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PARENTERAL RARE ACUTE VIRAL HEPATITIS D AND G: MODERN DIAGNOSIS, PREVENTION, AND TREATMENT

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Abstract: The diagnostic challenges, clinical features, treatment options, and prevention strategies for acute viral hepatitis with parenteral transmission mechanisms (specifically hepatitis D and G), which comprise a small proportion of all acute viral hepatitis cases, are discussed in this study. The widespread occurrence of these infections, combined with advancements in modern diagnostic techniques and the high frequency of progression to chronic forms, underscores the significance of addressing viral hepatitis as a critical issue for public health, particularly within the context of domestic healthcare systems.

The article provides an overview of the importance of serological markers for hepatitis D and G viruses, presenting an analysis of their clinical interpretation. In-depth discussions on modern pharmacological treatments, including interferon-based therapies, are included. Additionally, the necessity for specific preventive measures, post-exposure prophylaxis, and passive immunization strategies are thoroughly considered.

In some instances, subclinical infections may progress to rapidly advancing chronic liver diseases, eventually leading to cirrhosis or hepatocellular carcinoma. Following an incubation period of variable length, viral replication within liver cells reaches its peak, resulting in the presence of viral components in bodily fluids and excreta. This process induces hepatocyte necrosis and triggers an inflammatory response, clinically manifesting as liver damage, accompanied by corresponding laboratory abnormalities. The host's immunological response plays a pivotal, albeit not fully understood, role in the pathogenesis of the disease.

Acute viral hepatitis with parenteral transmission ranks among the most significant infectious diseases in Uzbekistan, primarily due to its high prevalence, severe clinical course, and frequent progression to chronic forms. Addressing this urgent public health concern is intrinsically tied to advancements in the diagnosis, prevention, and treatment of acute viral hepatitis.

Keywords: a hepatites B, C, D, G; a virus of a hepatites B, C, D, G; methods diagnostics, clinic, drug treatment,preventive maintenance.

Diagnosis of Acute Viral Hepatitis

Early diagnosis of acute viral hepatitis (AVH) often relies on clinical and biochemical studies. Key factors for diagnosing hepatitis B, C, D, and G include:

- A history of blood transfusions or component therapy.
- Parenteral procedures.
- Chronic hemodialysis.
- Repeated injections or prolonged hospital stays.

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- Intravenous drug use.
- Potential sexual transmission.

Clinical Criteria

Special attention should be paid to the cyclic nature of the disease's manifestations and the duration of individual symptoms. Observing how the symptoms of the pre-icteric phase evolve with the onset of jaundice is crucial.

Functional Criteria

Early diagnosis in the pre-icteric stage, as well as the detection of anicteric and subclinical forms, can be aided by assessing the activity of alanine aminotransferase (ALT), aspartate aminotransferase (AST), and aldolase. A significant increase in ALT levels is characteristic. Bilirubin appears in the urine, and its serum concentration typically rises with the development of clinical symptoms.

Serological Markers

A definitive diagnostic criterion involves the detection of serological markers specific to the various etiological variants of acute hepatitis.

Virus	Marker	Significance
Hepatitis D (HDV)	Delta Ag	Indicates active replication of HDV and acute infection.
	anti-HDV IgM	Marker of acute or active HDV infection.
	anti-HDV IgG	Indicates previous HDV infection and potential persistent infection.
Hepatitis G (HGV)	anti-HGV	Suggests past HGV infection and the development of immunity.

Role of Liver Biopsy

Liver biopsy is not routinely required for diagnosing AVH. It is indicated only in atypical cases, such as a protracted disease course, persistent symptoms, or abnormal laboratory findings.

Liver Biopsy Indications

Liver biopsy is recommended in cases where elevated aminotransferase levels persist for more than four weeks, coupled with continued detection of HBsAg for over 16 weeks. This symptom complex raises suspicion of a possible transition to chronic hepatitis. Biopsy is also considered when aminotransferase elevation is mild and persistent, as it helps clarify the diagnosis.

Differential Diagnosis

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Anicteric and Subclinical Forms

Anicteric and subclinical forms of acute hepatitis must be distinguished from conditions such as gastritis, enterocolitis, and enteroviral infections. Key diagnostic features include clinical and laboratory signs of liver damage.

