CLINICAL CASE

S.A. Evseeva, M.I. Nikiforova, N.A. Danilov, A.F. Zhelobtsova, N.N. Innokentieva, O.N. Ivanova, I.S. Ivanova, T.E. Burtseva

ACUTE TOXIC HEPATITIS ON THE BACKGROUND OF TYPE 1 DIABETES MELLITUS IN AN ADOLESCENT

DOI 10.25789/YMJ.2023.83.29

УДК: 616.36-053.2

The article presents the interesting clinical case of acute toxic hepatitis in a child suffering from diabetes mellitus of the 1st type against the background of taking analgesic drugs.

Keywords: toxic hepatitis, acute hepatitis, type 1 diabetes mellitus, examination, diagnosis.

Introduction. Toxic hepatitis is a liver damage caused by exposure to chemicals and hepatotropic poisons, which leads to liver inflammation and necrosis of hepatocytes. The prevalence of toxic hepatitis is 2 cases per 100 thousand population [5]. There is enough information about toxic hepatitis in modern scientific literature, the forms, clinic, diagnosis and therapy, as well as predisposing factors and methods of prevention of this condition in adults are described [3]. Clinical cases of toxic hepatitis in children are rarely described. The available literature describes rare cases of toxic hepatitis against the background of using antipyretics [2,4].

EVSEEVA Sardana Anatolievna – PhD, senior researcher of the Yakut Science Center of Complex Medical Problems, sarda79@mail.ru; **NIKIFOROVA Margarita Egorovna** – head of the Department of Pediatric Gastroenterology and Endocrinology, Pediatric Center of the Republican Hospital No.1- National Center of Medicine; **DANILOV Nikolay Andreevich** – endocrinologist, the Department of Pediatric Gastroenterology and Endocrinology, Pediatric Center of the Republican Hospital No.1- National Center of Medicine, postgraduate student of the Medical Institute, M.K. Ammosov Northeastern Federal University; **ZHELOBTSOVA Ayana Fedotovna** – endocrinologist, the Department of Pediatric Gastroenterology and Endocrinology, Pediatric Center of the Republican Hospital No.1- National Center of Medicine; **INNOKENTIEVA Natalia Nikolaevna** – endocrinologist, the Department of Pediatric Gastroenterology and Endocrinology, Pediatric Center of the Republican Hospital No.1- National Center of Medicine; **Ivanova Olga Nikolaevna** – MD, Professor, Professor of the Department of Pediatrics and Pediatric Surgery, MI NEFU; **IVANOVA Irina Semyonovna** – the 3rd year student of the Faculty of Medical Care, MI NEFU; **BURTSEVA Tatiana Egorovna** – MD, Associate Professor, Professor of the Department of Pediatrics and Pediatric Surgery, MI NEFU, head of Laboratory, the Yakut Science Center of Complex Medical Problems, bourtsevat@yandex.ru

In April 2022, WHO reported cases of severe acute hepatitis of unclear etiology in children. By the end of May 2022, 650 cases were known to have occurred in children in 35 countries worldwide. In ≈10% of cases hepatitis was complicated by formation of liver failure, at least 11 lethal outcomes were registered [1]. In this connection, description of clinical examples of toxic hepatitis becomes very relevant for problem clarification.

There are almost no data on clinical examples of toxic liver damage in children against the background of type 1 diabetes mellitus. The presented clinical example is a vivid case of how a child with a severe underlying disease like type 1 diabetes mellitus suffered severe acute liver damage on the background of long-term use of analgesic, anti-inflammatory drugs.

Clinical Example: A 14-year-old child consulted the admission and diagnostic department of the Republican Hospital No.1-NCM with the following complaints: general weakness, back and leg pains, unstable sugar level, palpitations, shortness of breath. He was admitted to the Department of Pediatric Endocrinology and Gastroenterology, Pediatric Center, Republican Hospital No.1-NCM.

