A prospective study of cat scratch disease in children. Diagnosis and clinical outcome.

Kontou[1], A. Garoufi[1], A. Pagoni[1], V. Kontos[2], C. Billinis[3], V. Papaevangelou[1]

[1]2nd Department of Paediatrics, National and Kapodistrian University of Athens School of Medicine, [2]Veterinary Public Health, National School of Public Health, Athens, Greece, [3]Department of Microbiology and Parasitology, Faculty of Veterinary Medicine, University of Thessaly

Objectives

Cat-scratch disease (CSD) is a zoonotic disease with a worldwide distribution and occurs primarily in children and young adults. It is caused by *Bartonella henselae,* an obligatory intracellular gram-negative bacterium.

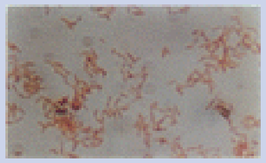


Figure 1. Gram Stain of a Clinical Isolate, Revealing Fine, Curved, Lightly Staining Gram-Negative Rods (×610), source NEJM[1]

Cats, especially kittens, are usually asymptomatic carriers that transmit the pathogen to humans by a scratch or bite. The classical form of CSD typically presents as lymphadenopathy usually preceded by an erythematous papule at the inoculation site. Affected nodes are often tender and occasionally suppurate. Low-grade fever and malaise accompany lymphadenopathy in ~50% of patients. Immunocompetent persons develop a benign, subacute self-resolving lymphadenopathy and rarely forms of the disease involving other organs, whereas immunocompromised individuals may develop significant life-threatening disease. The clinical spectrum of the disease is ever expanding and there is an increasing scientific interest for members of the genus *Bartonella*.

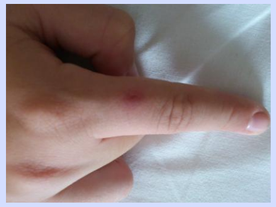
The aim of the study was to report the efficiency of PCR in different clinical samples to the diagnosis and the clinical outcome of the disease.

Methods

Fourteen children admitted to our department with a history of cat scratch, bite or physical contact and lymphadenopathy with or without fever were tested for *B. henselae*. Demographic and clinical data were collected by the time of admission (pictures 2-6).

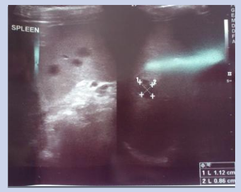
Blood serum samples were examined by the method of indirect immunofluorescent assay (IFA) in order to identify specific *B. henselae* antibodies (*Bartonella* IFA IgG, Focus Diagostics, Cypress, SA). Whole blood samples and lymph node specimens when available were tested by PCR.

Figures 2 and 3. Inoculation site and regional lymphadenopathy, Patient C.



Figures 4 and 5. Inoculation site and regional lymphadenopathy, Patient D.

DNA was extracted from whole blood samples, using the QIAamp DNA Mini kit (Qiagen, Valencia, CA, USA). Detection of Bartonella DNA by PCR was performed at 25 μl total reaction volume. Primers used were obtained from Syntezza (Israel), as previously described[2]. These primers amplify a region of 16S-23S ribosomal RNA intergenic spacer (ITS). One positive (DNA extracted from Bartonella henselae from culture) and one negative control were included in each reaction. PCR products were electrophorised in 2% agarose gel. The band of interest was excised and DNA was isolated using the QIAquick gel extraction kit (Qiagen, Valencia, CA, USA) according the manufacturer's instruction.



Figures 6. Splenic abscesses in U/S, Patient D.

Results

Sera of eleven children were found positive by IFA, with an antibody titer between 1/64 and 1/512. PCR of whole blood was negative in all children irrespectively of the presence of fever at the time of examination or previous antibiotic therapy. *B. henselae* was isolated only from a lymph node specimen, which was collected by surgical procedure .

Patient	Age (years)	Clinical presentation of CSD	Abs Bartonella	PCR Bartonella
A	4,5	Lymhadenitis	1/128	negative
B	8,5	Lymhadenitis	1/512	negative
C	4	Lymhadenitis	1/128	negative
D	11	Lymhadenitis	1/128	negative
E	6,5	Lymhadenitis	1/128	negative
F	8	Lymhadenitis-hepatosplenic abscesses	1/64	negative
G	12	Lymhadenitis	>1/256	negative (blood), positive (lymph node)
H	10	Fever-hepatosplenic abscesses	1/128	negative
I	8	Lymhadenitis-hepatosplenic abscesses	>1/256	negative
J	2,5	Lymhadenitis	1/512	negative
K	13	Lymhadenitis-hepatosplenic abscesses	1/64	negative

Table 1. CSD patients, IFA and PCR results

Children with CSD received appropriate PO or IV antibiotic treatment, accordingly to clinical findings. Patients with hepatic or splenic abscesses responded later than those with regional lymphadenopathy. No relapse was reported.

Conclusions

PCR of whole blood did not detect B. henselae in our CSD patients, irrespectively of whether they had fever or not. When lymph node biopsy is performed, PCR can be a useful diagnostic tool. The combination of history of cat contact, lymphadenopathy and positive serology remains the cornerstone of the diagnosis of CSD.

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