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Human Monkeypox with Positive VZV Antibodies in An Immunocompetent Heterosexual Male During a Travel in Rio De Janeiro- Brazil: A Coinfection Case Report

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Abstract

Monkeypox is an infectious disease that gained worldwide prominence due to its occurrence in non-endemic countries and its transmissibility among humans. Here, we describe a case of a 31-year-old heterosexual Brazilian male who had no previous contact with any suspected or confirmed case of monkeypox, did not present fever and lesions in genital area, HIV negative, positive for monkeypox virus (hMPXV) trough real-time polymerase chain reaction, and positive serologic results for varicella zoster, even though had no history of the disease and recent vaccination. It was observed that despite the healing of lesions there was an increase in varicella zoster virus (VZV) antibodies. Patient also presented positive serology for herpes simplex virus (HSV) type 2. However cross-contamination is more frequent between VZV and HSV type 1. This case report highlights the importance of more molecular and serological studies on hMPXV and VZV to identify characteristics that may influence the differential diagnosis, clinical outcome and disease management.

Keywords: Monkeypox Infection; Inflammatory Disease; Smallpox; Chickenpox; Serologys

Introduction

A 31-year-old Brazilian male patient, living in Rio de Janeiro, married, heterosexual, and a navy worker, sought a teleconsultation complaining of non-pruriginous lesions on the face and on anterior and posterior thorax in larger extent and in less amount on the lower and upper limbs on August 2nd, 2022. Symptoms had started on July 31st, and a wound secretion swab was collected on the next day. Patient was isolated in a hotel in Rio de Janeiro for 21 days. Patient denied having had fever. However, he said that felt pain in the right and left cervical regions for two days before the appearance of the skin lesions. He reported having had sexual intercourse with her 5-year partner in a hotel/motel one week to two days before the onset of lesions. Fifteen days before the appearance of skin lesions he had a regular work life on land before going on the ship, without contact with sick people or with similar skin lesions. Her partner has not developed any symptoms. Moreover, patient denied recent vaccination for varicella (chickenpox)/herpes zoster (last 12 months), and did not have those infections either as a child or during his adult life.

At physical evaluation, the patient was clinically stable without any systemic symptoms, except for the non-pruriginous morbilliform lesions without any bacterial infection sign (Figure 1), pain in the lesions in any region of the body, as well as absence of lesion in the genital and anal area. At the 8th day of symptoms, patient observed the appearance of the skin lesions on his feet, but in smaller numbers (Figure 2). Furthermore, a retro auricular pain passed 4 days after the onset of the symptoms. Crusts started to be more frequent from day 11 of symptoms and started to fall at day 16. Patient has authorized the use of his photos for case discussion

through a written authorization as well as his laboratory test results. Patient did not mention fever, which is the most common symptom described, followed by adenomegaly and muscle and head pain or lesions in genital area, which was the most common site of its appearance, followed by trunk skin lesions, that were more common in the patient [1,2]. Herein, our patient presented retro auricular pain probably due to lymphadenopathy. During his isolation, on August 8th, monkeypox infection was confirmed through real-time polymerase chain reaction (RT-PCR), with cycle of quantification of 16,95 (Table 1). At the diagnosis, C-reactive protein was elevated, indicating an acute phase inflammatory disease. Patient also tested negative for syphilis and HIV infection, with normal values for CD4+/CD8+ ratio. Regarding to varicella zoster (VZV) antibodies, patient presented positive results for IgM and IgG with an increase in IgG concentration in a week, however patient denies having smallpox, chickenpox or herpes zoster during his childhood or adult life as well as recent vaccination. According to the laboratory, patient had previous positive serology for herpes simplex virus type 2 (HSV-2).

Table 1: Laboratory tests results.

