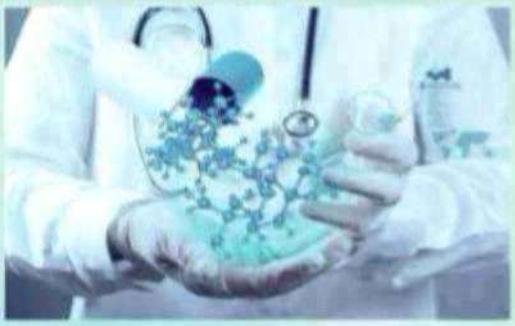
New Day in Medicine
Новый День в Медицине
NDM

TIBBIYOTDA YANGI KUN

Ilmiy referativ, marifiy-ma'naviy jurnal



AVICENNA-MED.UZ

ISSN 2181-712X.
EiSSN 2181-2187

5 (79) 2025

ТИББИЁТДА ЯНГИ КУН
НОВЫЙ ДЕНЬ В МЕДИЦИНЕ
NEW DAY IN MEDICINE

Илмий-рефератив, маънавий-маърифий журнал
Научно-реферативный,
духовно-просветительский журнал

УЧРЕДИТЕЛИ:

БУХАРСКИЙ ГОСУДАРСТВЕННЫЙ МЕДИЦИНСКИЙ ИНСТИТУТ
ООО «ТИББИЁТДА ЯНГИ КУН»

Национальный медицинский исследовательский центр хирургии имени А.В. Вишневского является генеральным научно-практическим консультантом редакции

Журнал был включен в список журнальных изданий, рецензируемых Высшей Аттестационной Комиссией Республики Узбекистан (Протокол № 201/03 от 30.12.2013 г.)

5 (79)

2025

май

www.bsmi.uz
https://newdaymedicine.com E:
ndmuz@mail.ru
Тел: +99890 8061882

Received: 20.04.2025, Accepted: 06.05.2025, Published: 10.05.2025

UDC 616.988–053.2–022.6 (075.8)

OPTIMIZATION OF MODERN THERAPY FOR CMV-INFECTION AND INFECTIOUS MONONUCLEOSIS

Jalilova Aziza Sadilloevna https://orcid.org/0009-0004-6234-4631
E-mail: jalilova.aziza@bsmi.uz

Bukhara State Medical Institute named after Abu Ali ibn Sina, Uzbekistan, Bukhara, st. A. Navoi. 1 Tel: +998 (65) 223-00-50 e-mail: info@bsmi.uz

✓ ***Resume***

Cytomegalovirus (CMV) infection and infectious mononucleosis, commonly caused by Epstein–Barr virus (EBV), are widespread viral illnesses with significant clinical implications, especially in immunocompromised individuals. This article reviews the pathogenesis, clinical manifestations, and current therapeutic strategies for these infections, and explores modern approaches for optimizing treatment, including immunomodulatory agents, antivirals, and supportive care.

Keywords: CMV, Epstein–Barr virus, infectious mononucleosis, antiviral therapy, immunomodulation, treatment optimization.

ОПТИМИЗАЦИЯ СОВРЕМЕННОЙ ТЕРАПИИ ПРИ CMV-ИНФЕКЦИИ И ИНФЕКЦИОННОМ МОНОНУКЛЕОЗЕ

Джалилова Азиза Садиллоевна https://orcid.org/0009-0004-6234-4631
E-mail: jalilova.aziza@bsmi.uz

Бухарский государственный медицинский институт имени Абу Али ибн Сины, Узбекистан, г. Бухара, ул. А. Навои. 1 Тел: +998 (65) 223-00-50 e-mail: info@bsmi.uz

✓ ***Резюме***

Цитомегаловирусная (CMV) инфекция и инфекционный мононуклеоз, наиболее часто вызываемый вирусом Эпштейна–Барр (EBV), являются широко распространёнными вирусными заболеваниями, имеющими значительное клиническое значение, особенно у лиц с иммунодефицитом. Эти инфекции могут вызывать широкий спектр клинических и иммунологических осложнений, включая поражение печени и нарушение иммунной регуляции. В данной статье рассмотрены патогенез, клинические проявления и современные терапевтические подходы к лечению CMV и EBV-инфекций. Особое внимание уделено современным методам оптимизации терапии, включая противовирусные препараты, иммуномодуляторы и персонализированную поддерживающую терапию. Подчёркивается важность своевременной диагностики, иммунологического мониторинга и комплексного подхода к лечению для улучшения клинических результатов и профилактики осложнений.

