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EPIDEMIOLOGICAL FEATURES OF CYTOMEGALOVIRUS INFECTION

Abstract

The article briefed on the epidemiological features of cytomegalovirus infection and shared the successes and experiences of studying these diseases in recent years. Cytomegaly is an infectious disease of viral origin that is fairly common and its manifestations can range from symptomatic forms of internal organs and the central nervous system to severe injuries. The detection of symptoms of cytomegaly in newborns confirms that the fetus is infected inside the uterus. The presence of cytomegalovirus in the mating of an infected newborn proves that infection occurs through the mating. However, the receipt of cytomegaloviruses from the skin and muscle of the embryo excluded through the surgical procedure, and samples made from the lungs and kidneys of the embryo perpetrated on their own, means that the fetus is infected through ciftia in the womb.

Keywords*: cytomegalovirus, epidemiology, prevention, non-infectious diseases, diagnostics, infectious diseases, epidemiological aspects, epidemiological control*

Introduction

Cytomegalovirus infection – also referred to as cytomegaly, viral disease of saliva glands, occlusion cytomegaly, disease in combination with attachments, SMV “diseases of civilization” - has been widespread around the world over the last decade. Cytomegaly is an infectious disease of viral origin that is fairly common and its manifestations can range from symptomatic forms of internal organs and the central nervous system to severe injuries.

Cytomegaly is a viral disease characterized by damage to the saliva glands and other members, giant cells in their tissues, and large intraocular derivatives. Among the diseases caused by the H erpesviridae family viruses, cytomegalovirus infection is one of the leading places. In most cases, CMV Infectious goes on as symptomatic viruses and occurs only as a clinically manifested disease during primary or secondary immundeficit, indicating that the pathogenesis of the disease plays a leading role in suppressing the immune system function of the infected person (Aghayev, 2022: 414).

Research

The cytomegalovirus infection was first described by Ribbert in 1881 at the end of the nineteenth century under the name “kissing disease”, as it was believed that transmission occurs via a kissing spit. The cytomegalovirus, the real "cause" of cytomegaly, was only discovered in 1956. It has been proven that cytomegaly is not only detected through saliva (although the virus is actually often detected in the saliva glands, so one of the names of the disease – the viral disease of the saliva glands - is derived from it) but also through sexual intercourse, transplacental – it is transmitted from a pregnant woman, as well as during close domestic contact. In addition, cases of cytomegalovirus are known during blood transfusion, and transplantation of organs and tissues. Cytomegaloviurs infection is common, but most virus sufferers do not suspect it at all.

A brief history. Cytomegaloviruses are a special group of the herpes virus family, common among many species of humans and mammals. Its patronymic name refers to the “virus of the saliva glands”' finding of neuter cells (cytomegalic cells) in many cases in the saliva glands of children and animals. Humans used to refer to the disease-causing virus as "the cytomegaly contiguous virus," which indicates the etiological connection of a common disease that often results in death in newborns. For a long time, the diagnosis of human cytomegaly was based on histological examination of the collateral. Carrying out diagnostics in live individuals was possible after the use of a technique to detect the cytomegaly virus in children's urine (Rymarenko, 2023: 47). The cultivation of the cytomegaly virus in laboratory conditions made it possible to develop serological methods of diagnosis by detecting acute disease in patients. The widespread use of virological and serological techniques has made it possible to assess their importance in the diagnosis of congenital and postpartum cytomegaly (Megan, 2022: 138).

Propagation. Cytomegaly virus disease is common in many countries. Immunofluorescence is used in diagnosing of this disease in CIS countries and is currently used in many centers.

Etiology Morphologically, the CMV differs from the human herpes disease and smallpox. The electron microscopy examination results show that the virion consists of an icosahedral capsid (110 nm) connecting 162 capsomeres. Some viral particles are surrounded by a single or double membrane. The size of these particles is 180-250 nm. The electron microscope is located at the nucleus of the virus. The genome of the virus is DNA. Unlike the herpes virus (68%), the cytomegaly virus has significantly less content of guanine and cytosine in its DNA (58%). Virus particles contain lipids. Cytomegaloviruses are dispersed due to repeated freezing and melting and are not stored at -50°C without stabilizers.

These viruses produce reflections that are neutralizing and complementary to their effects. The issue of the presence of various cytomegaloviruses is not yet resolved. A human immune envelope is negative against monkey cytomegalovirus antigen. Cytomegaloviruses develop only in homologous cell cultures. The virus reproduces in human-onset fibroblasts. However, they also develop in receding human cell cultures (embryo skin, lungs, calves, uterine muscle layer, Vi-38 diploid cells). It has a cytopathic effect on viral onset and single cell culture (Congenital Cytomegalovirus, 2017: 64).

Pathogenesis and clinic. The incidence of cytomegaly varies depending on the age. Congestive cytomegaly may cause the fetus to die in utero or produce clinical symptoms specific to cytomegaly. Signs are usually detected after the birth of a child and are symptoms of developmental imbalances, jaundiced hepatosplenomegaly, pneumonia, and most commonly damage to the central nervous system (microcephaly, salt accumulation around the cerebral stomachs, chorioretinitis, atrophy of the visual nerve, sensory and movement delays). Previously, it was believed that congenital cytomegaly necessarily results in the death of a child. It was later discovered that children could contract primary illness and live for several years afterwards. Incidents of mild illness also occur. Children who have survived the disease are usually marked by a diminished brain, mobility disorders, and a delay in mental development. Recently, studies have shown that infection with cytomegaloviruses in the womb has led to the emergence of such conditions in most children with small brains and mentally retarded children. There is also information about developing congenital

disease without notice of clinical signs. It was found that in 8 of 507 born urethra, the virus was detected in urine, but only one was detected with intraocular salt accumulation, and the rest were not different from norlmal children (Sentongo, 2021: 57).

