

# First case of imported African tick-bite fever in Poland – Case report

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## Abstract

This is the first report of a case of African tick bite fever (ATBF) imported to Poland from South-Africa. The patient presented with fever of 38.4°C, generalized maculopapular rash and single eschar. Diagnosis was confirmed by polymerase chain reaction (PCR) from eschar biopsies. The patient recovered without any sequelae after 7 days treatment with doxycycline.

## Key words

African tick-bite fever, *Rickettsia africae*, Poland, case report

## INTRODUCTION

African tick bite fever (ATBF) is one of the most important rickettsioses in sub-Saharan Africa. The causative agent is *Rickettsia africae*, a spotted fever group (SFG) rickettsiae. ATBF was long mistaken for Mediterranean spotted fever caused by *R. conorii*. The principal vectors/reservoirs for ATBF are *Amblyomma hebraeum* and *Amblyomma variegatum* ticks, which are abundant, aggressive and not host specific. Since the first description of *R. africae* as a human pathogen in 1992, ATBF has been recognized as endemic in southern African countries and especially in Republic of South Africa [1]. ATBF is a neglected disease and has recently emerged as a common cause of acute febrile illness in international travelers to rural sub-Saharan Africa. A recent worldwide report showed rickettsial infection incidence to be 5.6% in a group of travelers in whom acute febrile infection developed after they returned from sub-Saharan Africa [2]. Risk factors include game hunting, safari tourism, travel in the rainy season (November – April), and travel to southern Africa [3]. ATBF is the second most frequently identified cause for systemic febrile illness among travelers, following malaria. It occurred more frequently than typhoid fever and dengue fever [2]. *R. africae* has been detected by PCR in many African countries, including Niger, Burundi, Sudan, and in most countries of equatorial and southern Africa. However, the prevalence of ATBF among indigenous populations as well as the precise geographic distribution of *R. africae* remain largely unknown and warrant further epidemiologic studies on humans, mammals, and ticks in Africa [4].

African tick-bite fever often occurs in clusters, affecting a group of persons on the same trip. An incubation period of 6 – 10 days from the presumed tick bite to the onset of an abrupt influenza-like syndrome with fever frequently accompanied with regional lymphadenopathy, maculopapular rash, and inoculation eschars, single or multiple. Symptoms of ATBF

are usually mild, but may be more severe in the elderly [5, 6]. Diagnosis of ATBF is usually based on serology, polymerase chain reaction (PCR), and isolation of etiologic agent in cell culture [5].

This is the first report of the first case of African tick-bite fever imported from South-Africa to Poland.

## CASE REPORT

On 6 December 2010, a 51-year-old Pole man sought care at the Department of Infectious Diseases in the Medical University of Lublin, eastern Poland, who presented with fever, chills, generalized maculopapular rash and single eschar localized on the right nipple (Fig. 1). He had been on a four day trip to Johannesburg and Durban (RSA) where he took part in a safari, and returned to Poland on 21 November 2010. He denied having been bitten by ticks. The first symptoms occurred 10 days later. On 1 December 2010, he noticed purulent discharge from the right nipple, which finally developed into typical eschars after three days. The onset was also with low-grade fever. On 3 December 2010, he had a fever of 38°C with chills. One day later, after the onset of fever, he developed generalized maculopapular purpuric rash. Similar symptoms occurred among other travelers from the same group. Unfortunately, information about the other members was unavailable.

Physical examination on admission revealed fever of 38.4°C, maculopapular rash covering the whole body, single eschar localized on his right nipple. The patient provided written informed consent for blood samples and eschar swab. The total count of white blood cells was  $3.71 \times 10^3$  /L with 50% of granulocytes, 27% of lymphocytes, and 13% of monocytes. Aspartate aminotransferase activity was slightly elevated (51 IU/L). Blood and stool culture was negative. Malaria was excluded by serology and blood films analysis. The serology also excluded *Salmonella typhi* and *Salmonella paratyphi A, B, and C* infection. The sera of the patient and eschar swab were sent to the Faculté de Médecine Unité des Rickettsies, the WHO Collaborative Centre for Rickettsial Reference and Research in Marseille, France, for additional diagnosis.

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Indirect immunofluorescence (IF) [6] for rickettsial antigens of SFG and typhus group were negative. In addition, fever Q, tularemia, bartonellosis, ehrlichiosis were also excluded by serology. The PCR of eschar swab also excluded borreliosis and infection caused by *Coxiella burnetii*. The eschar swab was placed in 1 ml of MEM medium, and DNA was extracted from 200 µl of the solution (Qiagen), according to the manufacturer's instructions. The quality of DNA extraction was verified using quantitative real-time PCR (qPCR) for a house-keeping gene encoding beta-actin [7].

Diagnosis of ATBF was confirmed by positive qPCR from the eschar swab targeting two different genes: RC0338 gene (present in all SFG rickettsiae) and RAF\_ORF0659 gene (*R. africae*-specific) with the cycle thresholds value 31.33 and 27.72, respectively.

Culture of eschar swab in cell culture was negative at 28 days of follow-up.

## DISCUSSION

Although multiple cases of ATBF in travelers from Europe have been reported, no cases have been described for international travelers from Poland. Knowledge of the clinical manifestation of ATBF has been based on observation of travelers upon their return from rural southern Africa. The travelers manifested fever (88%), influenza-like syndrome (63%), inoculation eschars (95%), regional lymphadenopathy (43%), and rash (46%) [9]. The classical clinical triad of fever, eschar, and rash occurs in 50–75% of cases [10]. In the presented case, the patient confirmed the presence of fever, skin rash, and eschar. Roch et al. described severe clinical manifestations in elderly patients, including lymphangitis and myocarditis, and suspected brain involvement with slow complete recovery [8]. Auce et al. described internuclear ophthalmoplegia in a 29-year-old previously healthy male following ATBF [11]. In the current case, no complications were observed.

Epidemiological history is of key importance for the diagnosis; nevertheless, it must be borne in mind that patients often do not remember the tick-bite. Serology is the usual method of diagnosis, but the seroconversion with both IgM and IgG may not occur when doxycycline is given to patients with ATBF. Real-time PCR based methods are sensitive and specific for the identification of *R. africae*, but several studies reported lower sensitivity of whole blood samples compared with eschar specimens by PCR [12]. The specimen for the PCR analysis could be both eschar swab and biopsy. The effectiveness of these methods is comparable, but it has been reported that most health professionals prefer collecting swab samples over biopsy samples for patients and for themselves [13].

The patient in the presented case recovered without any complications after 7 days of therapy with doxycycline which is considered as the treatment of choice.

This case indicates that ATBF should be considered as a possible diagnosis in travelers with febrile disease returning from countries where *R. africae* has been detected.

## REFERENCES



**Figure 1.** Single inoculation eschar localized on right nipple

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