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Original article

Epidemiological, clinical and laboratory features of murine typhus in central Tunisia

Aspects épidémiologiques et biologiques du typhus murin dans le centre de la Tunisie

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Abstract

Objective. – Murine typhus is an endemic zoonosis. It is difficult to diagnose because of its non-specific clinical manifestations. Our objective was to describe the epidemiological, clinical, laboratory, and treatment features of murine typhus.

Methods. – We conducted a retrospective study of 73 adult patients hospitalized for murine typhus from 2006 to 2011. The diagnosis was confirmed by a single titer of IgM \geq 128 or by seroconversion to typhus group antigen identified by indirect fluorescent assay.

Results. – The mean age of patients was 33.1 years (range, 13–68 years). Thirty-eight patients (52%) lived in rural or suburban areas; neither fleabites nor exposure to rats were reported. The most common clinical symptoms were: fever, headache, and myalgia. A maculopapular and non-confluent rash was observed in 47 patients (64.4%). No inoculation eschar was observed in any patient. Eight patients presented with interstitial pneumonia and two with lymphocytic meningitis. The diagnosis was confirmed by indirect fluorescence assay in every case. A single titer of IgM \geq 128 was found in 62 (84.9%) cases. The other 11 cases were diagnosed by seroconversion. All patients were given antibiotics. Tetracyclines were prescribed in 57 cases (78%). The two patients presenting with meningitis were treated with fluoroquinolone. The outcome was favorable for all patients and no relapse was observed.

Conclusion. – The features of murine typhus are non-specific. The definitive diagnosis is based on serologic testing by indirect fluorescent assay. Cyclins were the most prescribed antibiotics.

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Keywords: Murine typhus; *Rickettsia typhi*; Tunisia

Résumé

Objectif. – Le typhus murin est une zoonose endémique posant un problème diagnostique du fait de ses manifestations cliniques non spécifiques. L'objectif de cette étude était de décrire les caractéristiques épidémiologiques, cliniques, biologiques et thérapeutiques du typhus murin.

Méthodes. – Il s'agit d'une étude rétrospective portant sur 73 malades hospitalisés pour un typhus murin durant la période 2006–2011. Le diagnostic était confirmé par la présence d'un titre d'IgM $>$ 128 ou par la séroconversion objectivées par l'immunofluorescence indirecte.

Résultats. – L'âge moyen était de 33,1 ans. Trente-huit malades (52 %) provenaient des zones rurales ou suburbaines. Aucune exposition aux rats ni piqûre de puce n'était rapportée. Le tableau clinique était dominé par la fièvre, les céphalées et les myalgies. Une éruption cutanée maculopapuleuse était notée dans 47 cas (64,4 %). Aucun malade n'avait présenté une escarre d'inoculation. Huit malades avaient une pneumopathie interstitielle et 2 une méningite lymphocytaire. Le diagnostic était confirmé par l'immunofluorescence indirecte dans tous les cas. La présence d'un titre d'IgM \geq 128 était notée dans 62 cas (84,9 %) et la séroconversion dans 11 cas. Tous les malades avaient reçu une antibiothérapie. Les cyclines étaient prescrites dans 57 cas (78 %). Les 2 patients ayant une méningite étaient traités par les fluoroquinolones. L'évolution était favorable dans tous les cas sans rechute.

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Conclusion. – Les aspects cliniques du typhus murin ne sont pas spécifiques. Le diagnostic est basé sur des tests sérologiques par immunofluorescence indirecte. Les cyclines étaient les molécules les plus prescrites.
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Mots clés : *Rickettsia typhi* ; Typhus murin ; Tunisie

1. Introduction

Murine typhus is an endemic zoonosis caused by *Rickettsia typhi* an intracellular bacterium. Its main vector is the rat flea, *Xenopsylla cheopis*. Murine typhus is difficult to diagnose because of its nonspecific clinical manifestations.

We had for aim to describe the epidemiological, clinical, laboratory, and treatment features of murine typhus.

2. Patients and methods

We conducted a retrospective study of 73 adult patients hospitalized for murine typhus in the infectious diseases department of the Monastir university hospital (Tunisia), from 2006 to 2011. The minimal presumptive clinical criteria for the diagnosis of murine typhus were the presence of fever, headache, and/or skin rash. The diagnosis was confirmed by a single high IgM titer ≥ 128 , or by seroconversion to typhus group antigen by indirect fluorescent assay (IFA). All sera cross-reacted to *Rickettsia conorii* antigen at a lower titer. The epidemiological, clinical, laboratory, and treatment data was collected from the patients' charts.