Patient's values			
Laboratory test	**4/8/2022**	**11/8/2022**	**Reference range**
RT-PCR Monkeypox virus	16,95 (CT)		Non detected
Erythrocytes (106 /µL)	4,97	5,09	4,5 - 5,5
Hemoglobin (g/dL)	14,6	15,0	13,0 - 17,0
Hematocrit (%)	44,3	45,8	40,0 - 50,0
Mean Corpuscular Volume (MCV) (fL)	89,1	90,0	83,0 - 101,0
Mean Corpuscular Hemoglobin (MCH) (pg)	29,3	29,5	27,0 - 32,0
Mean Corpuscular Hemoglobin Concentration (MCHC) (g/dL)	32,9	32,8	31,0 - 36,0
Red Cell Distribution Width (RDW) (%)	12,5	12,3	11,6 - 14,0
Leukocytes (% / µL)	100 / 4800	100 / 4960	100 / 4000 - 10000
Young neutrophils (% /µL)	12 / 576		
Segmented neutrophils (% / µL)	71 / 3408	62,5 / 3100	40 - 80 / 1800 - 7800
Eosinophils (% / µL)	1,0 / 48	2,2 / 109	1,0 - 6,0 / 20 - 500
Basophils (% / µL)	0 / 0	0,3 / 15	0,0 - 2,0 / 20 - 100
Lymphocytes (% / µL)	11 / 528	28,7 / 1424	20 - 40 / 1000 - 3000
Monocytes (% / µL)	5 / 240	6,3 / 312	2 - 10 / 200 - 1000
Platelets (µL)	121000	253000	150000 - 450000
CD4+/CD8+ Ratio	---	1,0	0,8 - 3,5
T CD8% Lymphocytes (%)	---	37,30%	13,8 - 27,4
Absolut CD8 (/µL)	---	610	212 - 725
T CD4% Lymphocyte (%)	---	36,2	30,7 - 49
Absolute CD4 (/µL)	---	593,0	478 - 1141
C-Reactive Protein (mg/dL)	3,7	0,17	≥ 1 - acute phase inflammatory disease
Syphilis FTA-ABS IgG	Non-reactive	---	Non-reactive
Syphilis FTA-ABS IgM	Non-reactive	---	Non-reactive
Syphilis VDRL	Non-reactive	Non-reactive	Non-reactive
Varicella zoster - IgG (mUI/mL)	377	771	Non-reactive: < 150; Reactive: ≥ 150
Varicella zoster - IgM (mUI/mL)	> 2,3	> 2,3	Non-reactive: < 1; Reactive: ≥ 1
Anti HIV 1/2 - Antibodies	---	0,07 -Non-reactive	< 1,00 - Non-reactive; Undetermined: 1,00 – 5,00; Reactive: > 5,00

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HBsAg - Hepatitis B	---	Non-reactive	Non-reactive
anti-HBs (mUI/mL)	---	708,8	Non-reactive: < 1; Reactive: ≥ 1
anti-HCV	---	Non-reactive	< 1,00 - Non-reactive
Cytomegalovirus IgM	---	Non-reactive	Non-reactive
Herpes simplex type 2 - IgM	---	1,8	Non-reactive: < 0,8; Undetermined: 0,8 – 1,0; Reactive: ≥ 1,1
Herpes simplex type 2 - IgG	---	1,7	Non-reactive: < 0,8; Undetermined: 0,8 – 1,0; Reactive: ≥ 1,1

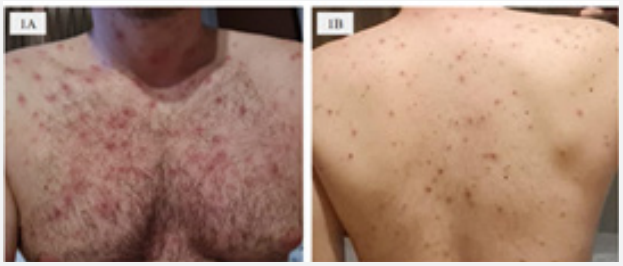

Figure 1: Skin lesions presented by the patient identified during physical evaluation by teleconsultation. Figure 1A: lesions in anterior thorax; Figure 1B: lesions in the back.

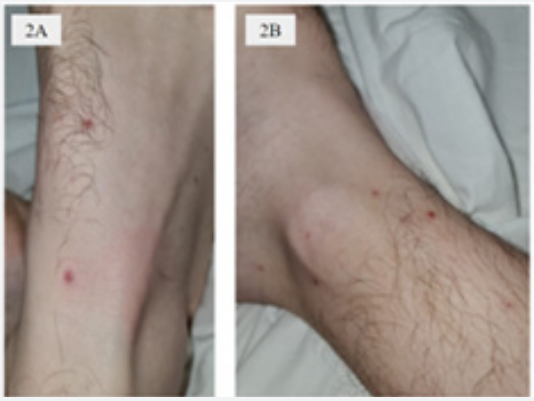

Figure 2: Skin lesions at patient's' feet on the 8th day of symptoms.

It is interest to notice that HSV, especially type 1, may share some similarities with VZV, which can cause a cross reaction, leading to a misdiagnosis [3-6]. However, patient presented a positive serology for HSV-2, that is characterized by lesions in the genital area [4-6], which has not been observed in the present case. Costa-Silva et al. reported a concurrent reactivation of VZV and HSV in a male without history of herpes simplex, but with specific-IgG positive for both viruses as serologic evidence of past infection [4]. Also, co-infection cases of monkeypox and VZV in Democratic Republic of Congo were reported and it was suggested that the infection with those two virus might modulate the severity of monkeypox [7-9]. It is noteworthy that in those cases the diagnosis of monkeypox, VZV and co-infection were corroborated with genomic analysis, and it is not representative of the current outbreak. In the present report, monkeypox infection was confirmed by RT-PCR and there was no molecular analysis for VZV or HSV making not possible to claim that this is a case of co-infection or if it represents a cross reaction, since there is no information up to date about genetic similarities and if there is any kind of interference on serologic exams. This case report enhances the importance of more studies about monkeypox and VZV, their serological similarities as well as differential diagnosis through molecular methods.

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