

planned at the beginning of training, and teaching methods (based on what the students already know). That said, the role of a teacher is changed: he/she is not just the carrier of ready answers to any questions, but an advisor and assistant in students' work on problems. His/her functions changed: now, a teacher must 'draw knowledge from the students, and establish the environment of cooperation at the training, which is more like a seminar than a lecture.

Thus, nowadays, there is an essential need (which is confirmed by both our and foreign practices of training) in activation of cognitive work of students, development of skills and abilities of analysis and estimation of a problem, and based on it, development of logic thinking, which helps shape a modern public health official as a person ready and able to implement modern innovative technologies in practical health system.

References:

1. Anisimov O. S. Acmeology and methodology: issues of psychic techniques and thought techniques. Moscow, 1998, 772 pages.
2. <https://ru.wikipedia>
3. <http://www.medmedia.ru>

Inoyatova Flora Ilyasovna,

M. D., Professor, Head of Hepatology Department of Republican specialized scientific-practical medical center pediatrics,

E-mail: hepar.child2011@yandex.ru

Yusupalieva Gulnora Akmalovna,

M. D., docent, candidate of medical sciences,

Head of Clinical Radiology Department of Tashkent pediatric medical institute,

E-mail: ygulnora@mail.ru

Doppler researches informativeness in diagnosis of chronic viral hepatitises in children

Abstract: The data of 150 children after ultrasound examination are given in the article. Those were clinical laboratory results that not always reflect the real pathologic picture of hepatic processes with the divergence of 14%-37%. Additional doppler test in the combination with echography is shown to enable not only increase in diagnosing effectiveness up to 35,3%, but also in having in idea of the condition of parenchyma and spleen, collateral dysfunction of blood circulations and marked portal hypertension. Similar direction of structural functional impairments of hepatic vessels was determined. Direct and indirect criteria in diagnosing of portal hypertensions were worked out.

Keywords: chronic viral hepatitis, diagnostics, ultrasound, Doppler ultrasound, children.

Urgency. Chronic viral hepatitis (ChVH) presents severe problems for health services in most countries in the world and also in Uzbekistan. Due to its wide spread and the variety of forms as mild, severe, progressive and even cirrhosis [3, 5, 6, 7], the problem attracts particular attention in pediatrics and one of the causes is irregular sometimes wrong diagnostics of pathologic process in the liver. It is due to variety of clinical manifestations, similarity of symptoms of other gastrointestinal tract diseases, "scantiness" of objective signs, insufficient interpretation in literature on pediatrics matters of screening diagnostics, absence of conformity between pathology change in the liver and its manifestation [5, 8, 10, 11]. The main point of the development of chronic liver diseases is the development of the successive stages of fibrosis of the liver with cirrhosis at the end. The best standard diagnosing method in liver fibrosis is biopsy. However, the invasive method, possible errors in evaluation of the results with sampling error (incompatibility of local tissue area to the total process in the

liver) and practical limits in biopsy in children give rise to the study of other, more available methods in diagnostics.

The experience in pediatrics certifies the necessity of popularization and in all area inculcation of USI. The preferences given to ultrasound echography in the combination with dopplerography of the vessels in various systems. It is not only supplement to two dimension USI but enables to reveal delicate mechanism of hemodynamics disturbances in the cases not diagnosed by using the standard echography [1, 2, 9, 12]. At this point of view, the role of Doppler in complex evaluations of the conditions of the liver the ChVH in children is of great significance.

Purpose of the investigation: comparative evaluation of informatively of echography and hemodynamic disturbances in the hepatic vessels and spleen in children with ChVH.

Materials and methods.

150 children with ChVH at the age of 3–14 years old were under the investigation: 3–6 years old — 37,3% 7–14 years old — 62,7% with minimal activity — 30,3% (1st group), mild

activity — 30,3% (2nd group), marked activity — 30,3% (3rd group). Among them boys constituted 75%, girls — 25%. Remoteness of ChVH was $5,2 \pm 0,3$ years on average.

The diagnosing was made on the basis of clinical, biochemical, serologic, and instrumental data with the recommendation of B. F. Uchaykin and coauthors [5] and F. I. Inoyatova and coauthors [4].

Clinical tests of children included detailed collection of history data, clinical examination with totality of signs. Biochemical, blood test included determination of ALAT, ASAT activity, protein content and its fractions, general and direct bilirubin, alkaline phosphatase, Hama-GTP, thymol test, fibrinogen, prothrombin unified methods with the help of commercial set of "Optima" on biochemical analyzer ФП-901 with the use of "HUMEN" (Germany). Virology Verification HBV, HCV, HDV were carried out by ELISA and PCR with the use of sets "BCM" (Moscow).

