

To the Editors:

An unusual outbreak of Rickettsial infection among army soldiers engaged in reconnaissance mission in Northern Sri Lanka

N J Dahanayaka¹, S N Semage², K G Weerakoon³, P M N C Marage¹, R P V J Rajapakse⁴, S B Agampodi⁵

Ceylon Medical Journal 2017; **62**: 108-109

DOI: <http://doi.org/10.4038/cmj.v62i2.8477>

Rickettsial infections (RI) are re-emerging in Sri Lanka. Sero-epidemiological studies show that Spotted Fever Group (SFG) is more prevalent in the Central hilly part of Sri Lanka while Scrub Typhus (ST) is predominantly seen in peripheral wet and dry lands [1-2]. However, new, different types of rickettsioses have been described over last two decades worldwide. One such example is Tick Borne Lymphadenopathy (TIBOLA) caused by *Rickettsia slovaca*. It belongs to the SFG and was first described as a human pathogen in 1997 [3]. Clinical features of TIBOLA include a tick bite, an inoculation eschar especially on the scalp, cervical lymphadenopathy, fever seen only in 25-30% of patients and delayed antibody response [4]. Here we describe a rickettsial outbreak observed among army personnel engaged in reconnaissance missions in the Vanni jungles of Northern Sri Lanka.

We carried out a cohort study on patients with suspected clinical features of rickettsial infection admitted to the Army Base Hospital Anuradhapura (ABHA) from October to December 2012. Clinical features and investigation findings were carefully documented in the medical notes by the treating physician and medical officers of ABHA during the hospital stay. For serological confirmation, acute and convalescent sera samples were obtained on admission and two to four weeks after the initial symptoms. Immunofluorescent Antibody Assay (IFA) was done to detect IgM and IgG antibodies for prototype strains of *Rickettsia conorii* (Malish), *Orientia tsutsugamushi* (serotype Karp) and *Rickettsia typhi* (Wilmington) antigens. In addition repeat testing was carried out in 30 patients 10-12 weeks after the initial symptoms. Ethical clearance was obtained from the Ethics Review Committee of the Faculty of Medicine, Rajarata

University of Sri Lanka. Informed written consent was obtained from patients during the follow up clinic visits.

From October to December 2012, within a period of 6 weeks, 45 patients with clinical features suggestive of RI were admitted to the ABHA. All these patients were soldiers from a single isolated camp located in the Mulankawil area of the Kilinochchi District, deep inside the thick jungle with patches of surrounding scrub areas.

On examination, lymphadenopathy was observed in 42 (93.3%) patients, mainly in sub-mandibular, pre-auricular and cervical groups (Table 1). An eschar like lesion was observed in 24 (53.3%) patients mainly in conjunctiva and sclera. Only 12 (26.7%) patients had fever and arthralgia and myalgia was reported by less than 10% of the patients. None of them had skin rash or hepatosplenomegaly. With the clinical suspicion, patients were commenced on oral doxycycline 200 mg followed by 100 mg twice daily. All suspected cases responded to Doxycycline therapy and were sent home within 48 hours.

Immunofluorescent Antibody Assay (IFA) carried out to detect IgM and IgG antibodies for prototype strains of *Rickettsia conorii* (Malish), *Orientia tsutsugamushi* (serotype Karp) and *Rickettsia typhi* (Wilmington) antigens were negative on admission and 2-4 weeks later. However, repeated testing of sera from 30 patients 10-12 weeks after the initial symptoms showed positive IgM antibodies for *Rickettsia conorii* confirming 27 cases of acute SFG infections. However, none of the patients had positive IgM for *O.tsutsugamushi* or *R typhi* and IgG for *R.conorii*, *O.tsutsugamushi* and *R typhi*.

A rapid outbreak response was initiated on clinical suspicion of RI. Detailed investigations of soldiers showed that they were engaged in missions in different

Departments of ¹Medicine and ²Public Health, Sri Lanka Army Medical Services, Sri Lanka. Departments of ³Parasitology and ⁴Veterinary Pathobiology, Faculty of Veterinary Medicine and Animal Science, University of Peradeniya, Sri Lanka. ⁵Department of Community Medicine, Faculty of Medicine and Allied Sciences, Rajarata University of Sri Lanka.

Correspondence: NJD, e-mail: <niroshanajd@yahoo.com>. Received 26 January 2016 and revised version accepted 25 May 2017.



