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Two uncommon manifestations of leptospirosis: Sweet's syndrome and central nervous system vasculitis

Peter George*

Department of Medicine, Yenepoya Medical College, Mangalore, S India

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ABSTRACT

To leptospirosis is the commonest spirocheatal infection in the tropical and temperate countries of Indian sub-continent and Africa and the most common zoonosis worldwide. The protean manifestation of this infectious disease is a challenge for practising clinicians across the world. In poor developing countries, at most clinical suspicion it is essential in the diagnosis of this disease. In this report, we are able to document two uncommon manifestations of leptospirosis, namely Sweet's syndrome and central nervous system vasculitis.

1. Introduction

Leptospirosis is caused by the pathogenic spirochaete belonging to the genus *Leptospira*, family *Leptospiraceae*, and order *Spirochaetales*. The reservoirs of *Leptospira* are rodents, which are the most common source of human infections worldwide[1]. Leptospirosis is predominantly recognized as an occupational disease, it is now increasingly seen as a disease of water recreational sport[1]. *Leptospira* after entering the human body through abrasions produces leptospiremia affecting all systems. The disease is often self-limiting and nonfatal, despite the possibility of the severe form, Weil's disease[1]. In this report, we are able to identify two uncommon manifestations of leptospirosis, in a patient, namely Sweet's syndrome and central nervous system vasculitis.

2. Case report

An apparently healthy 45 year old woman with no co-morbid diseases, working as a farmer, presented with a 3 day history of fever and myalgias and a one day history of left sided hemiparesis and reddish skin lesions. On examination, she had tenderness of thigh muscles and had features of meningism. On examination of skin lesions, revealed multiple discrete erythematous papules and plaques (with central umbilication) over the face and limbs. Her neurological examination revealed left hemiparesis with upper motor neuron type of facial nerve palsy.

Investigations showed total leukocyte count of 15 500 cells (with 84% neutrophils), erythrocyte sedimentation rate (ESR) of 55 mm/hr, C-reactive protein (CRP)-44.8 & creatinine kinase (CPK)-1 790 IU/dL. Urine examination showed proteinuria and granular casts. Neuro-imaging of the brain done by CT scan, MRI & MRA was normal. CSF studies revealed 8 lymphocytes and protein was 65 mg/dL. Urine dark ground microscopy showed motile spirochetes and a positive serum IgM for *Leptospira*[2].

Since the patient being from an endemic area, being a farmer, and as she fulfilled the modified Faine's criteria[3] for diagnosis, possibility of leptospirosis with central nervous vasculitis was considered. She was treated with crystalline penicillin and steroids, with complete recovery of neurological deficits in 36 hours and regression of skin lesions over a week.

A biopsy of the skin lesion was performed. Histopathology from biopsy (Figure 1 & 2) of the skin lesions was suggestive of Sweet's syndrome (Acute febrile neutrophilic dermatosis). The skin biopsy was charecterised by hyperkeratosis and acanthosis of epidermis, neutrophilic infiltration and leukocytoclasis in lower dermis.

To rule out other associations of Sweet's syndrome, antinuclear antibody (ANA), LE cells, C-anti-neutrophil cytoplasmic antibody (c-ANCA), venereal disease research laboratory (VDRL), HIV, and Mantoux tests were performed and all were negative on testing.

*Corresponding author: Dr Peter George, MD, Associate Professor, Department of Medicine, Yenepoya Medical College, University Road, Mangalore - 575018, Karnataka, S India.
Tel: +91 9845177660, +91 824 2204670
Fax: +91 824 2204667
E-mail: drpetergeorge2002@yahoo.com

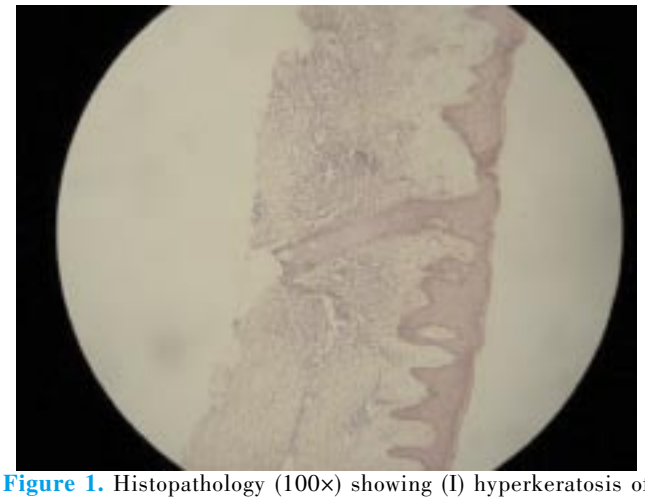

Figure 1. Histopathology (100×) showing (I) hyperkeratosis of epidermis (II) neutrophilic infiltration in the lower dermis.