Icteric Form

The icteric form of acute viral hepatitis (AVH) can be challenging to differentiate from acute toxic or allergic hepatitis caused by medications such as MAO inhibitors, tuberculostatic drugs, and sulfonamides. A thorough patient history detailing the use of hepatotoxic drugs is crucial for diagnosis.

Cholestatic Form

Differentiating the cholestatic form of AVH from obstructive jaundice can be particularly difficult. In some cases, clinical and biochemical markers are insufficient. Diagnostic certainty often requires advanced imaging techniques such as duodenoscopy with retrograde cholangiopancreatography or percutaneous cholangiography.

Alcoholic Hepatitis

Significant challenges may arise when distinguishing AVH from acute alcoholic hepatitis. Knowledge of extrahepatic signs of alcohol intoxication is invaluable in such cases. When uncertainty persists, a liver biopsy is performed. Findings suggestive of alcoholic hepatitis include:

- Centrilobular necrosis of hepatocytes.
- Presence of Mallory bodies (alcoholic hyaline) within the cytoplasm.
- Inflammatory infiltrates in portal tracts predominantly composed of polymorphonuclear leukocytes.

Clinical Relevance

Effective differentiation between AVH and other hepatic conditions ensures accurate diagnosis and appropriate management. Advanced diagnostic tools and detailed patient history remain essential for resolving diagnostic challenges.

Acute viral hepatitis (AVH) is an infectious disease characterized by acute necrosis and inflammation of the liver caused by hepatitis viruses A, B, C, D, E, and G. Hepatitis A and E are classified as enteral infections, transmitted via the fecal-oral route. In contrast, hepatitis B, C, D, and G belong to the group of parenteral hepatitis. Regardless of the specific virus involved, liver damage is central to the clinical picture, and the disease generally follows a cyclic course.

Additionally, liver involvement is known to occur in the context of systemic infections caused by other viruses, such as cytomegalovirus, Epstein-Barr virus, adenovirus, echovirus, and TTV [1]. The clinical manifestations range from subclinical forms to rapidly progressive

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and fatal outcomes. In most cases, the disease is self-limiting and uncomplicated. However, the frequency of extrahepatic manifestations and progression to chronic liver disease varies depending on the viral agent.

HEPATITIS G

As early as 1975, it was discovered [7] that the serum of a surgeon (with the initials "GB") suffering from acute hepatitis, when intravenously injected into tamarins—small South American monkeys—caused acute hepatitis. With the advent of new research methods, hepatitis A, B, and C were sequentially excluded as causes of this disease. In April 1995, [8] a report was made regarding the molecular properties of a viral-like RNA identified in the plasma of GB-infected tamarins during the acute phase of the infection. A similar viral agent, designated as HCV, was independently isolated in a study [9] from the plasma of a patient with chronic hepatitis C. Research revealed that the genome of this pathogen is similar to that of the flavivirus family. The genome of HGV is structurally similar to that of HCV, meaning the structural genes are located at the 5' end of the genome, while the non-structural genes are at the 3' end. Currently, there is no serological test for diagnosing active HGV infection. HGV infection can only be detected by identifying HGV RNA through polymerase chain reaction (PCR). Anti-E2 antibodies in hepatitis G can be used to register past infections and assess the spread of the infection in various population groups.

Clinical Features. Acute hepatitis G typically presents in a clinically mild and asymptomatic form. It is characterized by moderate elevation of serum transaminase activity. Recent reports suggest that HGV can cause rapidly progressing acute hepatitis. According to [10], fulminant hepatitis caused by GBV-C (HGV) is characterized by relatively slow progression of liver failure (ranging from 16 to 45 days), significant fluctuations in transaminase activity, and high mortality (5 out of 6 patients died). A clinical feature of HGV infection is the development of biochemical cholestasis syndrome with elevated γ-GT and alkaline phosphatase (ALP) levels [11, 12]. HGV may cause specific damage to the bile ducts with intrahepatic cholestasis syndrome.

Diagnosis. The diagnosis is based on the detection of GBV-C/HGV RNA, indicating its replication, and anti-HGV antibodies (anti-E2, antibodies against the envelope antigen), which suggest immunity. The outcome of acute hepatitis G can be recovery; in rare cases, it is assumed to lead to chronic hepatitis with the persistence of HGV RNA for several years, followed by its disappearance and the appearance of anti-HGV antibodies, leading to the establishment of long-term HGV carrier status. Descriptions of chronic hepatitis G cases exist, but their numbers are extremely few. Further research is needed to clarify the true significance of HGV as a "bystander" or as a factor playing a specific role in the chronicization of the liver process.

