

Spotted fever rickettsiosis in Coronel Fabriciano, Minas Gerais State

Rickettsiose do grupo das febres maculosas na cidade de Coronel Fabriciano, Estado de Minas Gerais

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Abstract We report cases of spotted fever rickettsiosis in Coronel Fabriciano Municipality of Minas Gerais State, Brazil. The cases occurred in May and June of 2000. During this period there were two deaths among children from an area named *Pedreira* in a periurban area of this municipality. In a boy who died with clinical manifestations of Brazilian spotted fever, a necropsy revealed the presence of a spotted fever group Rickettsia. The serological results confirm the difficulty in the differential diagnosis of patients with symptoms of rickettsial diseases.

Key-words: Rickettsiosis. Brazilian spotted fever. Rickettsia rickettsii. Rickettsia typhi. Rickettsia felis.

Resumo São reportados casos de rickettsioses do grupo das febres maculosas no município de Coronel Fabriciano, Estado de Minas Gerais, Brasil. Os casos ocorreram nos meses de maio e junho de 2000. Durante este período, ocorreram dois óbitos em crianças procedentes de uma área peri-urbana conhecida como *Pedreira* no município de Coronel Fabriciano. Em um menino, que faleceu com manifestações clínicas da febre maculosa brasileira, à necropsia foi revelada a presença de Rickettsia do grupo das febres maculosas. Os resultados sorológicos confirmaram a dificuldade no diagnóstico diferencial de pacientes com sintomas de doenças rickettsiais.

Palavras-chaves: Rickettsiose. Febre Maculosa. Rickettsia rickettsii. Rickettsia typhi. Rickettsia felis.

The pathogenic *rickettsiae* are a group of obligately intracellular bacteria responsible for a variety of human diseases. *Rickettsia rickettsii* causes the rickettsial disease with the highest case fatality ratio currently in Brazil² and is transmitted by the tick *Amblyomma cajennense*³. This disease called Brazilian spotted fever (BSF) was first described in Brazil by Piza as a disease equivalent to Rocky Mountain spotted fever in the United States⁴. In Brazil BSF is known to occur in

the States of Minas Gerais, São Paulo, Rio de Janeiro, Espírito Santo and Bahia². *Rickettsia typhi* associated with rats and fleas has also been described in several publications². Recent data showing the presence of antibodies to *Rickettsia felis* in sera from patients with fever and rash in Brazil and *R. felis* DNA in the serum of one patient indicate that *R. felis* is a new Rickettsial disease in this Country⁵. We report cases of spotted fever rickettsiosis in Coronel Fabriciano Municipality in Minas Gerais State, Brazil.

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MATERIAL AND METHODS

The cases occurred in May and June of 2000. Twenty one suspected cases presenting with fever and skin rash were notified in Coronel Fabriciano Municipality (Figure 1) during this period. The majority of the cases came from a periurban area with rural characteristics named *Pedreira*. Among these 21 suspected cases, two children (12 and 15 years) died. They were brothers who lived in the same house. The first one to become ill was 12 years old and during the course of his disease presented fever, nausea, vomiting, diarrhea, abdominal pain, headache, myalgia and edema. Terminally he developed renal failure and stupor. The second fatal case developed fever, rash, nausea, vomiting, diarrhea, abdominal pain, headache, myalgia, jaundice and renal failure. Both cases reported a tick bite.

The sera of 21 patients with fever and rash were tested by indirect immunofluorescence assay (IFA)¹ for the presence of antibodies reactive with *R. rickettsii*, *R. typhi* and *Ehrlichia chaffeensis*. A necropsy was performed on the second fatal case with collection of tissue samples of skin, brain, stomach, liver, spleen, and kidneys. These materials were fixed in neutral-buffered formalin and shipped to the Rickettsial and Ehrlichial Diseases Research Laboratory, Department of Pathology, University of Texas Medical Branch (UTMB) at Galveston, USA. Immunohistochemical examination for spotted fever rickettsiae was performed as described previously⁶. DNA was extracted from the same material and evaluated by PCR amplification of the *Rickettsia* 17 kDa gene⁷.



Figure 1 - South America with localization of Minas Gerais State and Coronel Fabriciano Municipality.

RESULTS

Immunohistochemical evaluation of the necropsy materials utilizing an IgM monoclonal antibody against an LPS epitope specific for *Rickettsia* of the spotted fever group demonstrated intraendothelial rickettsiae in the second fatal case (patient JFM). PCR performed on the necropsy materials were not conclusive, presumably owing to the use of formalin, which damages DNA.

Among the suspected cases, four had antibodies to *R. rickettsii* by IFA with a titer of 1:64 (Table 1). None had antibodies to *R. typhi*, *R. felis* or *E. chaffeensis* as determined by IFA at a dilution of 1:64.

Table 1- Seroreactivity to *Rickettsia rickettsii* by IFA in sera from Coronel Fabriciano Municipality - 2000, Brazil.

Identification	IFA (Titer 1:64)
DBS (first sample)	1:64
DBS (second sample)	1:64
JFM*	1:64
JLOS	1:64
TRFG	1:64

Note: * 15-year-old boy who died.

DISCUSSION

The serologic results demonstrated that it was possible to suspect a diagnosis of spotted fever rickettsiosis in only four cases. They were not capable of confirming spotted fever rickettsiosis or even of identifying the species of *Rickettsia* involved in these cases, as there is broad cross-reactivity between spotted fever group rickettsiae. Among these cases was that of a 15-year-old boy whose diagnosis of spotted fever rickettsiosis was confirmed by immunohistochemical tests on necropsy material.

These results demonstrate clearly the difficulty in the differential diagnosis among the various rickettsial diseases and between rickettsial diseases and other non-rickettsial diseases with fever and rash, such as dengue fever. The contribution of molecular biology and good surveillance can help to elucidate the microbial species of rickettsiae involved in many cases of unrecognized fever and deaths due to *Rickettsia* in Brazil.

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