CASE REPORT

VULVAR INFECTION AND POSSIBLE HUMAN-TO-HUMAN TRANSMISSION OF BOVINE POXVIRUS DISEASE

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ABSTRACT

In a dairy cattle farm, father and son developed successively a vesicopustular infection, with lesions in the hands and wrists, after contact with cows with vesicular lesions on the udder. After sexual contact with her husband, the mother showed a severe vesicular vulvar infection, which healed in about three weeks, leaving no scars. All family members showed high levels of antibodies in a plaque reduction neutralization test, using as antigen a locally isolated poxvirus strain, identified as a vaccinia-like virus by sequencing techniques. These data reconfirm that vaccinia-like viruses are circulating in Brazil and that person-to-person transmission may occur, without any relation to vaccinations against smallpox.

INTRODUCTION

The Poxviridae virus family includes an ancient group of viruses, which infects humans, vertebrate and insects. In vertebrates, these viruses cause, mainly, vesicular/pustular infections of different degrees of severity (Schatzmayr & Costa 2005). Some of the human pathogenic poxvirus infections are zoonoses.

Orthopoxvirus is the most important genus in relation to human infections, including the smallpox virus, eradicated as a human disease in 1977 and the vaccinia virus, with different strains that were used in vaccines to prevent smallpox.

Orthopoxvirus infections after the discontinuation of the vaccination against smallpox have been observed in the state of Rio de Janeiro (Damaso et al. 2000, Schatzmayr et al. 2000), in dairy cattle and in humans in close contact with them. Over the
years, poxvirus strains isolated in the state were characterized as vaccine-like viruses similar to the vaccinia-IOC strain, which was used in the past for vaccine preparation (Damaso et al. 2000). Other orthopoxvirus strains isolated in the southeastern region of the country (De Souza et al. 2003, Nagasse-Sugahara et al. 2004, Lobato et al. 2005) were confirmed as vaccinia-like poxviruses.

The orthopoxviruses exhibit a tropism for epithelial cells and, in general, have the tendency to produce cutaneous lesions. In most cases, the lesions are characterized by progressive stages of macules, papules and vesicles. The initial opalescent vesicular fluid becomes opaque, turbid and finally turns into a pustule. The absorption of the fluid promotes the formation of a scab and the healing of the lesion. Among the members of the orthopoxviruses, the most deadly virus for humans is variola major, the agent of smallpox, but this virus now is only known to exist in two World Health Organization (WHO) approved repositories, at the Centers for Disease Control and Prevention (CDC), Atlanta, USA, and at the Vector Laboratory, Novosibirsk, Russia.

This article describes female genital infection and most probably a human-to-human transmission of a bovine poxvirus disease.

A family of three were infected by poxvirus: the husband (BDV, 47 years), wife (AJV, 40 years) and son (BLJV, 17 years), who work on a farm, milking cows by unprotected hand in Paraíba valley (Brazil). On 11 October 2008, BDV began with symptoms of macula, papule and pustules on his hands and wrists. He received the usual treatment with symptomatic medicine.

In order to not reduce milk production, his son helped him and showed the same lesions after one week (18 Oct 2008) and his wife had vulvar pustules two weeks after the
beginning of her husband’s disease (25 Oct 2008). The couple had sexual relations after the husband’s hands lesions were evident.

AJV went to the Gynecology and Obstetrics Emergency Health Service of the University Hospital of Taubaté during the pustular stage (25 Oct 2008). Antibiotics were given for secondary infection and analgesics. She had gentian violet (1% solution in water) treatment for the vulvar pustules (Figure 1).

Figure 1. Vulvar lesions of poxvirus.

AJV was sent for an appointment in the Vulvar Pathology Ambulatory Clinic and on genital examination exhibited hyperemia, edema, many ulcers in the entire vulvar area and bilateral inguinal adenopathy. The swollen area was acutely sore when touched. There were no signs of secondary infection at that time. Vaginal examination was not possible because of her aching and a synechia in the middle of labia minor. Vagitrene (R) vaginal cream (*Triticum vulgare* aquosum extractum) was prescribed for topical use, which has a cicatrizing effect on vulvar lesions. She returned in December (23 Dec 2008) fully
recovered, with no scars observed. Serologies was negative for sexually transmitted
diseases, including AIDS, syphilis and hepatitis B.