Instrumental examination included through — skin echography of the liver, gall bladder and spleen and the vessels by standard methods [2], on Inter SCAN-250 (Germany). With electronic transducer working at 3,5–5Mhz. Dopplerography was done on scanners working in real time scale with grey shades of SSD-630 "Aloka" (Japan) and "Sterling" Phillips (Holland) with convex sensors frequency from 2,55.0Mhz in impulsive regimen. Hemodynamic indications of celiac trunk, general hepatic artery, splenic artery were taken into account.

Maximal or systolic rate (V_{max} in m/sec), minimal and final diastolic rate (V_{min} in m/sec), moderate value of maximal rate (TAMX in m/sec) which was determined by manual tracing of the curve of blood flow rate during three cardiac cycles, pulse, index (PI) equal to $V_{max} - V_{min} / TAMX$, resistance index (RI) equal to $V_{max} - V_{min} / V_{max}$ were measured.

Mathematical processing was done by statistics program "Statgraff" with determination $M \pm m$, t , statistic and graphic system "Diasta" to carry out variable statistics.

Results and discussions.

The results of investigations proved the idea of insufficient and various informativity of clinical biochemical data in diagnosing of pathological process in the liver with ChVH.

Severity of clinical syndromes as well as the level of hyperenzymemia, viral load not always correlated with pathologic process in the liver. The data of USI and DG of the liver enable to evaluate the conditions of the liver and spleen and appeared to be of big interest.

According to USI results in children with minimal activity of ChVH it was revealed that changes in most echographic sign of the liver/spleen were normal, but the walls of the gall bladder were found to be thickened (70,0%), echo heterogeneous content (34,0%), inflections in the bottom, body and/or neck (62,0%).

Echography of the liver and spleen and its comparison between the moderate and marked activity revealed similar direction of the changes with expressiveness in children with high activity of pathologic process. So, hepatomegaly with not

smooth borders, density of the capsule and high echogenicity of parenchyma was mostly noted in children of 3^d group ($p < 0.05$). Changes in parenchyma varied from moderate focal to large focal with different density structure in most patients (64%, $p < 0.01$). In that type of patients not clear vascular picture was noted two times more often, and in some cases (24%) were not visualized at all ($p < 0.01$). Most patients were noted to have increased portal vein diameter (62% and 74% correspondingly in 2nd x 3^d groups), where big sizes (> 12 m/m) prevailed in children with marked activity (40% against 18%, $p < 0.01$). The signs of portal hypertension were accompanied by the disturbance in the walls as density, thickening winding with areas of deformity of vessel cavity. Echo picture of the gallbladder didn't differ, thickening of the walls with "doubled outline", heterogeneous content, inflections in the area of the body bottom and or the neck were the characteristic changes. Also they were noted in ultrasound data of the spleen, where marked active form of the spleen acquired spherical shapes by rounded edges (56%) with increased echogenicity and dense parenchyma (100%), and also by large (> 7 m/m) diameter of splenic vein (66,6%, $p < 0,01$). Disturbances of the splenic vein wall were visualized by the density and winding of the vessel at gate of a spleen of and gleam thinning of the vessels in the parenchyma of the organ.

The analyzing of the hemodynamic disturbances in the hepatic vessels and the spleen in children showed the sensitivity of the method in severity evaluation of pathologic process in the liver to be higher than in other clinical laboratory methods, including USI. Mean while all parameters differed from the those in healthy children ($p < 0.01$).

In children of pre-school age with minimal activity of ChVH reliable hemodynamic disturbances were observed in celiac trunk in parameters V_{max} in decrease of linear rate of blood flow ($1,75 \pm 0,08$ m/sek), PI and RI — increase of resistance indexes (to $1,15 \pm 0,02$ and $0,61 \pm 0,01$ correspondingly) and V_{vol} decrease of the volume blood flow (to $118,1 \pm 0,11$ $p < 0,05$). In the group of moderate activity some tendency ($p < 0,05$) was seen.

In severe activity deviations in celiac trunk data were more intensive; deviations in TAMX and V_{min} ($p < 0.01$) parameters were revealed additionally. The analysis of blood flow in general hepatic artery revealed some direction in deviations; the difference was in earlier changes with minimal activity of moderate value of maximal rate (decrease of TAMX) as well as final diastolic rate (decrease of V_{min}) in narrowing of the diameter of the vessel (to 0,36 m/m).

As for splenic artery, the some patterns with more intensive shifts covering all the parameters were noted children with severe activity of ChVH ($p < 0.01$). The picture certifies the severity of the vascular pathologic changes in blood flow, the intensity of which rose by the pathologic development in the liver.

Similar deviations in hemodynamics were revealed in school children. Only RI increase and V_{min} decrease in splenic artery at minimal activity of ChVH ($p > 0.05$) can be noted.

This, evidently, proved compensatory possibility of liver hemodynamics.

Thus, the changes in the resistance and blood flow rate testified the increase of vascular tone, the possibility of vascular spasm as a result of vascular wall damages, early or acute signs of syndrome of portal hypertension.

