

The Italian Case of a Young Woman with Monkey pox

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1. Abstract

We described the case of a young woman with Monkeypox. After focusing on the characteristics of the Monkeypox virus, we described our case report. The diagnosis of Monkeypox in our patient was delayed because she did not have all the clinical manifestations typical of the disease. In fact, she did not present genital and oral lesions. Furthermore, the patient’s clinical course was linear. Unlike various cases described, she had no bacterial superinfections or other complications. The lesions were resolved without treatment and after 15 days of hospitalization the patient was discharged home, after performing a lesion swab that was negative for MPXV. Finally, we tried to understand through the analysis and comparison of studies in the literature as some patients present certain manifestations rather than others. So it is important immediately identify patients with this virus, avoiding the spread of the infection.

2. Introduction

Monkeypox (MPXV) is a zoonotic infection, caused by a Poxviridae family virus, chordopoxvirinae subfamily and Orthopoxvirus genus [1]. The virus consists of double-stranded DNA surrounded by a lipoprotein envelope and is about 200 nanometers on the electron microscope. MPXV has been found in various species and it is not clear which of them serves as the main animal reservoir. Probably wild small rodents [2]. The first case in humans was diagnosed in 1970 in a child in Congo. Since then, MPXV is endemic in Central and West Africa, particularly in the Democratic Republic of the Congo [3]. The first case, outside Africa, was reported in 2003 [4]. Over the years other sporadic cases have occurred outside Africa as in 2018 and 2019 when two subjects had traveled to Nigeria. But the increase in cases in the first months of 2022 even in non-endemic regions has aroused the interest of scientists [5].

There are a total of 75345 confirmed cases, including 32 deaths, in about 109 countries around the world (latest report by WHO) [6]. MPXV is an Orthopoxvirus that is genetically distinct from other members of the Poxviridae family, including the variola, vaccinia, ectromelia, camelpox, and cowpox viruses. It was first identified as the cause of a pox-like illness in captive monkeys at the Copenhagen Serum State Institute in 1958. But infections have also been identified in other animals such as mice, squirrels and rats. Monkeypox is considered to be the most important Orthopoxvirus infection in human after the eradication of smallpox. In contrast to variola virus, however, MPXV has a wide range of hosts, which allowed it to maintain a reservoir in wild animals, sporadically causing human disease, and precluding global eradication with human vaccination [1-2]. The mode of transmission to humans is from infected animals, and transmission from man to man occurs through body fluids, salivary droplets (rarer), or contact with wounds. The risk factors of MPXV are: not being vaccinated against smallpox; handling the meat of contaminated wild animals; living in rural areas of Central and Western Africa; close contact with affected individuals [7-8].

This epidemic is characterized by unique epidemiological characteristics and varies from the previous ones in terms of gender, age and mode of transmission. In fact, it almost exclusively affects males (97%) aged between 18 and 50, mainly in MSM (men who have sex with men), transmitted from one person to another by sex, close contact with lesions, respiratory droplets, body fluids and contaminated materials [9]. However, it is difficult to understand the incidence of the disease considering that not all cases are reported. From a pathophysiological point of view, after the virus enters the body, it replicates at the injection site, reaches the nearest lymph nodes and then spreads to the other lymph node stations.

This incubation period is 7-14 days. Then there is a second stage in which the patient may experience prodromal symptoms such as fever and fatigue followed by the appearance of lesions. The diagnosis is clinical and confirmed by laboratory PCR (Polymerase Chain Reaction). There are also alternative tests to diagnose MPXV. For example, serum studies for anti-Orthopox virus IgM and IgG and immunohistochemical staining for Orthopoxvirus antigens [10-11].

The diagnostic suspicion of MPXV must arise in those subjects who have the risk factors listed above in the text, who have a positive history of promiscuous and unprotected sex and who have certain clinical characteristics. Clinically the disease is characterized by fever, fatigue, headache and lymphadenopathy. After a couple of days from these symptoms, lesions appear in the mouth, on the face, then palms of the hands and soles of the feet. Lesions can spread further and can be few or many. In the following weeks the lesions go through various synchronous stages of evolution: macular, papular, vesicular and pustular. Then they become scabs. The diameter of the lesions varies on average around 5 mm up to a maximum of 10. From the therapeutic point of view there are no specific medications for MPXV but the therapies consist only in support or antibiotics if there are bacterial superinfections. However, there are preventive measures that must be taken to prevent the spread of the disease. These include air and contact isolation until all crusted lesions have fallen off. The mortality rate of human MPXV is estimated at 8.7% with a higher mortality rate in Central Africa. The central African clade is more lethal than the Western one. But in most cases patients have a good prognosis, they heal with some scars remaining at the lesions [3]. The interesting case we present is that of a 31-year-old Italian woman who was diagnosed with MPXV at the beginning of August 2022 at the Clinic of Infectious Diseases in Chieti, Italy and who had different clinical manifestations than most patients who have this disease.