Clinical Features

Simultaneous infection with HBV and HDV (co-infection) leads to the development of acute hepatitis of mixed etiology. The incubation period is the same as for HBV (1.5 to 6 months). The pre-jaundice period is characterized by a more acute course with early symptoms of intoxication. Typical symptoms include high fever, arthralgia, and possible pain in the liver area. In the jaundice phase, symptoms of intoxication increase, liver pain intensifies, and

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splenomegaly is noted. A distinctive feature of mixed infection is the occurrence of clinical-enzymatic or purely enzymatic exacerbations between the 15th and 32nd day of illness. In such cases, AST activity is higher than ALT activity, and the thymol test is also elevated, which is not typical for acute hepatitis. In co-infection, the delta antigen can be detected in the serum of patients 4 to 7 days after jaundice appears and for 1 to 2 weeks thereafter. HDV RNA is typically detected simultaneously with the delta antigen.

Diagnosis

The presence of HDV infection is reflected by the detection of anti-HDV IgM antibodies. During the peak of the disease and during convalescence, anti-HDV IgG antibodies are detected. In almost all cases, HBsAg and anti-HBc IgM antibodies are also present in the serum. Patients may remain HBsAg-negative in cases of fulminant hepatitis D. Persistence of anti-HDV IgM correlates with the activity of HDV infection and liver damage. Acute viral hepatitis D in HBsAg carriers is a superinfection characterized by a shorter incubation period (1 to 2 months), an acute onset with right upper quadrant pain, fever, intensifying clinical symptoms as jaundice appears, along with edema-ascitic syndrome, impaired protein synthesis by the liver, and the presence of anti-delta IgM or delta antigen. Alongside HBsAg, anti-HBe and anti-HBc IgM antibodies appear. The disease often follows a multi-wave course, with repeated clinical-enzymatic exacerbations.

TREATMENT

Management of Acute Viral Hepatitis (AVH)

Patients with AVH in our country are hospitalized in infectious disease departments and hospitals. During the acute phase of the disease, bed rest is prescribed. The duration of hospital stays ranges from 2–4 to 6 weeks and even several months, depending on the severity of the disease. Most patients in the USA and Europe are not hospitalized and are observed at home. Rest is recommended, but strict bed rest is not mandatory if the patient does not experience significant weakness.In-home care requires appropriate medical supervision. Examinations are conducted 2–3 times in the first week of the disease and then at longer intervals. Biochemical tests are performed twice a week during the first 2 weeks of the disease. Immediate hospitalization is required in cases of anorexia and/or vomiting or worsening biochemical indicators.Adherence to bed rest is particularly important in cases of severe clinical symptoms, prolonged hyperbilirubinemia for more than 2–3 weeks, a decrease in the prothrombin index, and for weakened patients and individuals over the age of 40.Alcohol and all medications, especially narcotics, analgesics, and tranquilizers, must be excluded. Sedative medications should also not be prescribed, as their metabolism by liver cells is impaired. The use of oral contraceptives is prohibited.Special dietary restrictions are not required for patients with mild and moderate severity of the disease. For most patients, a diet low in fat and high in carbohydrates is recommended. Diet No. 5 is advised, along with sufficient fluid intake (up to 1.5–2 liters per day), which can include Borjomi, Essentuki No. 4, 17, Mirgorod, and other mineral waters.In severe cases during the acute phase, anorexia and nausea may be so pronounced that oral food intake is minimal. In such cases, monitoring of the water-electrolyte balance is necessary; frequent small portions of liquid are desirable. For severe nausea, medications that normalize gastrointestinal motility (Cerucal, Motilium, Cisapride) are recommended. Parenteral infusion therapy with detoxification purposes is indicated. Intravenous infusions of Ringer's solution and 5%

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glucose solution are administered, totaling up to 2 liters per day. Under the control of pH and the electrolyte composition of the blood, necessary corrections are made:

- In pronounced alkalosis, a 5% solution of ascorbic acid is used.
- In pronounced acidosis, a 3% sodium bicarbonate solution (50–100 ml) is administered.

Medication therapy should be minimal. Administration of vitamins B1, B2, B6, and B12 injections is not indicated without specific deficiencies. Ascorbic acid and Riboxin are used as nonspecific immunostimulants.

