thereat (a considerable change of the parameter from 2,61 ± 0,13 to 3,09 ± 0,13 mmol/l ($P<0,02$). The immunological status studies testified that low-frequency ultrasound in the mentioned dosage has a stimulating effect towards phagocytic functions of neutrophils and macrophages, blast-cell transformation, following lymphocytes production and also energy supply of immunological responses (NBT). During the experiment in the group of 24 rats the immunological blood values dynamics under the influence of WB BAS ultraphonophoresis at the identical methods of the procedure was investigated.

The findings testify to:

- the activation of phagocytosis with neutrophil leukocytes (the increase of phagocytic activity of leukocytes (from 42,7 ± 1,21 to 50,4 ± 1,61%; $P<0,001$); the phagocytic index of leukocytes (from 1,15 ± 0,02 to 2,06 ± 0,44 units; $P<0,02$); the index of phagocytosis completeness (from 47,2 ± 1,23 to 53,2 ± 1,59%; $P<0,02$);
- the activation of macrophages (from 46,8 ± 1,56 to 53,9 ± 1,26%; $P<0,001$), the increase of their phagocytic number (from 1,31 ± 0,06 to 1,69 ± 0,09 units.; $P<0,001$), the index of phagocytosis completeness (from 44,3 ± 1,29 to 52,7 ± 1,34%; $P<0,001$);
- the decrease of leukocytes' number circulating in blood (from 12,1 ± 0,49 to 11,9 ± 0,31 x 10^9 kl/ml; $P>0,8$) and increase of lymphocytic level (from c 47,8 ± 1,28 to 54,4 ± 1,23%; $P<0,001$);
- the mass reduction of the circulating immune complexes in blood (from 18,1 ± 1,03 to 13,1 ± 0,59 units; $P<0,001$).
- the increase of the HBT-test factor level from 1,19 ± 0,05 to 1,25 ± 0,04 units. ($P<0,01$);
- the increase of the BTR level to PHA from 1,19 ± 0,04 to 1,41 ± 0,07 units ($P<0,001$) and BTR level to ConA from 1,11 ± 0,02 to 1,44 ± 0,08 units ($P<0,001$).

Thus, the presence of the WB BAS phoresis through semi-permeable membranes under the influence of low intensity ultrasound has been proved. Compared to the ultrasound isolated influence the phytophonophoresis in the intact animals is characterized by more vivid hypoglycemizing and immunostimulating effects, the anti-inflammatory effect of the preparation being clearly manifested; its inhibitory influence on the circulating immune complexes (CIC) in blood testifies to the fact.

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BALNEOTHERAPY AS CHOLELITHIASIS DEVELOPMENT PREVENTION IN DIABETES PATIENTS

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A high bile passages disease incidence, close anatomical and functional relation of the hepatobiliary system and pancreatic gland make the problem of biliary pathology clinical aspects study at diabetes (D) rather topical one.

In this connection the hepatobiliary system morphofunctional state estimation and "Metallurgist" sanatorium mineral water study have been of a certain scientific interest.

260 I and II D type patients with the concomitant biliary pathology confirmed by laboratory-instrumental methods of diagnostics were included into the examination. The obtained results of the carried out research testify that in 52% of the diabetes concomitant biliary pathology cases the chronic noncalculolis cholecystitis (CNC) has been detected. It is important to note that cholelithiasis and cholecystectomy after condition made the rest considerable part (48%). In connection with this the study of the clinical picture of CNC taking course against diabetes is of great interest, as it is this very stage when the prevention of concrement formation in the biliary tract is possible. A greater value of this problem is found among the patients with II type diabetes, as it is among them CNC was registered in 59% of the cases.

For the purpose of cholelithiasis development prevention all the II type diabetes associated CNC patients were individually prescribed the "Metallurgist" sanatorium sulphate-chloride-natrium low-mineralized mineral water together with the traditional drug therapy. At the efficiency analysis of the carried out course mineral water treatment a great attention was paid to the dynamics of clinical presentations and laboratory-instrumental research methods data. A durable positive curative effect, which was achieved in shorter terms than in the patients having got the drug therapy only, is marked. At the duodenal drainage carrying out after the treatment the bile lithogenicity decrease, disappearance of inflammation signs in the bile passages are registered. The dynamic hepatobiliscintigraphy results showed that drinking spa treatment promotes the hepatocytes' absorbing-excretive function improvement. According to the dynamic echocholecystography data the evacuation function of the bile cyst improves authentically ($K_{eff.}$= 52,33±1,19%, p<0,01) after the mineral water course treatment, and, as a consequence, the rest amount of bilis decreases (V_k=15,46±0,42см^3, p<0,01).

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AGE-RELATED CHANGES IN THE STRUCTURE OF ADENOHYPOPHYSIS DURING EARLY POSTNATAL ONTOGENESIS

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The hypothalamo–pituitary–adrenocortical axis plays a vital role in adaptation of the organism to homeostatic challenge (**J.P.Herman et al., 2003**). During most of infancy, from approximately postnatal day 4 to 14, the rat displays a stress hyporesponsive period in the form of markedly attenuated adrenocorticotropin and corticosterone responses to environmental stressors that elicit pronounced elevation of ACTH and corticosterone in pre- and post-stress-hyporesponsive period rats (**J.Lehman et al., 2002**). After that the pituitary gland undergoes the prominent age-related adaptation changes. The different cell types in the anterior pituitary behave as dynamic populations, as the hypophysis maintains a continuous renewal of cells to ensure a balance between cell division, differentiation, growth arrest and apoptosis **(L.Claudius et al., 2006).** Numerous discrepancies in the evaluation of activation, hyporesponsiveness, facilitation and dissociation of the hypothalamo–pituitary–adrenocortical axis in the early age may be explained by a very limited information available in the literature on the age-related structural changes in the central link of the axis - adenohypophysis - during early postnatal development **(C.Kaur et al., 2002; A.Armario et al., 2004; X.Belda et al., 2004; C.Marquez et al., 2005).**

The objective of this study was to evaluate the developmental changes in the pituitary gland of the growing rats during early postnatal development using the modern methods of the quantitative immunohistochemistry.

Preweaning, weaning and early postweaning Sprague-Dawley rats aged 14, 21 and 30 days after birth (1st, 2nd and 3rd age groups accordingly) were weighed and sacrificed by cervical dislocation, their pituitary glands were removed, weighed, fixed in formalin and embedded in paraffin. Serial sections 4 mcm thick were stained with hematoxylin-eosin and immunohistochemically with monoclonal antibodies against ACTH and PCNA using streptavidin-biotin-peroxidase method with subsequent DAB-staining and image-analysis of the immunohistochemically stained slides. Image Pro Plus 4.5 software was utilized to evaluate the volume and numeric density of the immunoreactive cells.

The results obtained in the present investigation demonstrated that the pituitary gland mass in-