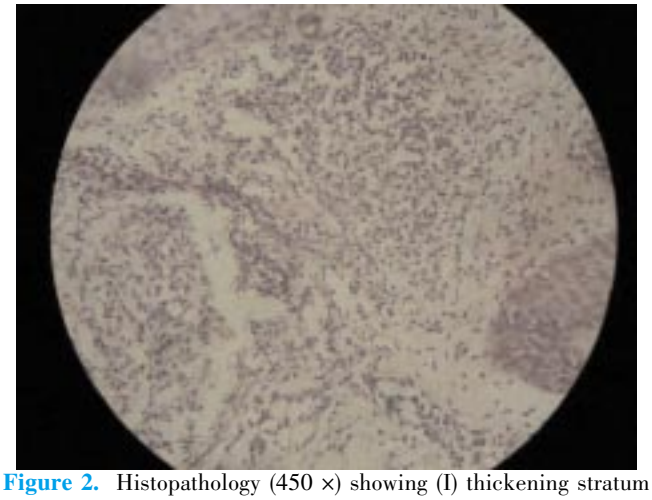

Figure 2. Histopathology (450 ×) showing (I) thickening stratum spinosum (II) dermis with neutrophils and leukocytoclasia with no evidence of vasculitis.

3. Discussion

The *Leptospira* enter the human body through mucous membranes or abraded skin which come in contact with contaminated water from environmental sources. After its entry through skin or mucosa the *Leptospira* multiply in the blood stream and also in various tissues. The resulting leptospiremia affects all systems, particularly the liver and kidney. The disease is most often self-limited and nonfatal, despite the possibility of severe complications involving various systems[1].

Diagnosis of leptospirosis is by identifying motile spirochaetes in urine by dark ground microscopy or by detecting Ig-M against *Leptospira*[2]. The more definitive tests for leptospirosis is by PCR, culture of blood or urine, and or a positive microscopic agglutination test[2]. This patient had positive urine microscopy and by IgM for *Leptospira* and also fulfilled the modified Faine's criteria for the diagnosis of leptospirosis[3].

The skin lesions found in this patient were multiple discrete erythematous papules and plaques distributed predominantly on the face and limbs, which were tender on palpation. To ascertain the pathology a skin biopsy was done. The histopathologic features of skin biopsy were typical of Sweet's syndrome[4].

Sweet's syndrome is otherwise known as acute febrile neutrophilic dermatosis. Sweet's syndrome is characterized by the clinical symptoms of fever, neutrophilia, tender erythematous skin lesions. The skin lesions may be localized or generalised. The lesions vary from papules and nodules to plaques. Sweet's syndrome is seen in three forms: the classical (or idiopathic), malignancy-associated, and drug-induced[5].

Classical Sweet's syndrome (CSS)[5] usually presents in women in the third and fourth decades of life and seen in association with various bacterial infections, connective tissue disorders, inflammatory bowel disease and pregnancy. The second type, the malignancy-associated Sweet's syndrome (MASS)[5] occurs as a para-neoplastic syndrome. It may be the first presenting symptom of a hematologic or solid organ malignancy. MASS could be even be the marker of recurrence of malignancy. The third type of Sweet's syndrome is drug-induced Sweet's syndrome (DISS)[5], mostly seen in patients treated with granulocyte-colony stimulating factor.

The pathogenesis of Sweet's syndrome remains to be established. It is postulated that the pathogenesis of Sweet's syndrome may be multi-factorial. Clinical and laboratory evidences points to that of a cytokine mediated aetiology[4,5].

Systemic corticosteroid is the treatment of choice in Sweet's syndrome. Other systemic drugs used are potassium iodide, colchicines, indomethacin, clofazimine, cyclosporine, and dapsone[5].

There are many reports of leptospirosis presenting with neurological manifestations. These involvements are from the direct infection of nervous system such as aseptic meningitis, meningo-encephalitis and acute behavioural changes. The immune mediated manifestations include demyelination and polyneuritis[6]. Patients with vasculitis of the nervous system present as stroke with neurological deficits; such as and hemiparesis or monoparesis[7].

The disease can be treated with doxycycline, penicillin, ceftrioxone or azithromycin based on the severity of the disease[8]. The disease can be prevented by administering doxycycline as prophylaxis in individuals at risk of exposure to contaminated water.

In the review of literature, the association of Sweet's syndrome as a manifestation of leptospirosis has not been described and possibly this is the only report on the same. To our knowledge this is the first report of leptospirosis presenting with Sweet's syndrome and central nervous system vasculitis, its two uncommon manifestations.

Conflict of interest statement

We declare that we have no conflict of interest.

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