In January 2009, blood samples of the family were collected and sent to the
Laboratory of Morphology and Viral Morphogenesis, Instituto Oswaldo Cruz. All sera
were positive, with high levels of orthopoxvirus antibodies. For the serology a plaque
reduction neutralization test has been applied to the sera, using as antigen the
Orthopoxvirus strain Cantagalo/IOC, as already described (Costa et al. 2007).

**DISCUSSION**

Infection caused by orthopoxviruses in humans and animals have been described in
the state of Rio de Janeiro in the past (Silva & Moraes 1961, Mesquita & Schatzmayr
1969). Smallpox vaccination in Brazil during the smallpox eradication campaign was
carried out in the rural areas on a farm-by-farm system and careless handling of flasks
containing the smallpox live vaccine, with high virus titers, was usual. These procedures
most probably allowed the dissemination of the vaccinia virus in nature, probably with
more than one introduction. Smallpox vaccination was discontinued in the country in the
1970s, but several studies confirm that vaccinia-like viruses are circulating in nature,
sustaining and generating new human and animal infections (Silva et al. 2008). A recent
review emphasized the capacity of orthopoxviruses to adapt themselves to new animal
species and also confirm the presence of vaccinia-like cases in Brazil, characterizing a
zoonosis in expansion (Regnery 2007).
Vulvar infections caused by vaccinia virus transmitted from vaccinees to family members (Humphrey 1963, McLaughlin et al. 2007) as well as infections acquired in hospitals (Toscano & Angela 1953) have been described.

In a literature revision, published in 1963, Humphrey found 70 cases of vulvar vaccinia related to vaccinations, including the 24 cases occurred in an infirmary, after contact, with an infected catheter, described by Toscano & Angela in 1953.

One case of vulvar infection with cow-pox occurred after direct contact with cows has been also described (Mittal et al. 1993).

Our cases however, are the first description in the country of person-to person transmission of a poxvirus, starting from an animal infection occurred in natural conditions, not related to vaccinations, reconfirming that vaccinia-like virus are circulating in Brazil (Schatzmayr et al. 2000)

A few zoonoses may be transferred through casual contact, but others are much more readily transferred by activities that expose humans to the semen, vaginal fluids, urine, saliva, feces and blood of animals. Many farms in the state involved in milk production are family enterprises, have a limited numbers of animals and less than optimal hygienic conditions (Simonetti et al. 2007). Gloves could avoid this contact but they are not usually used.

The poxvirus in AJV was possibly transmitted by direct contact of pustules in the husband’s hands or by her own hands. She had no lesions on her hands; only in the vulva.

Since the smallpox vaccination has been interrupted in our country, about 45 years ago, human poxvirus cases have been observed only in workers in direct contact with animals with lesions, but no human-to-human transmission had been confirmed. Most
patients had lesions only on the hands and fingers, but lesions on the face were also recorded. Almost all patients could not perform their normal activities for at least one week during their illness. In the patients, pain in the lesions, fever, regional ganglion inflammation, headache and prostration were described. The clinical course lasted about 3 weeks, with an incubation period after first contact with infected animals of 5 to 7 days (Costa et al. 2007). There is no specific treatment in human cases because the disease is normally self-limited, just local hygiene and symptomatic medicines (Schatzmayr et al. 2000; Schupp et al. 2001).

The implications for zoophilic contact of each emerging disease should be carefully assessed by practitioners. These cases show the necessity of mandatory notification of orthopoxviruses in cattle in regions where this disease is present, so that proper orientation can be given to medical professionals who work with farmers. Furthermore, as shown in this paper, there is the possibility of human-to-human disease transfer, which is a concern in terms of public health.

REFERENCES