This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

Table 1. Clinical features on admission

| Clinical feature | Number (%) sero-positive patients (N = 27) | Number (%) all patients (N = 45) |
|--------------------|--|--|
| Fever | 7 (25.) | 12 (26.7) |
| Arthralgia | 1 (3.37) | 2 (4.4) |
| Myalgia | 3 (11.1) | 4 (8.9) |
| Headache | 8 (29.6) | 10 (22.2) |
| Eschar like lesion | 11 (40.7) | 24 (53.3) |
| Conjunctiva | 7 (25.9) | 16 (35.6) |
| Sclera | 4 (14.8) | 6 (13.3) |
| Face | 0 | 1 (2.2) |
| Chest | 0 | 1 (2.2) |
| Lymphadenopathy | 25 (92.6) | 42 (93.3) |
| Pre-auricular | 7 (25.9) | 12 (26.7) |
| Post-auricular | 0 | 1 (2.2) |
| Sub mandibular | 12 (44.4) | 23 (53.1) |
| Cervical | 3 (11.1) | 8 (17.8) |
| Supraclavicular | 0 | 1 (2.2) |
| Axillary | 0 | 1 (2.2) |

parts of the jungle. They were wearing military uniforms most of the time but used to sleep or lie on scrub lands without any sleeping material. Extensive exploration of the camp site revealed no signs of the presence of the vector. Disease onset had a unique pattern where first cases were reported among the soldiers engaged in reconnaissance missions, and then among two soldiers who were deployed in the signal room where the troops returning from the jungle first enter, followed by other soldiers of the camp. Troops were operating within a large area of the jungle and it was not strategically feasible to locate the source of infection and limit the missions. Prophylactic treatment with doxycycline 200 mg weekly for all soldiers who were engaged in these missions was initiated. In addition, uniforms and beddings of the whole camp were decontaminated by boiling in the water and dwellings were disinfected by spraying permethrin throughout the camp. At the entry point after returning from the jungle (the signal room), all uniforms were changed and decontaminated. All the soldiers were educated about the disease. Appearing of new cases was ceased within one incubation period of the outbreak response and none of the soldiers who received prophylaxis acquired the disease. Prophylactic treatment was continued throughout the monsoon season as previous data suggested of sporadic incidence during that period.

Clinical features similar to patients of current study have not been reported due to rickettsial infections earlier in Sri Lanka. In this study, *Rickettsia conorii* antigen was used to detect SFG rickettsiosis. *Rickettsia conorii* classically causes Mediterranean Spotted Fever, in which the clinical presentation is different that what we

observed. Patients included in the current study also had clinical symptoms somewhat similar to TIBOLA but without eschar on the scalp which is classically described in TIBOLA.

An interesting finding of the outbreak investigation was the pattern of disease transmission from jungle to signal room and then to the camp. This is most probably due to mechanical transport of vector lodged on uniforms through regrouping location (signal room in this instance) and should be noted in future outbreak investigations of RI.

Though there was only minimal evidence for doxycycline as a prophylactic agent in preventing Rickettsial infections the rapid response with doxycycline was adopted due to the urgency of the situation [5]. Even though we observed no cases after initiation of doxycycline chemoprophylaxis, further studies are needed to evaluate the proper effect. This outbreak investigation procedure provides strong evidence on need for proper surveillance and rapid response to control infectious diseases including RI. We strongly recommend further studies on rickettsial infections in the particular area in Sri Lanka specially to describe unusual clinical manifestations

Conflicts of interest

There are no conflicts of interest.

References

1. Liyanapathirana VC, Thevanesam V. Seroepidemiology of rickettsioses in Sri Lanka: a patient based study. *BMC Infect Dis* 2011; **11**: 328.
2. Premaratna R, Loftis AD, Chandrasena TG, Dasch GA, de Silva HJ. Rickettsial infections and their clinical presentations in the Western Province of Sri Lanka: a hospital-based study. *Int J Infect Dis* 2008; **12**: 198-202.
3. Raoult D, Berbis P, Roux V, Xu W, Maurin M. A new tick-transmitted disease due to *Rickettsia slovaca*. *Lancet* 1997; **350**: 112-3.
4. de Sousa R, Pereira BI, Nazareth C, Cabral S, Ventura C, Crespo P, et al. *Rickettsia slovaca* infection in humans. *Portugal Emerg Infect Dis* 2013; **19**: 1627-9.
5. Olson JG, Bourgeois AL, Fang RCY, Coolbaugh JC, Dennis DT. Prevention of scrub typhus. Prophylactic administration of doxycycline in a randomized double blind trial. *Am J Trop Med Hyg* 1980; **29**: 989-97.