Anamnesis of life: A child from the 13th pregnancy, which proceeded smoothly. P-4, natural childbirth, at 40 weeks. Weight at birth was 3530 grams, length was 52 cm. He was applied to the breast for 1 day. He sucked actively. Apgar score was 8/9. He was discharged on the 5th day. He was breast-fed till the age of 4 months, complementary feeding was from the age of 6 months. Psychomotor development was up to 1 year of age. Preventive vaccinations were given according to schedule. Transferred diseases: SARS, chicken pox. He had Coronavirus infection in February 2022. He had no injuries or surgeries. Heredity was aggravated by diabetes, sister had diabetes mellitus type 1.

Allergologic history was normal. Epidemiological history: he denied any contacts with infectious patients.

Anamnesis of the disease: Diabetes mellitus debut since the age of 13. He was admitted in the state of ketoacidosis. Examination. Clinical diagnosis: Diabetes mellitus, type 1. First detected. Ketoacidosis. Received treatment and recommended replacement therapy: Tresiba (prolonged-acting insulin) at 22 hours, 18 units, fiasp (short-acting insulin) 10-12 units 3 times a day. The child was issued disability.

In September 2022 the patient was admitted to the Pediatric Endocrinology and Gastroenterology Department of Pediatric Center of Hospital No.1 - NCM. Taking into account the patient's stable condition, replacement therapy was not changed.

At the beginning of December 2022 the child felt unwell. Biochemical blood tests were performed in the district clinic and increased blood transaminases levels were revealed: ALT was 1232.2 units/l, AST was 740.9 units/l. The child was urgently admitted to the Admission and Diagnostic Department of the Pediatric Center of the Republican Hospital No.1-NCM. While collecting anamnesis from the child it was found out that the child took Naiz, Ibuprofen, Ketorol for headache not constantly for 6 months.

Objective status: Condition was satisfactory. Height was 166 cm. Weight was 45 kg. BMI was 16.3. Body temperature was 36.4, respiratory rate was 20 per 1 minute, heart rate was 87 per 1 minute, blood pressure was 120/70 mm Hg. Consciousness was clear, active. The build was correct, reduced in nutrition. The skin was clean, normal coloring, no strictures. The pharynx was calm. Thyroid gland was not enlarged, painless. There was no tremor. Breathing in the lungs was vesicular, no rales. Heart tones were

clear and rhythmic. The abdomen was soft, moderately painful in the epigastric region. The liver was not enlarged and painless on palpation. Physiological excretions were normal, according to his words. Sexual development was of the male type, pubertal. Tanner III-IV.

In the general blood test of December 09, 2022: hemoglobin (HGB) - 122 g/L (RI: 108-145g/L); red blood cells (RBC) -3.7x10^{12}/L (RI: 3.9-5.29x10^{12}/L); platelets (PLT) - 320 10^9/L (RI: 175 - 345x10^9/l); white blood cells (WBC) -4.58x10^9/l (RI: 3.84 - 9.84x10^9/l); lymphocytes (LYMF) - 52.6% (RI 16. 4-52. 7%); monocytes - 9.0x10^9/l (RI: 4.4 - 12.3x10^9/l); stab neutrophils - 5% (RI: 1-5%); segmented neutrophils - 34. 0% (RI: 32.5 - 74%); eosinophils - 5% (RI: 0-5%), monocytes (MONO) 9% (RI: 4.4 -12.3%); determination of ESR by the Panchenkov method was 34 mm/h (RI: 1-15 mm/h). Conclusion: thrombocytosis and increased ESR were observed.

Biochemical blood analysis of February 09, 2022: total protein 61 gp (60-80 g/l); albumin 38.4 gp (38-54 g/l), alanine aminotransferase (ALT) 603. 5 U/L (RI:0 to 27 U/L), aspartate aminotransferase (AST) 720.6 U/L (RI: 0-29 U/L); alkaline phosphatase 212.7 U/L (RI: 0-75 U/L); total bilirubin 61.1 mol/L (RI:3.4-17.1 µmol/L), total cholesterol 6.22 mmol/L (RI: 1. 2-5.2 mmol/l) Creatinine 54.5 µmol/l (27 to 62 mmol/l), high-density lipoproteins (HDL) 1.51 mmol/l (RI: 0.96-1.91), lactate dehydrogenase (LDH) 502 sl/l (RI: 0-250 sl/l), glucose 6.98 mmol/l (RI: 3.3-5.6 mmol/l). Conclusion: increased ALT and AST, glucose level, total cholesterol, LDH.

