CASE REPORT

# Molecular Detection of Human Parvovirus B19 (B19V) in an HIV-Infected Patient without AIDS, in Manaus, Amazonas, Brazil

# Detecção Molecular do Parvovírus Humano B19 (B19V) em um Paciente Infectado pelo HIV sem AIDS, em Manaus, Amazonas, Brasil

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## Abstract

Human Parvovirus B19 (B19V) infection in asymptomatic Human Immunodeficiency Virus (HIV) patients often presents as an exanthematous illness with joint pain, potentially leading to the misdiagnosis as dengue or other diseases. This study presents a case of B19V/HIV co-infection in a patient initially suspected of having dengue who was undergoing treatment at a reference hospital in Manaus, Amazonas. The sample was tested for HIV and dengue virus and then stored at -80°C. HIV-positive and dengue-negative, with B19V DNA recently detected. B19V should be included in the differential diagnosis, especially in regions prone to infectious agents that present similar clinical manifestations.

**Keywords:** parvovirus B19; HIV; Amazonas.

## Resumo

A infecção pelo Parvovírus B19 (B19V) em pacientes assintomáticos com Vírus da Imunodeficiência Humana (HIV) frequentemente se manifesta como uma doença exantemática com dor nas articulações, o que pode levar ao diagnóstico incorreto de dengue ou outras doenças. Este estudo apresenta um caso de co-infecção B19V/HIV em um paciente inicialmente suspeito de dengue que estava em tratamento em um hospital de referência em Manaus, Amazonas. A amostra foi testada para HIV e vírus da dengue e, em seguida, armazenada a -80°C. O resultado foi positivo para HIV e negativo para dengue, com DNA de B19V recentemente detectado. O B19V deve ser incluído no diagnóstico diferencial, especialmente em regiões propensas a agentes infecciosos que apresentam manifestações clínicas semelhantes.

**Palavras-chave:** parvovírus B19; HIV; Amazonas.

## INTRODUCTION

Human Parvovirus B19 (B19V) is a member of the Parvoviridae family that predominantly infects erythroid progenitor cells and is commonly transmitted through respiratory secretions[1]. B19V infection can lead to a wide range of clinical conditions, from benign, self-limiting, and exanthematous illnesses resembling other viral diseases and even fetal death[1]. Immunocompromised patients, such as those undergoing chemotherapy or individuals infected with Human Immunodeficiency Virus (HIV). In this population, B19V infection is a cause of severe anemia, and its relationship with HIV has been documented since the late 1980s when B19V was considered the cause of anemia in HIV-infected patients[2]. Naides et al. (1993)[3] examined the serum of HIV patients using PCR, and B19V-positive samples presented with severe anemia. The authors concluded that the B19V infection could be a cause of anemia in patients with HIV/Acquired Immune Deficiency Syndrome (AIDS). In another report, approximately 25% of severe chronic anemia cases in HIV/AIDS patients were attributed to B19V[4]. Further studies corroborated that B19V infection is the cause of chronic anemia (red cell aplasia) due to continuous uncontrolled viral replication, thus resulting in erythroblast destruction[5].

The first evidence of B19V in Brazil occurred in Rio de Janeiro in 1983, and antibodies in blood donors were detected by counterimmunoelectrophoresis[6]. Consequently, several studies have attempted to clarify the different clinical expressions in Brazil and their association with HIV[7]. In the northern region, the first finding of B19V with the detection of IgM antibodies occurred in 1987 in Belém (Pará), and similar findings were reported in subsequent years[8,9].