3. Case Report

We report the case of a 31-year-old young woman who arrived at the beginning of August 2022 at the emergency room (ER) of the Santissima Annunziata hospital in Chieti, Italy for the appearance of itchy lesions for about 10 days. Three days before, she had gone to the dermatology of another city in Abruzzo for skin lesions. But the diagnosis was not made and the suspicion of MPXV was not raised. The patient was sent back to home. Upon arrival in the ER, she showed with low-grade fever (tp max 37.5 C), cervical lymphadenopathy and skin lesions. She had not taken any therapy except bisoprolol and methadone 40 mg. In fact, she had a history of active drug addiction with inhaled cocaine and intravenous

heroin and arterial hypertension under pharmacological treatment. She also had a history of eating disorders (anorexia and bulimia). In the ER, she underwent blood and radiological tests and an examination of infectious diseases. She did not report travels in the last 3 months and reported unprotected heterosexual sex. Transmission was suspected to have occurred through sexual activity. In fact, based on the evidence reported, the probability that MPXV spreads in networks of people who have multiple sexual partners is considered high. The presence of skin lesions gave rise to the strong suspicion of MPXV confirmed by polymerase chain reaction (PCR) on swab of the lesions, obtained the day after collection. In fact, confirmation of MPXV infection was based on nucleic acid amplification testing (NAAT), using real-time PCR, for detection of unique sequences of viral DNA.

Other possible diagnostic hypotheses were formulated prior to confirmation of MPXV. For example, secondary syphilis, impetigo and molluscum contagiosum. The patient was at risk for sexually transmitted diseases. She was also a social case because she lived alone and her minor daughter was not entrusted to her. The patient was immediately placed in air and contact isolation in a negative pressure room, was admitted to the Infectious Diseases Clinic of Chieti and hospitalized for a total of 15 days. On admission day 1, She appeared alert, oriented and cooperative, without neurological alterations. On laboratory tests she presented microcytic anemia (Hgb 9.9 g/dL), increased C Reactive Protein (CRP) and neutropenia with normal count white blood cells (WBC). The other blood values were normal included the count of lymphocyte subpopulations. Tests for other viruses were performed (negative HBV and HIV markers; positive anti-HCV antibodies with negative viremia). Chest X-ray showed no signs of pulmonary congestion or effusion.

About 22 crusted skin lesions with some ulcerated lesions were located on the back of the hands bilaterally, lower limbs, abdomen, legs and forearms (shown Figures 1-3). The lesions were not present on the genitals, neither palms of the hands, nor soles of the feet. Lesions not even present in the face and mouth. The evolution of the lesions was synchronous. In fact, they were at the same stage at the same time. They were ulcerated lesions (5 mm of diameter) with a depression in the center (umbilication). Over the next 5 - 7 days, lesions evolved into crusts and finally, before demission, partially removed scab. The patient had no complications during the hospital stay. She had no bacterial superinfection of the lesions; therefore, no antibiotic therapy was necessary. At discharge on day 15 blood tests showed resolution of anemia present at admission, normalization of neutrophils and negative CRP.



Figure 1: Skin lesions of the patient's left hand on admission day 1.



Figure 2: Skin lesions on right forearm.



Figure 3: Ulcerated lesions on the legs, 5 mm diameter.

4. Discussion

MPXV is a public health problem since the beginning of 2022. The spread of this virus has attracted the interest of the whole scientific world because it is no longer limited exclusively to certain areas. In fact, if in the past there were isolated cases only in some areas of the world, today the MPXV has also reached our nation. As we have seen, the transmission of the virus can occur in various ways (by sexual contact, by contact with the lesions). Some mechanisms of action of the virus have yet to be clarified. In fact, there is no available therapy that can stem the problem in the bud. Patients often need to be hospitalized for complications from lesions rather than the virus itself. Often these lesions can undergo bacterial infections that require hospital care. In most cases, patients have lesions of the oral or genital mucosa and these areas can present a greater risk of complications.

The increase of cases in areas where they had not been reported until now is also due to the interruption of vaccination against smallpox. A large portion of the population is therefore no longer protected and can have the disease. For example, in Italy, about 760 cases are registered. Among these 749 are men, only 11 cases are women. The average age of this patients is 35 years and most had sex with men (MSM). Women are therefore less affected than men [12].