Study of the hormonal profile dated December 09, 2022: Thyrotropic hormone (TSH) - 1.2 mIU/L (RI: 0.4 - 4.00 mIU/L), free thyroxine (T4) - 10 nmol/L (RI: 9.00-22. 00 nmol/L), thyroperoxidase antibodies (AT to TPO) - 2.4 units/mL (RI:00-30.00 units/mL), triiodothyronine (T3) 3.58 pmol/L (RI: 2.6-5.7 pmol/L).

Glycemic profile:

December 08-09, 2022 Blood sugar at 10 pm - 13.38 mmol/L, at 3 am - 7.58mmol/L, at 07 am - 5.15 mmol/L.

December 14-15, 2022 Blood sugar at 7 am - 9.59 mmol/l, at 11 am - 13.50 mmol/l, at 4 pm - 22.77 mmol/l, at 8 pm - 19.63 mmol/l, at 3 am - 3.32 mmol/l, at 07 am - 3.33 mmol/l.

December 18-19, 2022 Blood sugar at 7 am - 6.63 mmol/l, at 11 am - 7.11 mmol/l, at 4 pm - 11.30 mmol/l, at 8 pm - 3.23 mmol/l, at 3 am - 10.08 mmol/l, at 7 am - 9.77 mmol/l.

December 22-23, 2022 Blood sugar at 7 am - 5.5 mmol/l, 11 am - 6.08 mmol/l, 4 pm - 14.42 mmol/l, 03 am - 5.82 mmol/l, 07 am - 4.88 mmol/l.

PCR for hepatitis on December 12, 2022: HBV DNA was negative. HCV RNA was negative.

Abdominal ultrasound on December 8, 2023: The liver was enlarged, the left lobe was 73 mm thick, the right lobe was 173 mm thick. Craniocaudal dimension was195 mm. The contour was smooth. The structure was homogeneous, grooming was increased, symptom of "fading ultrasound". The spleen was enlarged, size: 121*37mm, S-57cm2. The contour was smooth. Additive lobule d 12mm. The structure was homogeneous, medium echogenicity. Spleen vein was not enlarged.

Intrahepatic bile ducts were not dilated. Vascular pattern was preserved. The hepatic veins were moderately dilated to 7 mm. The portal vein was 14 mm dilated. Gallbladder was located typically. The shape was oval. The wall was thin, the lumen was clear. The gallbladder was 89 x 30 mm in size, it was enlarged. The common bile duct was not enlarged. The pancreas was not enlarged. The contour was smooth. Dimensions of the pancreatic head were 18 mm, body was 8 mm, tail was 17 mm. The structure was homogeneous, with medium echogenicity.

The kidneys were located typically. The right kidney measures were 120 by 35mm. The contour was smooth. Parenchyma was 14 mm thick. Cortico-medullary differentiation preserved. Bowel-lacrimal system was not enlarged. The left kidney measured 118 by 41 mm. The contour was smooth. Parenchyma was additional 14mm. Cortico-medullary differentiation was preserved. Bowel-lobule system was not enlarged. Additionally: Bladder was empty. Conclusion: Hepatosplenomegaly, diffuse changes of liver parenchyma. Free fluid in the abdominal cavity.

Ultrasound examination of the thyroid gland on December 9, 2022: Thyroid gland V=4.44 cm3, length was 3.28 cm, thickness was 1.12 cm, width was 1.29 cm. The contour was smooth. Echostructure was homogeneous. Echocosity was medium. The isthmus was 0.21 cm. Regional lymph nodes were not enlarged.

Esophagogastroduodenoscopy on December 21, 2022: Esophageal mucosa was pink, shiny, moderately hyperemic in the lower third. The dentate line was clear. Cardia occluded. There was a small amount of secretory fluid in the gastric cavity. The gastric folds were of normal shape and height. The gastric mucosa in the antral part was stained hyperemic, in the descending part of the duodenum it was stagnant. Conclusions: Erythematous gastroduodenopathy expressed. Nonerosive reflux esophagitis.