Ключевые слова: цитомегаловирус, вирус Эпштейна–Барр, инфекционный мононуклеоз, противовирусная терапия, иммуномодуляция, оптимизация лечения.

CMV-INFEKSIYA VA INFEKSION MONONUKLEOZDA ZAMONAVIY TERAPIYANI OPTIMALLASHTIRISH

Jalilova Aziza Sadilloevna https://orcid.org/0009-0004-6234-4631
E-mail: jalilova.aziza@bsmi.uz

Abu Ali ibn Sino nomidagi Buxoro davlat tibbiyot instituti, O‘zbekiston, Buxoro sh. A. Navoiy kochasi 1 Tel: +998 (65) 223-00-50 e-mail: info@bsmi.uz

✓ ***Rezyume***

Sitomegalovirus (CMV) infeksiyasi va Epshteyn–Barr virusi (EBV) bilan bog‘liq infeksion mononukleoz keng tarqalgan virusli kasalliklar bo‘lib, ayniqsa immuniteti pasaygan shaxslarda jiddiy klinik oqibatlarga olib kelishi mumkin. Ushbu infeksiyalar turli klinik va immunologik asoratlarga, jumladan jigar faoliyatining buzilishi va immun regulyatsiyaning o‘zgarishiga sabab bo‘ladi. Mazkur maqolada CMV va EBV infeksiyalarining patogenezi, klinik belgilar va amaldagi davolash usullari ko‘rib chiqiladi. Shuningdek, zamonaviy terapiyani optimallashtirishning dolzarb yondashuvlari — antivirus vositalar, immunomodulyatorlar va individual qo‘llab-quvvatlovchi davolash haqida so‘z yuritiladi. O‘z vaqtida tashxis qo‘yish, immun holatni monitoring qilish va kompleks davolovchi yondashuv klinik natijalarni yaxshilash va uzoq muddatli asoratlarning oldini olishda muhim o‘rin tutishi ta’kidlanadi.

Kalit so‘zlar: sitomegalovirus, Epstayn–Barr virusi, infeksion mononukleoz, antivirus terapiya, immunomodulyatsiya, davolashni optimallashtirish.

Relevence

Cytomegalovirus (CMV) and Epstein–Barr virus (EBV) are ubiquitous human herpesviruses that establish lifelong latency after primary infection and may cause a wide range of clinical manifestations depending on the host's immune status [1]. CMV infection is particularly prevalent among immunocompromised populations, including organ transplant recipients, patients undergoing chemotherapy, individuals with HIV/AIDS, and newborns with congenital infection, where the virus can cause severe multisystem involvement, including pneumonitis, retinitis, colitis, and encephalitis. In immunocompetent individuals, CMV may remain asymptomatic or present as a mononucleosis-like syndrome, characterized by prolonged fever, malaise, and atypical lymphocytosis, but often lacking pharyngitis and lymphadenopathy, which distinguishes it from EBV-related infectious mononucleosis[2].

Epstein–Barr virus, on the other hand, is the primary etiologic agent of classical infectious mononucleosis, predominantly affecting adolescents and young adults, and presenting with the well-known triad of fever, pharyngitis, and lymphadenopathy, along with hepatosplenomegaly and elevated liver enzymes in many cases[3]. Beyond acute infection, EBV is implicated in the pathogenesis of several lymphoproliferative disorders and epithelial malignancies, making it a virus of considerable clinical and oncological relevance [4]. Both CMV and EBV have evolved complex immune evasion strategies that enable persistent infection and episodic reactivation, which may be subclinical or associated with disease exacerbation [5].