3. Results

The patients' mean age was 33.1 years (range, 13–68 years). Forty-seven out of 73 were male patients (64%), and 26 were female patients (36%). A seasonal pattern (87.6% from June to September) was identified (Fig. 1). Thirty-eight patients (52%) lived in rural or suburban areas; neither fleabites nor exposure to rats were mentioned.

The most common clinical symptoms were: fever in 73 patients (100%), headache in 63 (86.3%), and myalgia in 49 (67.1%). A maculopapular and non-confluent rash was observed

in 47 patients (64.4%). No inoculation eschar was found in any patient (Table 1).

Sixteen patients (21.8%) presented with dry cough. A diagnosis of pneumonia was made for eight patients (10.9%) presenting with interstitial infiltrates on chest X-ray.

Meningitis was diagnosed in two patients presenting with meningeal inflammation without focal or generalized cortical dysfunction. The cerebrospinal fluid count revealed lymphocytic meningitis. Gram-stained smear and culture were negative. Blood tests confirmed the diagnosis for these two patients. One patient underwent an ophthalmic examination; white lesions infiltrating the inner retina suggested a rickettsial infection. Fluorescein angiography revealed a retinal vascular involvement, including retinal hemorrhages and vasculitis.

Routine laboratory tests yielded a mean white blood cell count (WBC) of $7900/\text{mm}^3$ ($3100\text{--}16,300/\text{mm}^3$) and a mean platelet count of $168,452/\text{mm}^3$ ($34,000\text{--}345,000/\text{mm}^3$). Leukopenia ($\text{WBC} < 4500/\text{mm}^3$) was observed in six patients (8.2%) and thrombocytopenia (platelets $< 150,000/\text{mm}^3$) in 38 patients (52%). The C-reactive protein was $> 20 \text{ mg/L}$ in 62 patients (mean = 67.17 mg/L , [$1.2\text{--}238 \text{ mg/L}$]). The mean rate of aspartate aminotransferase (AST) was 75.9 U/L ($13\text{--}245 \text{ U/L}$) and that of alanine aminotransferase (ALT) was 70.6 U/L ($3\text{--}248 \text{ U/L}$). Liver enzyme levels were elevated in 60 patients (82.2%). None of patients presented with acute renal failure (Table 1).

Table 1

Clinical, laboratory, and therapeutic features of murine typhus.
Les aspects cliniques, biologiques et thérapeutiques du typhus murin.

<i>Symptoms, n (%)</i>	
Fever	73 (100)
Headache	63 (86.3)
Myalgia	49 (67.1)
Rash	47 (64.4)
Eschar	0 (0)
<i>Laboratory findings, mean (range)</i>	
White blood cell count	$7900/\text{mm}^3$ ($3100\text{--}16,300/\text{mm}^3$)
Platelets	$168,452/\text{mm}^3$ ($34,000\text{--}345,000/\text{mm}^3$)
C-reactive protein	67.17 mg/L ($1.2\text{--}238 \text{ mg/L}$)
Aspartate aminotransferase (AST)	75.9 U/L ($13\text{--}245 \text{ U/L}$)
Alanine aminotransferase (ALT)	70.6 U/L ($3\text{--}248 \text{ U/L}$)
Plasma creatinine	$81.8 \mu\text{mol/L}$ ($46\text{--}113 \mu\text{mol/L}$)
<i>Antibiotic treatment, n (%)</i>	
Oxytetracycline	32 (43.8)
Doxycycline	25 (34.2)
Fluoroquinolones	13 (17.8)
Azithromycin	2 (2.7)
Cotrimoxazole	1 (1.3)

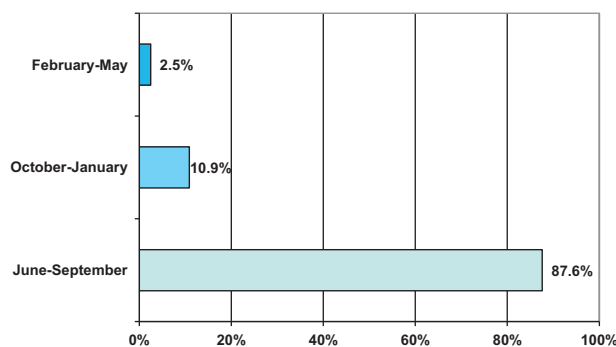


Fig. 1. Distribution of cases per season.
Distribution des cas par saison.

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