Electrocardiogram dated December 13, 2022: Sinus rhythm, pronounced tachycardia. Heart rate was 105 beats per minute, electric axis of the heart was normal.

Electroneuromyography dated December 19, 2022: Syndrome of impaired absorption conduction along the median, ulnar, peroneal, and tibial nerves on both sides not detected.

Consultation of gastroenterologist, dated December 16, 2023: Toxic liver damage, proceeding according to the type of acute hepatitis. Without cholestasis.

Determination of infections by immunofluorescence analysis from December 16, 2022: Ebstein Barr virus - early immunoglobulin G (EA) antigens not detected; Ebstein Barr virus - nuclear immunoglobulin G (NA) antigen not detected.

On the basis of the complaints, medical history, clinical examination, biochemical tests (increased transaminases, alkaline phosphatase, total bilirubin), ultrasound examination of the liver (hepatosplenomegaly, diffuse changes in the liver parenchyma, free fluid in the abdomen), the clinical diagnosis was: Toxic liver injury, with the type of acute hepatitis (K 72.1). Diabetes mellitus type 1. Without complications (E 10.9).

Disintoxication and hepatoprotective therapy with positive effect was carried out in the department. Treatment was prescribed: ward regimen. Table #9, replacement therapy: 48-50 units/day (1 U/kg/day) - Degludek (Tresiba), 22 hours - 18 units, Insulin Aspart-Nicotinamide (Fiasp): 8 hours-10 units, 12 hours-10 units, 18 hours-10 units.

Infusion therapy with disintoxication purpose: plasmafusol 500 ml; physiological solution 0.9% - 300 ml intravenous drip.

Recommendations: diet table 9 with restriction of easily digestible carbohydrates with calculation of BE - the daily requirement - 18-20 BE/day. Blood glucose control in the morning on an empty stomach, before and 2 hours after each meal, before going to bed with a portable glucose meter or continuous blood glucose monitoring system (CMMS) and keeping a self-monitoring diary.

Insulin therapy in the basal-bolus regimen - insulin Degludek (Tresiba) and insulin aspart-nicotinamide (Fiasp) in accordance with the federal clinical guidelines: Breakfast 6XU - Fiasp 10IU, for glucose above 14 mmol/L, for glucose above 18 mmol/L. Lunch 6XU - Fiasp

10IU, for glucose above 14 mmol/L, for glucose above 18 mmol/L. Dinner 6XU - Fiasp 10IU, for glucose above 14 mmol/L, for glucose above 18 mmol/L. Tresiba 10 p.m. 18 IU.

Control of glucose and ketones in urine at glucose above 15 mmol/l and for intercurrent diseases, increase insulin dose if necessary.

In case of hypoglycemia (blood sugar below 3.9 mmol/l), take easily digestible carbohydrates for 1 CGU (a glass of juice, 4 pieces of raffinate), then after 15 minutes measure blood glucose, if the blood glucose is low again repeat carbohydrate intake.

Change of injection sites is recommended to avoid lipodystrophy formation.

Monitor glycated hemoglobin HbA 1c, blood chemistry, morning urine for microalbuminuria every 3 months.

With hepatoprotective purpose - Ursosan 500 mg once a day - a course of 1 month.

Control of biochemical blood tests (ALT, AST, LDH, creatinine, urea, total protein, gamma-glutamyl transpeptidase, bilirubin total, free, albumin) after 1 month. In case of negative dynamics of the biochemical blood test, hospitalization in the Department of Pediatric Endocrinology and Gastroenterology of the Pediatric Center of RB №1-NCM is recommended.

Conclusion: An interesting clinical case from the Department of Pediatric Endocrinology and Gastroenterology of Pediatric Center of the Republican Hospital No.1-NCM is described in the article. Cases of toxic hepatitis in children have been described in the literature. However, there are practically no articles describing cases of toxic hepatitis in children against the background of diabetes mellitus type 1. The article will be of interest to pediatricians.