The increasing incidence of opportunistic viral infections due to the growing use of immunosuppressive therapies and the expanding population of immunocompromised patients has brought renewed attention to the need for more effective, targeted, and individualized therapeutic approaches [6]. While supportive care remains the mainstay of treatment in mild cases, especially among immunocompetent individuals, there is a pressing need to optimize antiviral regimens, incorporate immune-based interventions, and establish prophylactic strategies, particularly in high-risk groups [7]. Moreover, the emergence of antiviral resistance, limitations in vaccine development, and challenges in early diagnosis further complicate the management of these infections. Therefore, the optimization of modern therapy for CMV infection and infectious mononucleosis requires a comprehensive understanding of their virology, immunopathogenesis, clinical spectrum, and current treatment modalities, as well as the integration of novel therapeutic advances aimed at improving patient outcomes [8].

The purpose of the study: Study of optimization of modern therapy for cmv-infection and infectious mononucleosis.

Materials and methods

This prospective clinical study was conducted at the Bukhara Infectious Diseases Hospital over a two-year period, from 2022 to 2024, with the aim of optimizing modern therapeutic strategies for patients diagnosed with cytomegalovirus (CMV) infection and Epstein–Barr virus (EBV)-associated infectious mononucleosis. A total of 120 patients aged between 18 and 75 years were enrolled in the study based on confirmed clinical and laboratory diagnoses.

Inclusion criteria comprised patients with laboratory-confirmed primary CMV or EBV infection, based on the presence of specific IgM antibodies and/or detection of viral DNA using polymerase chain reaction (PCR) in blood samples. Clinical diagnosis was supported by typical symptoms such as prolonged fever, fatigue, lymphadenopathy, hepatosplenomegaly, and elevated liver enzymes.

All patients underwent comprehensive clinical and laboratory evaluation. Hematological parameters including complete blood count (CBC), biochemical liver function tests (ALT, AST, bilirubin), and inflammatory markers (CRP, ESR) were analyzed using standard automated analyzers. Immunological assessments included flow cytometric analysis of peripheral blood lymphocyte subsets (CD3+, CD4+, CD8+, CD16+, CD20+, CD25+, and CD95+). Serum levels of Interleukin-4 (IL-4) and Interleukin-17A (IL-17A) were determined using ELISA kits according to the manufacturer's protocols.

Hepatic condition was assessed by abdominal ultrasound and FibroScan elastography in patients with signs of liver involvement. Antiviral therapy (e.g., ganciclovir or valganciclovir for CMV), supportive care, and immunomodulatory agents were administered according to the clinical condition and immune status of the patients. All patients were monitored dynamically for 4 to 6 weeks with follow-up laboratory and clinical evaluations.

Result and discussions

A total of 120 patients diagnosed with either cytomegalovirus (CMV) infection or Epstein–Barr virus (EBV)-associated infectious mononucleosis were included in the study. Among them, 68 (56.7%) were female and 52 (43.3%) were male. The majority of cases (72.5%) occurred in the age group of 18–40 years, with a mean age of 34.2 ± 11.6 years.

Clinically, the most common symptoms observed in both groups included prolonged fever (93.3%), fatigue (81.7%), lymphadenopathy (78.3%), hepatomegaly (45.8%), and splenomegaly (33.3%). Patients with EBV infection were more likely to present with pharyngitis and cervical lymphadenopathy, whereas patients with CMV infection frequently exhibited subacute hepatitis without significant lymph node enlargement.

Laboratory analysis revealed that 87.5% of patients had leukocytosis with relative lymphocytosis, and atypical lymphocytes were detected in 69.2% of blood smears. Elevated liver enzymes (ALT and AST) were present in 61.7% of patients, with moderate hyperbilirubinemia observed in 18.3%.

Immunophenotyping demonstrated significant changes in lymphocyte subsets. A reduction in CD4+ T-helper cells and an increase in CD8+ cytotoxic T cells were observed in acute stages, leading to a decreased CD4/CD8 ratio, particularly in patients with CMV infection. Natural killer (NK) cells (CD16+) and B-lymphocytes (CD20+) were moderately elevated in both groups. Importantly, activated T-cell markers such as CD25+ and CD95+ showed a marked increase in the acute phase, reflecting active immune engagement.

Cytokine analysis revealed elevated serum levels of IL-4 and IL-17A, with IL-17A being significantly higher in patients with CMV infection ($p < 0.05$), suggesting a more pronounced pro-inflammatory response. IL-4 levels were higher in EBV-associated cases, indicating a Th2-skewed immune profile.

