



PARVOVIRUS B19 AS A CAUSE OF ENCEPHALITIS – A CASE REPORT

ZAKAŻENIE WIRUSEM B19 JAKO PRZYCZYNA ZAPALENIA MÓZGU – OPIS PRZYPADKU

Piotr Czupryna¹, Anna Rogucka^{1*}, Sławomir Pancewicz¹, Karol Borawski¹, Magdalena Róg-Makal², Anna Moniuszko-Malinowska¹

Correspondence to/
Adres do korespondencji:

Anna Moniuszko-Malinowska
14 Żurawia St.
15-540 Białystok, Poland
tel.: +48 85 7409514
fax: +48 85 7409515
e-mail: annamoniuszko@op.pl

¹Department of Infectious Diseases and Neuroinfections, Medical University, Białystok, Poland

²Department of Invasive Cardiology, Medical University, Białystok, Poland

¹*Klinika Chorób Zakaźnych i Neuroinfekcji, Uniwersytet Medyczny w Białymstoku, Polska*

²*Klinika Kardiologii Inwazyjnej, Uniwersytet Medyczny w Białymstoku, Polska*

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*Student of Medical University of Białystok/*Studentka Uniwersytetu Medycznego w Białymstoku*

Abstract

Purpose: Parvovirus B19 is an etiological factor of many disorders, including erythema infectiosum, transient aplastic crisis, pure red cell aplasia, arthritis, non-immune hydrops fetalis and less commonly occurring neurological infections.

Case description: In this paper we present the case of a 36-year old man, in whom encephalitis caused by B19 based on multidisciplinary differential process was diagnosed. The patient was a truck driver. This occupation is associated with the risk of infection through contact with contaminated cargo, difficulties in maintaining personal hygiene, risky sexual contacts, and endemic diseases occurring in different latitudes, which may suggest the infection with other pathogens e.g. HIV, and therefore be highly misleading.

Comment: We conclude that B19 should be always taken into consideration in the differential diagnosis of encephalitis.

Key words: differential diagnosis, encephalitis, B19 virus.

Streszczenie

Cel: Parwovirus B19 jest czynnikiem etiologicznym wielu chorób, m.in.: rumienia zakaźnego, przełomu aplastycznego, wybiórczej aplazji czerwonych krwinek, zapalenia stawów, nieimmunologicznego obrzęku płodu. Rzadziej dochodzi do zajęcia układu nerwowego.

Opis przypadku: W pracy przedstawiono przypadek 36-letniego mężczyzny, u którego w wyniku złożonego procesu diagnostycznego rozpoznano zapalenie mózgu wywołane wirusem B19. Pacjent był kierowcą ciężarówki. Taki zawód wiąże się z ryzykiem zakażenia przez kontakt ze skażonym ładunkiem, trudnościami w utrzymaniu higieny osobistej, ryzykownymi kontaktami seksualnymi i endemicznymi chorobami występującymi w innych szerokościach geograficznych. Wszystko to może sugerować zakażenie innymi patogenami, jak np. HIV, i prowadzić do błędnego wnioskowania.

Komentarz: Zakażenie wirusem B19 powinno być zawsze brane pod uwagę w diagnostyce różnicowej zapalenia mózgu.

Słowa kluczowe: różnicowanie, zapalenie mózgu, wirus B19.

PURPOSE

Parvovirus B19, which was discovered in the 1970's [1], is an etiological factor of many disorders, including ery-

thema infectiosum (EI), transient aplastic crisis, pure red cell aplasia, arthritis, non-immune hydrops fetalis and other less commonly occurring neurological infections [2]. B19-associated infections are widely spread in

the population, yet in most cases they remain asymptomatic or are associated with mild respiratory tract symptoms resembling a cold. B19 is highly infectious. Incubation time ranges from 4 to 14 days, but infection may last as long as 21 days. 136 cases of neurological infections linked with parvovirus B19 have been reported so far [3-5]. The most common neurological manifestation of B19 infection is encephalitis; however, the virus isn't usually included in the diagnostic process. In many cases it was only considered when the cause of encephalitis remains unknown after other pathogens, commonly involved in encephalitis, have been excluded [2]. We present here a case of B19 neurological manifestation. The patient described was a truck driver. This occupation is associated with risk of infection through contact with contaminated cargo, difficulties in maintaining personal hygiene, risky sexual contacts and endemic diseases occurring in different latitudes, which suggests that the presence of other pathogens e.g. human immunodeficiency virus (HIV), and therefore may be highly misleading.