In the Amazon region, the first study to evaluate specific antibodies for B19V (IgM) predominantly included pediatric patients with a negative diagnosis of dengue[9]. Subsequently, it was possible to detect B19V DNA in samples that tested negative for dengue virus (DENV) collected during different dengue epidemic periods in the Amazon[10]. However, no description of B19V in HIV-infected patients was found in the Cochrane Library, LILACS, SciELO, MEDLINE, PubMed, or PubMed Central (PMC) databases. Nevertheless, the diagnosis of B19V is important for the proper treatment of chronic anemia, which may also be caused by other factors, thus justifying the publication of this report. The aim of this study is to present a case of B19V and

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HIV coinfection in a patient initially suspected of having dengue fever, undergoing treatment at the Fundação de Medicina Tropical Doutor Heitor Vieira Dourado (FMT-HVD) in Manaus, Amazonas, Brazil.

## CASE REPORT

In 2011, a 49-year-old man residing in the south-central zone of Manaus (identified as AM201101) presented on June 8, 2011, reporting one day of fever, headache, myalgia, arthralgia, rash, and vomiting. Initial tests for *Plasmodium* and molecular testing (RT-PCR) for DENV were requested, yielding negative results. On June 10, the patient developed diffuse erythema with intense pruritus. At this point, syphilis serology was requested as the patient reported undergoing alternative treatment for syphilis because of an allergy to conventional syphilis medications. Seven days later, the symptoms persisted, leading to a diagnostic consideration of syphilis reactivation. On July 5, a rapid HIV test returned positive results, which were later confirmed using serological and viral load tests. The serum sample collected for DENV detection was stored at -80°C.

Recently, a retrospective study on the molecular detection of B19V DNA was conducted using samples from patients treated at the FMT-HVD, a reference hospital for infectious diseases in Manaus, AM, between 1998 and 2011. This study included patients with negative results for malaria and DENV and was approved by the FMT-HVD ethics committee (registration number 0004.0.114.000-05). Serum samples from patients presenting at least three of the following symptoms fever, headache, retro-orbital pain, myalgia, arthralgia, prostration, and rash—were collected during the acute phase (0-6 days), selected, and stored at -80°C. Viral DNA was extracted from serum samples using the QIAamp Viral DNA Mini Kit (Qiagen, Hilden, Germany), followed by nested PCR for B19V DNA detection using primers that amplify the genomic region encoding the structural proteins VP1 and VP2[11]. The products generated in the second round of amplification were analyzed by 1.5% agarose gel electrophoresis with ethidium bromide and visualized under ultraviolet light. B19V DNA was detected in sample AM201101, which was obtained from an adult male HIV-positive patient.

## DISCUSSION

The case presented in this study aligns with the existing literature that describes B19V infection in asymptomatic HIV patients as an exanthematous illness accompanied by joint pain similar to that observed in immunocompetent individuals[7]. Furthermore, the symptoms of B19V infection can easily be mistaken for dengue and other viral infections that present with exanthematous manifestations[7,9,10,12]. Additionally, erythroid suppression caused by B19V may contribute to the initial clinical manifestations of HIV infection, as reported by other authors[7]. In this case, it is possible that B19V coinfection triggered the early symptoms of HIV infection, especially considering that the initial clinical presentations of HIV can resemble those caused by other etiologic agents. This clinical similarity is one reason why tests for malaria and dengue, which are endemic to the Amazonas region and share similar early symptoms, were initially performed [9,10].

It is the first report of B19V and HIV co-infection in Manaus, Amazonas. Literature indicates that B19V infection may lead to atypical conditions in immunocompromised patients[12]. However, in the present study, the patient did not develop atypical infections and continued to receive treatment at FMT-HVD. This case also underscores the underreporting of B19V infections owing to the similarity of its symptoms to those of other infectious diseases[10], which can lead to misdiagnosis and inadequate clinical management. Vigilance and inclusion of B19V in the differential diagnosis of exanthematous infections are essential to avoid such errors. Differential diagnosis in endemic regions, such as Amazonas, can clarify the true clinical status, especially in adult patients, thereby contributing to the surveillance and control of diseases such as AIDS. B19V should be included in laboratory investigations, particularly in endemic areas where multiple infectious agents with similar clinical manifestations circulate concurrently.

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