On individual evaluation, the disturbances revealed in vascular flow enabled early stages of portal hypertension diagnosing. According to the data of gray scale USI the portal hypertension was observed in 58% of patients but the doppler test presents it in 93,3% of cases ($p < 0.01$).

On the basis of dopplerography a number of patients were transformed to the related group and it was significant for further doctor's tactics: 14% with minimal activity were referred to the group of moderate activity; 26% with moderate activity were transferred to severe one, and 37,0% of children with severe deviations composed a group with a risk of cirrhosis of the liver.

Results of the research enabled to detect the direct and indirect ultrasound signs to observe latent and clear changes in the liver spleen also, to determine the signs of portal hypertension.

Chief symptoms are: splenomegaly, dilatation of vein in portal system (more than 9 m/m) and splenic artery (more than 7 m/m), decrease in linear rates of blood flow (V_{min} , V_{max} , TAMX), increase resistance indexes. (PI and RI), decrease of V_{vol} in all arteries seen in the research. Totality of three or more signs certifies the development of portal hypertension and possible cirrhosis.

Indirect signs: density of the hepatic capsule, unevenness of the borders, winding direction of intrahepatic vessels, presence of numerous with different density foci of the density.

These signs showed highly specific features — 66% and reflected the processes of fibrous and regeneration of parenchyma of the liver.

Conclusion.

Ultrasound examination of the children and clinical laboratory findings not always reflect the real picture of pathologic process in the liver, where the divergence may vary in the ranges of 14%-37%. Additional apply of dopplerography in the combination of echography makes possible not only to increase the effectiveness of diagnostics to 32,3% but also to see clearer the condition, collateral disturbances in blood circulation and severity of portal hypertension direct and indirect criteria of pathology changes in the liver should be taken into account. No matter the age is the direction of the disturbances in hemodynamics has some tendency in deviations at all parameters: and resistant index (PI) in general hepatic artery, PI and RI indexes of resistance in splenic artery could be noted. Rise in indexes data with decrease of blood flow volume rate in the arteries proves the presence of deep structural functional disturbances in the hepatic vessels which are caused by severeness of morphologic changes in the affected organ. Thus, dopplerography is a valuable method of examination of children with ChVH, which gives the possibility in diagnostic and prognosing ways of clinical specialists as addition to diagnostic complex that timely reveals latent and marked form of portal hypertension, assess the activity of pathologic process in the liver based on hemodynamic disturbances in visceral vessels, administrate specialized medical help.

References:

1. Dvoryakovskaya G. M., Potapov A. S., Dvoryakovskiy I. V. The comparative analysis of data of ultrasound and morphological researches of a liver at chronic hepatitises in children. *Ultrasound and functional diagnostics* – M., 2005. – No. 1. – Pages 39–47.
2. Dvoryakovskiy I. V. *Echography of an internal organs in children*. – M.: "Vidar", 1994. – p.450.
3. Inoyatova F. I. *Chronic hepatitis C in children*. T: "Shark", Tashkent, 2009. – p.414.
4. Inoyatova F. I., Abdumadzhidova Sh. U., Inogamova G. Z. etc. A condition of the physical and neurosomatic status at the children sick with chronic viral hepatitis B. *Method. recommendations*. – Tashkent, 2002. – p.9.
5. Uchaykin V. F., Cherednichenko T. V., Smirnov A. V. *Infectious hepatology*. M.: "GEOTAR-media", Moscow, 2012. – p.640.
6. Uchaykin V. F., Cherednichenko T. V., Pisarev A. G. Evaluations of chronic hepatitis course in children *Russian journal of gastroenterology* – 2000. – № 2. – Page 48–52.
7. Uchaykin V.F, Chuelov S. B. Rossina A. L. and others. *Cirrhosis of the liver in children*. *Pediatrics*, 2008 T.87-№ 5 – p.52–59.
8. Yudjin R. Shiff, Michael F. Sorrel, Willis S. Murday. *Viral hepatitis and cholestatic diseases* M: "GEOTAR-Media" Moscow, 2012-p.395.
9. Ahmetoglu A., Kosucu P., Arikan E. et al. *Hepatic vein flow pattern in children: assessment with Doppler sonography*. *EJR*. – 2005. – Vol. 53. – P. 72–77.
10. Broide E., Kimchi N. A., Scapa E. *Chronic hepatitis C infection in children*. *Minerva Gastroenterol Dietol*. – 2006. – Vol. 52, № 2.-P. 187–193.
11. Liberek A., Gora-Gebka M., Luczak G. et al. *Chronic hepatitis B in children – is it still a real problem?* *Med. Wieku Rozwoj.*- 2007.- Vol.11, N4.- P. 359–366.
12. Uzun H., Yazici B., Erdogmus B., Kocabay K., Buyukkaya R., Buyukkaya A., Yazgan O. *Doppler waveforms of the hepatic veins in children with diffuse fatty infiltration of the liver*. *Eur. J. Radiol*. – 2009. – 71. – p. 552–556.