Ultrasound and FibroScan findings showed signs of hepatic steatosis and early-stage fibrosis in 26.7% of patients, mainly in those with CMV-related hepatitis. No cases of advanced fibrosis or cirrhosis were recorded.

Therapeutic response was favorable in most patients. Antiviral treatment (valganciclovir for CMV) led to clinical improvement in 91.2% of cases within 2–3 weeks, while supportive care alone was sufficient for EBV mononucleosis. Immunomodulatory therapy, including antioxidants and hepatoprotective agents, contributed to normalization of liver enzymes and cytokine levels within 4–6 weeks.

No mortality was recorded during the observation period, and complications were limited to mild hepatitis and prolonged fatigue in a subset of patients. No cases of chronic active infection or severe organ damage were documented.

Conclusion

The results of this clinical study conducted at the Bukhara Infectious Diseases Hospital between 2022 and 2024 demonstrate that both cytomegalovirus (CMV) infection and Epstein–Barr virus (EBV)-associated infectious mononucleosis can lead to significant immunological and hepatic changes,

particularly in adults aged 18 to 40 years. While EBV infection typically presents with pharyngitis and lymphadenopathy, CMV is more commonly associated with subclinical or overt hepatitis. The immunological findings, including altered T-cell subpopulations and elevated pro-inflammatory cytokines, highlight the importance of immune monitoring during the acute phase of infection.

Timely administration of antiviral therapy in CMV cases, along with supportive and immunomodulatory treatment, was effective in reducing clinical symptoms and normalizing laboratory parameters. EBV-associated infectious mononucleosis, on the other hand, generally required only symptomatic management. The use of liver ultrasound and FibroScan helped detect early hepatic involvement and allowed for personalized hepatoprotective strategies.

In conclusion, optimizing the treatment of CMV and EBV infections involves early diagnosis, appropriate antiviral or supportive therapy, and monitoring of immune and hepatic status. These measures are essential for improving clinical outcomes, preventing complications, and reducing the burden of viral infections in both immunocompetent and immunocompromised patients.

LIST OF REFERENCES:

1. Авдеева М. Г., Намитоков Х. А., Полянский А. В., Триско А. А. Особенности современного течения инфекционного мононуклеоза у взрослых // Инфекционные болезни. 2009;7(2):22-25.
2. Адеишвили П. С., Шамшева О. В., Гусева Н. А. и др. Современные представления о поражении ротоглотки при инфекционном мононуклеозе // Детские инфекции. 2012;11(3):42-45.
3. Антонова М.В., Любимцева О.А., Кашуба Э.А. и др. Клинические картина инфекционного мононуклеоза Эпштейна-Барр вирусной этиологии в возрастном аспекте // Академический журнал Западной Сибири. 2014;10(5):65-66.
4. Jalilova, A.S. (2022). The spread of cirrhosis of the liver by etiological factors. Oriental renaissance: Innovative, educational, natural and social sciences, 2022;2(6):253-257.
5. Mukhammadieva M.I. (2022). Modern Clinical and Biochemical Characteristics of Liver Cirrhosis Patients of Viral Etiology with Spontaneous Bacterial Peritonitis // Texas Journal of Medical Science. 2022; 86-90 pp.
6. Oblokulov Abdurashid Rakhimovich Mukhammadieva Musharraf Ibrokhimovna Sanokulova Sitora Avazovna Khadieva Dora Isakovna. (2023). Clinical and laboratory features of spontaneous bacterial peritonitis in patients with viral liver cirrhosis. // Journal of Advanced Zoology, 2023;44(S2):3744–3750. Retrieved from http://www.jazindia.com/index.php/jaz/article/view/1716
7. Jalilova Aziza Sadulloevna. (2023). Modern diagnosis and treatment of giardiasis in children. // Best Journal of Innovation in Science, Research and Development, 2023; 533–537 pp. Retrieved from https://www.bjisrd.com/index.php/bjisrd/article/view/1138
8. Jalilova A.S. (2022). Features of clinical manifestations of cytomegalovirus infection in children. // International Journal of Medical Sciences And Clinical Research, 2022;2(9):2-16. https://doi.org/10.37547/ijmscr/Volume02Issue09-04

Entered 20.04.2025