Hepatitis D

The main challenges arise with HDV/HBV superinfection. Interferon-alpha was first used empirically 25 years ago and remains the only recommended drug to date. Clinical trials have shown that the efficacy of interferon (normalization of ALT levels and disappearance of HDV-RNA) is proportional to the dose of IFN [13].In HDV/HBV superinfection, hepatitis D is usually diagnosed at the chronic stage. Overall, standard treatment for 1 year in patients with active chronic hepatitis D has led to disease remission in approximately 20% to 25% of cases. Extending therapy with conventional IFN to 2 years did not improve treatment efficacy. Pegylated interferon (Peg-IFN) may be a more effective treatment option [14].Interferon preparations slow the progression of the disease; the course of therapy lasts 12 months or more.

HGV Infection

HGV infection is sensitive to alpha-interferon.

Patients with fulminant forms of AVH and signs of hepatic encephalopathy are transferred to intensive care units, where not only central venous pressure, pH, blood glucose, and electrolytes are monitored, but intracranial pressure is also measured if necessary.

Prevention

Unlike hepatitis A and E, hepatitis B, C, D, and G are not typically transmitted through the fecal-oral route, although secretions from infected individuals should be considered potentially infectious. The virus transmission is significant through needlestick injuries with contaminated needles (or equivalent contact with infected materials) or intimate personal, particularly sexual, contacts, especially during HBsAg positivity.

The prevention of serum hepatitis involves mechanical cleaning and effective sterilization of medical instruments. For each procedure (vaccination, diagnostic tests), reliably sterilized needles and syringes should be used. An essential task is ensuring that healthcare facilities are supplied with single-use syringes. Proper monitoring of blood donors is also critical.

An effective measure to prevent post-transfusion hepatitis is medically justified limitation of blood transfusions and its components.

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Post-Contact Prophylaxis and Passive Immunization

Hepatitis D

There are no developed methods for active and passive immunization against hepatitis D. Since the development of HDV infection requires prior or simultaneous infection with HBV, vaccination against hepatitis B is conducted. Vaccination against hepatitis B provides protection against HDV.

Literatures:

1. Matsumoto A., et al. Transfusion-associated TT virus infection and its relationship to liver disease // Hepatology. — 1999. — 30:283 – 288.
2. Carman W., Thomas H., Domingo E. Viral genetic variation: Hepatitis B virus as a clinical example // Lancet. — 1993. — Vol. 341. — P. 349 – 356.
3. Houghton et al.
4. Van der Poel C. L., Cuypers T. H., Reesink H. W. Hepatitis C virus six years on // Lancet. — 1994. — Vol. 344. — P. 267 – 269.
5. Simmonds P., Alberti A., Alter H. J. et al. A proposed system for the nomenclature of hepatitis C viral genotypes // Hepatology. — 1994. — Vol. 19. — P. 1321 – 1325.
6. Шахгильдян И. В., Михайлов М. И., Онищенко Г. Г. Парентеральные вирусные гепатиты (эпидемиология, диагностика, профилактика). — М., 2003. — 383 с.
7. Deinhardt F., Peterson D., Gross G., Wolfe Lholmes A. W. Hepatitis in marmosets // Am. J. Med. Sci. — 1975. — Vol. 270. — P. 73 – 80.
8. Simons J. N., Pilot-Martias T. J., Leary T. P., Dawson G. T., Desai S. M., Schlauder G. G. et al. Identification of two flavivirus-like genomes in the GB hepatitis agent // Proc. Nat. Acad. Sci. USA. — 1995. — Vol. 92. — P. 3401 – 3405.
9. Linnen J., Wages J., Zhang-Keck Z. et al. Molecular Cloning and Disease Association of Hepatitis G Virus: A Transfusion-Transmissible Agent / Hepatitis GB-Virus GBV-C // Selected Bibliography, Science. — 1996. — Vol. 271. — P. 43 – 47.
10. Yoshiba M., Okamoto H., Mishiro Sh. Detection of the GBV-C hepatitis virus genome in serum from patients with fulminant hepatitis of unknown aetiology // Lancet. — 1995. — Vol. 436. — P. 1131 – 1132.
11. Campo S., Craxi A., Di Marlo V., Tringali A. Hepatitis G Virus: a Cause of Cryptogenic Liver Disease // J. of Hepatology EASL Supplement. — 1996. — Vol. 25, № 1. — P. 79 – 87.
12. Colombatto P., Randone A., Montigorin G. et al. Hepatitis G virus RNA in patients with elevated GGT and alkaline phosphatase: a specific liver disease? // J. of Hepatology EASL Supplement. — 1996. — Vol. 25, № 1. — P. 57.
13. Niro G. A., Rosina F., Rizzetto M. Treatment of hepatitis D // J Viral Hepat. — 2005. — 12:2 – 9.
14. Yurdaydin C. et al. Efficacy of pegylated interferon-based treatment in patients with cirrhosis due to chronic delta hepatitis: comparison with non-cirrhotic patients // Hepatology. — 2009. — 50:736A. (Abstr 916).
15. Poovorawan Y. et al. Protective efficacy of a recombinant DNA hepatitis B vaccine in neonates of HBe antigen-positive mothers // JAMA, — 1989. — 261:3278 – 3281.

