AN OUTBREAK OF VESICOPUSTULAR DISEASE IN HUMANS AND DAIRY CATTLE IN THE STATE OF RIO DE JANEIRO IN 2006

ABSTRACT

We describe an outbreak of a vesicopustular infection in humans and dairy cattle in the Municipality of Cordeiro, RJ. Virus particles have been observed by electron microscopy and two strains of orthopoxvirus have been isolated on Vero cells, from clinical specimens obtained from the two human cases. Antibodies for orthopoxvirus in humans and animals have been determined by a plaque reduction neutralization test using as antigen an orthopoxvirus isolated in the area and characterized by PCR as a vaccinia-like strain. The paper confirms the presence of infections by orthopoxvirus vaccinia-like viruses in the Southeast Region of Brazil.

INTRODUCTION

The presence of human cases with vesicopustular lesions in the Municipality of Cordeiro, related to infections in dairy cattle, was notified to the Secretary of Health of the state of Rio de Janeiro in January 2006. An epidemiological investigation carried out in the week 3 of 2006, detected two human cases, father and son, with vesicles which developed to open pustules with surrounding edema induration on the fingers, hands (Figure 1) and in one of patients, on his face. The patients reported malaise, lethargy and showed fever and painful swollen regional lymph nodes. Both cases were hospitalized for four days.

The patients have direct contact with dairy cattle in their farm. An investigation of the animals detected 15 cases of vesicopustular disease mainly on the udder, with some animals showing already crusts over the lesions and reduction of milk production.

In two animals, irreversible loss of teats was observed.

With full written consent of both patients, paired blood samples were collected during the acute phase of the disease and two weeks later, a blood sample was obtained and about 2 to 3 weeks after initial signs from the 15 cows, for confirmation of diagnosis.

Key words:

poxvirus, cattle, Rio de Janeiro
Vesicular content was also obtained from the human cases as well as crusts from one animal. In the laboratory the crushed crusts and vesicular fluids were suspended in small amounts of distilled water and all specimens observed with an electron microscope Zeiss model EM-900, after contrast with PTA 1% (Barth 1984). Particles of orthopoxvirus were observed in the human specimens at 30,000x magnification.

The same specimens have been positive by a PCR test (Damaso et al. 2000) and were inoculated in Vero cell culture, resulting in the isolation of two virus strains from the human specimens, both confirmed by electron microscopy as orthopoxviruses.

The antibodies in the human and animal serum specimens were titrated by an in-house neutralization test by plaque reduction. Briefly 50 microliters of the serum dilutions 1/5 to 1/640, were incubated at 37°C with 50 microliters of a virus dilution containing between 40 to 60 virus plaque units in a flat-bottom plate and a suspension of Vero cells was added to the wells, after incubation at 37°C for 1 hour. The plaques were counted after 48 hours incubation at 36°C by staining with crystal violet solution, containing formaldehyde. The 50% plaque reduction point was considered as the antibody titer. Positive and negative serum controls (rabbit serum immunized with vaccinia virus and fetal bovine serum respectively) were handled the same way as the sera to be tested. Antigen was an orthopoxvirus isolated in our laboratory at Instituto Oswaldo Cruz in 1999, from the lesions of a human case with similar symptoms in the Municipality of Cantagalo, confirmed as vaccinia-like by PCR test as described for the Cantagalo vaccinia-like strain (Damaso et al. 2000) and as an orthopoxvirus by electron microscopy.

The human sera showed an increase in the antibody titer between the acute and convalescent sera specimens, from 1/80 to 1/640 and from 1/160 to more than 1/640, respectively. All animal sera showed high antibody titers, between 1/80 to more than 1/640.

This outbreak confirms the circulation of orthopoxvirus vaccinia-like strains in the Southeast Region of Brazil (Damaso et al. 2000, Schatzmayr et al. 2000, De Souza et al. 2003, Nagase-Sugahara et al. 2004), and at the same time of parapoxvirus also (Barth et al. 2005). These vesicular infections may already be considered an emerging zoonotic disease and deserve the establishment of an active virus surveillance in the region. The disease may represent a serious economic loss if introduced into a dairy cattle herd, as observed in this episode, besides the brief incapacitating disease in humans in contact with the infected animals.

The possibility of the adaptation of these poxvirus strains to wild rodents and/or pet animals, which may carry the virus as observed with cow-pox virus in Europe, former Soviet Union republics and Northern Africa, should be carefully investigated, in order to establish measures for control of the disease in wildlife and prevention in domestic environments.

Figure 1: Lesions observed in the human cases, about three weeks after onset of the disease.

REFERENCES