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DOI 10.25789/YMJ.2023.83.30

УДК 616.433, 616.45, 616-005.1

ALTSHULER Natavan Elshad – MD, anesthesiologist and intensive care specialist, endocrinologist, assistant of the Department of Anesthesia and intensive care of Medico-biological University of Innovation and Continuing Education Federal Medical Biophysical Center A.I. Burnazyan. A.I. Burnasyan Federal Medical Biophysical Center FMBA, natavan.altschuler@gmail.com; **KUTCYI Mikhail Borisovich** – MD, anesthesiologist and intensive care specialist, chief of Operation center, European Medical Center, mkutsyy@gmail.com; **KRUGLYAKOV Nikolay Mihajlovich** – anesthesiologist and intensive care specialist, Head of Anesthesia and Intensive Care Service, A.I. Burnasyan Federal Medical Biophysical Center FMBA, nik160@mail.ru; **BAGZHANOV German Igorevich** – anesthesiologist and intensive care specialist, assistant of the Department of Anesthesia and intensive care of Medico-biological University of Innovation and Continuing Education, A.I. Burnazyan Federal Medical Biophysical Center FMBA, bag_g1992@gmail.com; **ANIKYEVA Evgeniya Anatolevna** – cardiologist, the European Medical Center; e-mail: ani_evg@mail.ru; **DOKUKIN Aleksey Anatolevich** – anesthesiologist and intensive care specialist. European Medical Center, gneezdo777@mail.ru; **POPUGAEV Konstantin Aleksandrovich** – MD, PhD, professor of intensive care, head of the Regional Vascular Center of the N.V. Sklifosovskii Research Institute for Emergency Medicine of Moscow Healthcare Department; head of the Department of Anesthesiology, Resuscitation Intensive Care, A.I. Burnasyan Federal Medical Biophysical Center FMBA Moscow, e-mail: stan.popugaev@yahoo.com

N.E. Altshuler, N.M. Kruglyakov, G.I. Bagzhanov, K.A. Popugaev, M.B. Kutcyi, E.A. Anikyeva, A.A. Dokukin

ADRENAL AND THYROID DYSFUNCTION IN NON-TRAUMATIC SUBARACHNOID HEMORRHAGE REQUIRING THERAPEUTIC NORMOTHERMIA. CLINICAL OBSERVATION

Subarachnoid hemorrhage (SAH) is a life-threatening variant of hemorrhagic stroke. Therapeutic normothermia to reduce the risk of adverse outcomes. At the same time, the initially existing decompensation of body systems, followed by induced normothermia, gives impetus to the development of a number of pathophysiological processes in the human body. **Objective.** Timely detection and adequate correction of endocrinopathy of critical illness in patients in the most acute period of SAH against the background of therapeutic normothermia with a target temperature regime of 36 °C. **Materials and methods.** A 57-year-old patient with a diagnosis of non-traumatic subarachnoid hemorrhage, saccular aneurysm of the anterior communicating artery and anterior cerebral artery, Hunt Hess III. **Results.** The development of critically ill adrenal dysfunction considered based on the need for vasopressors. Thyroid dysfunction caused by a critical illness considered with a decrease in the level of TSH and free T3 in blood plasma against the background of therapeutic normothermia, the development of intestinal dysfunction and sinus bradycardia. **Conclusions.** Against the background of the introduction of hydrocortisone at an initial dose of 300 mg, the administration of norepinephrine discontinued on the third day. When levothyroxine sodium 300 mcg/day added to therapy, intestinal dysfunction resolved, normal resting heart rate achieved.

Keywords: critical illness, hypothyroidism, thyrotropin, thyroid hormones, thyroxine, triiodothyronine, extracorporeal membrane oxygenation, targeted temperature management, cortisol, adrenocorticotropic hormone.

Introduction. Subarachnoid hemorrhage (SAH) is a life-threatening variant of hemorrhagic stroke [1]. In the acute period of SAH, among other methods of treatment, aggressive correction of hyperthermia and maintenance of normothermia using specialized TTM body temperature control systems are justified [15]. Prophylactic normothermia is recommended for patients with a poor prognosis of SAH (Hunt-Hess 111-V) [6]. TTM, which has actively used over the