CASE DESCRIPTION

A 36-year old man, who had spent the previous several months in Siberia, began feeling unwell during his return to Poland. His main complaint was general malaise accompanied by speech disturbances, vertigo and dizziness. After 4 days, he was admitted to the Neurology Unit of a provincial hospital. Physical examination revealed bilateral horizontal nystagmus, dysarthria, clumsiness in the finger-to-nose test and positive Romberg's sign. The patient had no history of chronic diseases. Magnetic resonance imaging (MRI) and computed tomography (CT) of the head did not show any abnormalities. Anti-*Borrelia* IgG antibodies, confirmed by Western-blotting, were detected in the patient's serum. Tick-borne encephalitis, syphilis and HIV infection were excluded. Blood cultures were negative. Examination of cerebrospinal fluid (CSF) did not reveal the presence of *Herpes simplex* virus (HSV) DNA. The blood tests showed an inflammatory markers level within the normal range. CSF examination revealed pleocytosis with dominating lymphocytes (64 cells/ μ l) and increased protein concentration (58 mg/dl). The patient was transferred to the Infectious Diseases Unit. Therapy with Ceftriaxone (2 g/d), dexamethasone (18 mg/dl) and mannitol was implemented, yet the patient's condition did not improve during the treatment. A follow-up CT of the head performed after 15 days of hospitalization did not show any abnormalities. The patient was transferred to the Department of Infectious Diseases and Neuroinfections. On admission cerebellar syndrome such as scanning speech, balance disorders and horizontal nystagmus were diagnosed. Treatment with Ceftriaxone was continued, doses

of Dexamethasone and Mannitol were reduced. The patient's condition improved gradually. The follow-up examination of the CSF showed cytositis of 8 cells/ μ l and protein concentration of 45 mg/dl. A gen-probe amplified MTD test of the CSF was negative. Also, no intrathecal synthesis of anti-*Borrelia* antibodies was detected. Examination of the CSF showed the presence of B19 DNA. After 1 month, during a follow-up visit, a significant improvement in the patient's condition was noticed (slight horizontal nystagmus, proper speech, no balance disorders).

COMMENT

Encephalitis is not a frequent disorder in the population, yet it is associated with a high risk of damage to the central nervous system (CNS). Its incidence varies throughout the world and is estimated to be between 0.07 to 12.6 cases per 100 000 people [6]. The diagnostic process usually begins with the search for non-infectious factors and identification of the pathogen. In Western countries, the most commonly identified infectious agents are HSV, and the measles, mumps and rubella viruses. Neurological manifestations of B19 infections are rare, and encephalitis is the most frequent neurological presentation [2, 6]. Encephalitis caused by B19 is difficult to diagnose and its incidence is probably underestimated. Its pathogenesis still remains unclear. There are several mechanisms that could be involved in this process, e.g. direct effect of viral particle, immune complex deposition or cytotoxic properties of NS1 protein. Kerr *et al.* reported that dysregulated immune response may also be responsible for this process [7]. The cases reported so far are heterogeneous. B19 encephalitis has no distinctive features compared to encephalitis caused by other pathogens, except from symptoms appearing in some patients (arthritis, rash and anemia) [2], and it can occur in immunocompetent patients without any typical features of B19 infections [4]; therefore the physician cannot depend on the absence of symptoms associated with B19 infections. Anemia mainly occurs in immunocompromised patients. Arthropathy and rash are more common in immunocompetent patients [4]. Clinical presentation of B19-associated encephalitis includes non-specific symptoms like headache, fever, lymphadenopathy and flu-like symptoms [6]. Diagnosis should be based on the detection of anti-B19 IgM antibodies in serum or the CSF, and the presence of B19 DNA in the CSF proven by means of PCR [2]. Examination of the CSF with the assessment of protein concentration, cell count and neuroimaging studies are not useful in the verification of B19-linked encephalitis, because the results of these investigations vary among cases of patients described in publications and there are no specific abnormalities suggestive of B19 infection [2, 5]. B19 is usually treated

with the intravenous administration of anti-B19 IgM antibodies in order to neutralize the virus, combined with steroids [2]. According to Barah *et al.* 7 of the 129 cases described have been fatal and in 13 the patient developed long term neurological sequelae [8].

In the case of our patient Parvovirus B19 was a causative agent of encephalitis. Diagnosis was based on PCR. The patient didn't have any clinical features of typical B19 infection. Analysis of the CSF revealed pleocytosis and elevated protein concentration. Neuro-

imaging studies found no abnormalities. The patient's condition improved, yet the infection caused sequelae in the form of slight horizontal nystagmus. In the case presented, the search for an etiological factor lasted one month. Suggestive information obtained during history taking turned out to be misleading and made diagnosis difficult to establish, which led to postponed treatment introduction, showing that parvovirus B19 should be included in the differential diagnosis of encephalitis.

Conflict of interest/Konflikt interesu

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