A Prospective Study of Rickettsia sibirica Infection in Members of Scientific Expeditions to Northern Asia

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INTRODUCTION

Rickettsia sibirica, the cause of Asian tick typhus, is a member of the spotted fever group of Rickettsia and is naturally transmitted by hares, voles, and mice, among other hosts.

METHODS

Study design and subjects. In 2001 and 2002, we asked North American scientists who, under the auspices of New York City's American Museum of Natural History, were about to board for polar expeditions to join us in participating in this study. Of 10, 3000 were eligible; one declined to participate, and one was lost to follow-up. 13 subjects completed the study. Control subjects consisted of 13 healthy persons and 13 intensive care patients who had been referred from expeditions of approximately the same duration, during the winter period, to continents other than Asia. Each subject was enrolled only once.

Participants. Upon return from the expedition, subjects and controls filled out a questionnaire that asked about exposure to ticks, recent contact with infected animals, and the patient's history of disease among non-natives. The patient's medical history was obtained from clinical notes and medical records.

RESULTS

Of the 13 persons who went on expedition to Mongolia in 2001 or 2002, 8 had a fever syndrome with 5 additional features: characteristic of tick-borne fever. One had 11 symptoms that were specifically noted in our questionnaire: fever, headache, rash, cough, and a cold. The other 4 subjects had 6 of these 5 symptoms (Table 1). The illness subsided spontaneously in 2 subjects and lasted only a few days, with disappearance of symptoms in 2 weeks. One patient was lost to follow-up, and 1 subject died of pneumonia.

LIMITATIONS

Participants in this study likely had a more intense exposure to ticks and tick-borne infections than the average traveler to northern Asia and to other countries. In addition, we had a very small sample size, which limits the conclusions we are able to draw in terms of general epidemiology.

CONCLUSIONS

1. The patients whose clinical illness and serological results are summarized in the Table 1 represent the broadest group of Asian tick typhus in North America, and the fact that we were able to identify this group in our study shows that all had symptoms suggestive of acute tick-borne infection and that all had high levels of IgM. The serological results are presented in Table 1.

2. The clinical symptoms of Rickettsia sibirica infection are similar to that of other tick-borne infections of the spotted fever group, with fever, headache, muscle pain, and rash. The diagnosis of rickettsiosis is confirmed by serological tests, and the use of antibiotics is not indicated until the diagnosis is confirmed.

3. Travelers and their physicians should have a high index of suspicion for acquired rickettsiosis in patients who return from an endemic area with a characteristic illness, even in the absence of a documented tick bite. Pre-travel information, the keeping of diaries (Figure 1), and serological tests are useful in formulating a differential diagnosis and determining the presence of infection among patients who work in an endemic area. Additional monitoring also facilitates immediate intervention should an illness emerge.

REFERENCES

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