ISSN: 2692-5206
AMERICAN ACADEMIC PUBLISHER
INTERNATIONAL JOURNAL OF MEDICAL SCIENCES

16. Шарипова О.А., Бахронов Ш.С., Алиакбарова Х.И., Бахронов Ж.Ж. G3O8A полиморфизм гена tnf-a в развитии рецидивного бронхита у детей и его влияние на синтез tnf-a // Amaliy va tibbiyot fanlari ilmiy jurnali. – Vol. 3 No. 2 (2024): WOM. pp 269-275
17. Bakhronov J. J., Kholmurodov Sh. F., Yakhyaeva Kh. D., Kuchkorov Sh. B. The role of artificial intelligence in modern medicine // Innovations in Technology and Science Education. – Vol. 2 No. 7 (2024): WOM. pp 464-467
18. Bakhronov Jakhongir, Muhiddinzoda Rukhshonabonu, Nigmatullaev Muhammadjon, Kuddusov Muslimbek, & Jamoliddinov Sherali (2023). HEPATITIS C IN PREGNANT WOMEN AND NEWBORNS. Вестник магистратуры, (7 (142)), 10-12.
19. Bakhronov , J. J., Otakulov , D. A. ugli, & Nigmatullaev , M. N. (2023). GILBERT'S SYNDROME: CURRENT INSIGHTS, OUTCOMES AND THERAPIES. GOLDEN BRAIN, 1(16), 131–135.
20. Muhiddinzoda Rukhshonabonu, Bakhronov Jakhongir, Ubaydullaev Sardor, Kuddusov Muslimbek, Kuchkorov Shakhzodbek, Nigmatullaev Muhammadjon, Jamoliddinov Sherali, & Kakharov Shakhriyor (2023). CLINICAL MANIFESTATION OF LENNOX-GASTAUT SYNDROME. Вестник магистратуры, (7 (142)), 19-21.
21. Ne'matov H.A., Bhavya Shah. Determination of the incident level of chronic viral hepatitis among the population of Oqdaryo district (Samarkand region) // Web of Medicine: Journal of Medicine, Practice and Nursing. –Vol. 2 No. 5 (2024): WOMpp 16-18
22. Namozovich, Rakhmonov Ravshan, and Kardzhavova Gulnoza Abilkasimovna. "An Integrated Approach to the Treatment of Community-Accompany Pneumonia in Children 2ith Myocarditis." EUROPEAN JOURNAL OF MODERN MEDICINE AND PRACTICE 4.2 (2024): 84-97. https://inovatus.es/index.php/ejmmp/article/view/2420
23. Rakhmonov Ravshan Namozovich, Mansurov Jasur Choriyor ugli, Sobirov Og'abek Sobir ugli ugli, & Allanazarov Alisher Boymuratovich. (2024). Acute Obstructive Bronchitis in Children: Main Etiological and Clinical Features. EUROPEAN JOURNAL OF MODERN MEDICINE AND PRACTICE, 4(2), 98–100.
24. Rakhmonov Ravshan Namozovich et al. 2024. An Integrated Approach to the Treatment of Community-Accompany Pneumonia in Children 2ith Myocarditis. EUROPEAN JOURNAL OF MODERN MEDICINE AND PRACTICE. 4, 2 (Feb. 2024), 84–97.
25. Nomozovich, R.R. 2024. Parenteral Acute Viral Hepatitis B and C: Modern Diagnosis, Prevention, and Treatment. Journal of Science in Medicine and Life. 2, 12 (Dec. 2024), 16–26.