Serological evidence of Bartonella vinsonii lymphadenopathies in a child bitten by a dog

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INTRODUCTION

Bartonella species are gram-negative bacilli that belong to the alpha two subgroup of Proteobacteria. Bartonella species are being recognised as increasingly important bacterial pathogens in veterinary and human medicine [1]. These organisms can be transmitted by an arthropod vector or alternatively by animal scratches or bites [1]. Cat scratch disease (CSD) is caused by Bartonella henselae and is certainly the most common Bartonella zoonosis worldwide. Cats are the main reservoir of B. henselae, and the bacterium may be transmitted from cat to cat by the cat flea. The main clinical manifestation of typical CSD in an immunocompetent host remains lymphadenopathy and that appears approximately 2 weeks after inoculation.

Bartonella vinsonii subsp. arupensis appeared to be closely related to B. vinsonii subsp. vinsonii, another rodent-associated taxon, and to B. vinsonii subsp. berkhoffii, which was described recently in dogs [1]. These three subspecies have been reported to be agents of bacteraemia and endocarditis in dogs [1]. B. vinsonii subsp. berkhoffii and B. vinsonii subsp. arupensis have been reported to be rare agents of endocarditis in humans [2]. Here we report the first serological evidence of B. vinsonii infection, in a French child with multiple lymphadenopathies following a dog bite.

METHODS

The methods used for serological diagnosis were microimmunofluorescence (MIF) assay with a panel of antigens including B. henselae, Bartonella quintana, Bartonella elizabethae, B. vinsonii subsp. berkhoffii, B. vinsonii subsp. arupensis, B. vinsonii subsp. vinsonii and Bartonella alsatica, as well as Western-blot and cross-adsorption studies as previously described [2].

RESULTS

A 3.5-year-old girl was bitten on the cheek by a German shepherd in May 2007. The wound was stitched up and the child received a 10-day course of amoxicillin–clavulanic acid with correct healing and evolution. The girl was seen for consultation 3 weeks later for fever of 38°C and cervical lymphadenopathy and received symptomatic therapy. Her pain got worse and 1 week later she was hospitalised and three enlarged lymphadenopathies (two cervical and one submandibular) were found with a constant fever of 38°C. She was treated only with paracetamol, her condition improved and she was eventually cured after 1 month. The dog was euthanised by the owner without taking any blood samples. Bartonella sp. serology by use of MIF was positive, with immunoglobulin G (IgG) titres of 1:800 for all Bartonella spp. antigens tested. The causative role of B. vinsonii was proven by Western-blot following cross-adsorption. Western blotting performed using serum samples adsorbed with B. vinsonii subsp. vinsonii or B. vinsonii subsp. berkhoffii showed the disappearance of all cross-reactive antibodies (Fig. 1). Blood culture was negative.

DISCUSSION

Based on our findings, we believe that B. vinsonii should be added to the list of pathogens capable of causing lymphadenopathies in humans after a dog bite. It has been recently demonstrated that these bacteria could be detected in dogs’ saliva, suggesting that potentially viable Bartonella organisms may be transmitted to humans after a dog bite [3]. A positive diagnosis of a Bartonella sp. can be made even when the Bartonella sp. involved is not tested in the assay due to antigen...
cross-reactivity. Western blotting performed after adsorption allowed a specific diagnosis of the species B. vinsonii but did not distinguish among subspecies as exemplified in our case. Unfortunately, only one blood sample was available for this patient, which remains culture and PCR negative. However, it is well known that the sensitivity of culture is low when compared with that of PCR-based detection methods, even in lymph nodes of CSD [4]. The current case reinforces the hypothesis that any Bartonella may cause human infections, including lymphadenopathy, in patients exposed to the bite of an infected animal. In a recent study, the most commonly identified infectious agent in lymphadenopathy was B. henselae (245 patients, 31.2%), the agent of CSD [5]. B. vinsonii should be added to the list of human pathogens responsible for such clinical manifestation, which could be transmitted after a dog bite. Further studies are needed to better understand the risk of transmission of Bartonella spp. from dogs to humans following bite wounds.

REFERENCES