Infection with cytomegaloviruses is possible even after birth, but specific clinical signs are less pronounced at this time. Morphological variations specific to cytomegaly are found in the saliva glands of 8-32% of children who died after 3 years of age, which confirms that children are infected after birth. Some researchers report on breast-feeding of the virus (Davis, 2017: 37).

During the serological examination of the population, the positive result increases exponentially as the age increases. 33-75% of newborns' blood can be found in reflections that combine compliments. Over a year, that number drops to 29%, and in people over 35, it rises to 51-81%. It has been found that children infected with cytomegaloviruses develop chronic hepatitis and interstitial pneumonia. It is especially observed after blood transfusion (during operative intervention in the heart, etc.) for these various purposes.

CMV is common everywhere. Individuals with different geographic locations and economic conditions become infected early in life, and the disease often drives clinically symptomatic. Clinical signs of cytomegalovirus infection usually manifest in the form of primary syndromes: perinatal infection of newborns in mothers with primary SMVI during pregnancy; acute acquired SMVI similar to infectious mononucleosis; and CMVI-syndrome in immunompromised individuals (including HIV-infected people). SMV can be a cause of retinopathies, various gastrointestinal infections, diseases of the central nervous system, and most likely sometypes of atherosclerosis. Oral cavity ulcers in immunocompromised individuals can often be associated with SMV. 53% of ulcers in HIV-positive patients are associated with SMV and 28% with mixed SMV and SHV infection. Sometimes these processes may involve the tissues of the tooth and the parodont, which may lead to future bone destruction and the development of osteomyelitis (Concetta Marsico, 2019: 187).

Depending on the age of the perpetrator in the human body, different forms of virus interaction with the possessed organism are distinguished. If the virus remains in the body for a short time, the infectious process can go either in an acute (short incubation period and development of character symptoms) or inapparent (symptomatic) form.

The main stages of SMVI development are: primary infection of the skin and mucous membranes, «colonization» and acute infection of the bloodbeds, and subsequent development of latency – only viral DNA in the nuclei of neurons proves that infection exists. After completion of the acute phase, SMVI sensation is not more obvious in bruises. The mechanism of progression from the acute stage of infection (at this time, the virus cannot be detected in the homogeneities of bruises) to the latent phase has not yet been clarified. This transition is relevant to the emergence of immune factors: the owner's immune response decreases the reproduction of the virus in the skin, disappears the signal, and the cells of the bloodstream become non-permessive, meaning that the latent stage of infection develops.

Detection of SMVI in the bruises of people who have previously had SMVI confirms the reactivation of the infection, which can be symptomatic and develop with damage to the skin and mucous membranes. Disruption of the balance between cells and SMVI under the influence of prevocational factors leads to accelerated replication of the virus, which clinically manifests as an exacerbation of the disease. SMVI reinfection may occur on several occasions, both with limited (mono-infection) and against the background of other infections (midst-infection) (Agayev, 2022: 416).

Prophylaxis and countermeasures. For the specific prophylaxis of cytomegaly, a live vaccine against cytomegalovirus from the Towne strain was developed as a result of repeated passage in Vi-38 human diploid cells. Vaccination with a live vaccine for 8 weeks before transplanting the kidneys of patients with contraindications to patients without contraindications to cytomegaly virus prevents disease. However, transmission through this tool cannot be prevented. Therefore work in the field of vaccine improvement is developed (D'Antonio, 2023: 137).

General preventive measures should be aimed at the timely detection of patients and viruses and the prevention of the spread of disease by modern methods. These measures should first be taken seriously among pregnant women, and mothers and newborns should be examined in their maternity homes.

Laboratory diagnostics. Laboratory diagnostics of cytomegaly are mainly carried out in two directions: a) acquisition of cytomegalovirus; and b) serological examination.

a) Getting viruses in the urine and saliva (oral cavity) is the most reputable and sensitive way to detect the disease. However, still acquiring the virus does not necessarily mean that it is an etiological factor in the disease (other than newborns with symptoms of cytomegaly). In relatively older children, the etiology of the virus is assumed to be of etiological importance in cases of unknown pneumonia, hemolytic anemia, and hemolytic or chronic hepatitis. This also applies for patients with pneumonia, hepatitis, or cytomegaly who are receiving immunodepressive treatment related to malignant tumors or transfusion of members.

b) Serological diagnostics.

When studying population immunity, it was found to have significant relevance to one another in combining and neutralizing complementarity. In some cases, only neutralizing reflections are found in the patient (Aghayev, 2022: 412).

Conclusion

The human infectious pathology allocates a significant role to SMVI, in which the diversity of clinical signs depends on the localization and distribution of the pathological process and the immune status of the patient (Hughes, 2021: 89). Viral diseases of the mucous membrane of the oral cavity are one of the main places of spread. It has been confirmed that there is a connection between damage to the mucous membrane of the oral cavity, red edging of the lips, skin coverings, genitalia, and SMVI. From the perspective of the interaction between the parasite and the owner, cytomegaloviruses are unusual microorganisms (Gunlemez, 2023: 78). Both intrauterine and lateral viruses (or cytomegaly cells) can be detected in the urine and saliva for a long time, but often high triggers of contraindications to homologous viruses are identified simultaneously. Urine exposure to viruses is noted in children for several months. In the case of this disease, persistent virusemia was identified (they obtain the virus from leukocytes that have not been tampered with) (Shim, 2023: 26). In relatively older children and adults, the virus is excreted with saliva and urine for months. Infection of children after birth was not studied until the end.

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