Despite this, in our clinical case there is the description of MPXV in a young woman and as seen in the description section of the case report, the clinical manifestations of our patient were dif-

ferent from those normally seen and described in the literature. Abnormalities were also found on the mode of transmission, but this is due to the fact that the patient did not report contact with people potentially affected by MPXV. Clinically, she experienced fever and lymphadenopathy before the onset of the rashes. She had itching but no pain at the lesions that later evolved into scabs. The latter affected a large part of the body with the exception of the mouth, anorectal area and genitals. We know from numerous studies that localization in these areas is very frequent.1 But the patient despite having numerous lesions all in the same evolutionary phase has never had lesions in genitals or mouth areas. In fact, although she came to our observation when the lesions were in an advanced stage of the infection, there were no alterations at the genital and oral level. She herself denied the appearance of injuries in these parts of the body before she reached the hospital.

Nevertheless, as reported by various authors, the infection is often characterized by the genital lesions which represent the first manifestation of the disease [13-14]. In a study involving 16 countries on 528 patients (98% men) it was found that 73% had anogenital lesions and 41% mucosal lesions [6]. Genital lesions are often the first to appear and are also found in the later stages until healing [15]. The different manifestations of lesions could be due to various factors that should be investigated in future studies. It would be interesting to understand what determines the localization of lesions in certain parts of the body rather than in others and if the clinical manifestations are different between males and females. It is also true that from an epidemiological point of view, males are more affected than women [16]. A difference in clinical manifestations between males and females could be hypothesized [17]. But to state, this it is still too early because women are much less affected than men and therefore there are not enough numbers to make certain claims. However, it is an interesting field that could be investigated in the future. Clarifying these points is also essential to make a diagnosis as soon as possible. For example, in our patient, the different clinical presentation could have affected an early diagnosis. In fact, the patient is not immediately placed in isolation. Delaying the diagnosis can be dangerous because the patient unknowingly can continue to perpetuate certain behaviors or to live normally life by spreading the disease. And that is exactly what happened to our patient. Before going to our hospital she was examined by other doctors who did not recognize or hypothesize the diagnosis, sending the patient back to her home which continued her activities until the day she arrived to our observation. This means that updating campaigns on this new virus should be carried out so that even patients who do not have standard clinical manifestations are diagnosed [18]. The course of MPXV disease is in most cases regular. Patients in a few cases require hospitalization and in as many rare cases they go to death [19]. Our patient was hospitalized more for a social issue than for the disease itself. In fact, the tests did not show significant alterations and she was kept in isolation and under observation. The skin lesions were resolved

and did not require antibiotic therapy as she never had clinical and laboratory signs of bacterial infection. It can be hypothesize that the infections mainly affect those patients who have genital lesions and oral and anal mucous membranes or those patients whose skin lesions are particularly extensive [20]. Our patient did not show any genital or oral lesions. The lesions were numerous and over a large part of the body. But despite this, the patient had no complications. In fact, the lesions did not cause bacterial superinfection.

Therefore, understanding the different clinical manifestations and the underlying causes of the differences between the various subjects could guarantee an early diagnosis, an immediate isolation of patients and a reduced spread of the infection. A comprehensive response is necessary. Countries should work to ensure a reduction in the spread of the virus. They should increase the diagnostic methods, implement specific measures to keep patients who do not need hospitalization even at home in isolation by implementing what we have learned from COVID-19 [21].

5. Conclusion

MPXV is spreaded around the world since the first months of this year. Many studies have investigated the mode of transmission, clinical manifestations and prognosis. Some mechanisms are not yet known as well as the therapies. Clinically MPXV can also present in a different way from what is normally described in the literature as in the case of our patient. The clinical case described is that of this young woman whose clinical manifestations were different from what is normally seen in patients with MPXV. Despite this, the patient's clinical course was linear. Unlike various cases described, she does not experience bacterial superinfections or other complications. The lesions resolve themselves and after 15 days of hospitalization the patient is discharged to her home, after performing a lesion swab that is negative for MPXV. The case of this young woman makes it clear that the clinical manifestations of MPXV are not always the same and that this can lead to a delay in the diagnosis. Understanding the various clinical manifestations and modes of transmission is essential for diagnosing and isolating cases in order to prevent the spread of this virus which in some cases, although rare, can even be fatal. The disease may not always present the same way. It is therefore necessary to carry out an accurate medical history of the patient, to understand if there are any risk factors and to suspect the patient's clinic. The lesions can present in different stages of evolution and this, together with the different location, could mislead the diagnosis. Finally, further studies could therefore investigate the underlying causes of the various manifestations of the disease to identify therapeutic strategies that can stem the problem of this new disease.

6. Patents

6.1. Author Contributions

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6.3. Institutional Review Board Statement

The study was conducted in accordance with the Declaration of Helsinki, and approved by the Institutional Review Board of G. d'Annunzio University Chieti- Pescara, Italy.

6.4. Informed Consent Statement

Written informed consent has been obtained from the patient to publish this paper.

6.5. Data Availability Statement

Not applicable.

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6.7. Conflicts of Interest

The authors declare no conflict of interest.

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