

Rickettsial Epididymo-Orchitis – An Emerging Threat in Endemic Areas

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Abstract

Introduction: Rickettsial infections are reemerging infections in various parts of the world. Although there can be protean manifestations of rickettsial infection, epididymo-orchitis is by far uncommon. **Materials and Methods:** Fifty patients with a mean age of 35.1 (17–67) years with signs and symptoms suggestive of acute epididymo-orchitis were evaluated and 15 of these positive for Weil–Felix Reaction were included in the study after ruling out the common causes of epididymo-orchitis. **Results:** Fifteen patients had positive Weil–Felix reaction and were considered to have rickettsial epididymo-orchitis. Seven patients had right, 5 had left, while 3 had bilateral epididymo-orchitis. Most of the patients presented within 2 weeks of onset of symptoms. Five patients were positive for OX2, four patients were positive for OXK titers, four for OX19 and OX2, while two were positive for OX19 Weil–Felix reaction. These patients were started on doxycycline 100 mg bd for 7 days and followed up. In the follow-up, none of them developed complications of testicular abscess or chronic epididymo-orchitis. **Conclusion:** Rickettsial epididymo-orchitis is a very rare entity and it as an emerging threat in endemic areas. We strongly recommend that in the areas endemic for Rickettsia, all cases of epididymo-orchitis should be evaluated for the presence of rickettsial infection, as early identification of such an infection would lead to prompt and precise management.

Keywords: Endemic, Rickettsial epididymo-orchitis, scrub typhus, Weil–Felix reaction

INTRODUCTION

Rickettsial infections are reemerging infections in various parts of the world.^[1,2] In India, these infections are reported from various states including Karnataka, Jammu and Kashmir, Himachal Pradesh, Uttaranchal (now Uttarakhand), Bihar, West Bengal, Meghalaya, Rajasthan, Maharashtra, Tamil Nadu, and Kerala^[3-6] Rickettsial infections are zoonotic infections and human beings are affected accidentally. The diagnosis of these infections is really difficult owing to a very low index of suspicion, nonspecific presentation, and unavailability of specific and sensitive investigations.^[7] Although there can be protean manifestations of rickettsial infection, epididymo-orchitis is by far uncommon.^[8-10] To the best of our knowledge, there are only two case reports^[11,12] of rickettsial epididymo-orchitis.

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MATERIALS AND METHODS

Fifty patients presenting to the urology outpatient department in the study period from January 2016 to January 2017 with a mean age of 35.1 (17–67) years with signs and symptoms suggestive of acute epididymo-orchitis were evaluated by detailed history, clinical examination, and investigations such as ultrasonography (USG) of the scrotum, complete blood count, and Weil–Felix reaction and the usual conditions causing epididymo-orchitis like urinary tract infection, bacterial sepsis, tuberculosis, brucellosis, filariasis, and leukemia were ruled out by proper history, examination, and relevant investigations and those found positive for Weil–Felix reaction were included in the study.

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RESULTS

Of 50 patients studied, 15 patients, i.e., 30%, had positive Weil–Felix reaction and were considered to have rickettsial epididymo-orchitis. Seven patients had right, 5 had left, while 3 had bilateral epididymo-orchitis. The clinical presentation of patients is summarized in Table 1. Most of the patients presented within 2 weeks of onset of symptoms [Graph 1]. On routine investigations, seven patients had leukocytosis and five had raised erythrocyte sedimentation rate (ESR). USG of the scrotum with Doppler was done in six patients, either to rule out torsion testes or testicular abscess [Figures 1-3]. Five patients were positive for OX2, four patients were positive for OXK titers, four for OX19 and OX2, while two were positive for OX19 Weil–Felix reaction [Table 2]. These patients were started on doxycycline 100 mg bd for 7 days and followed up clinically at 7 days, 1 month, 3 months, and 6 months. In the follow-up, none of them developed complications of testicular abscess or chronic epididymo-orchitis.

DISCUSSION

Rickettsial diseases are common endemic diseases which are underdiagnosed because of unusual presentation.^[12] There is a reemergence of rickettsial infections, particularly scrub typhus in India.^[2,13,14] In a study done by Kalal *et al.*,^[7] majority of cases were reported from Karnataka (50%), followed by Andra Pradesh and Tamil Nadu. Scrub typhus and spotted fever diseases are the most commonly reported diseases from Asia.^[15]

Scrub typhus most commonly presents with fever, the other symptoms being rash, hepatosplenomegaly, and lymphadenopathy.^[16,17] There is no specific clinical picture

of these infections which can be considered diagnostic.^[18] Their clinical picture reported from India is highly variable which is because of infections caused by different rickettsial strains which show high antigenic variation.^[3,19,20] The delay in diagnosing these infections is usually caused because of an unusual presentation. Although the presence of eschar hints



Figure 1: Ultrasound image

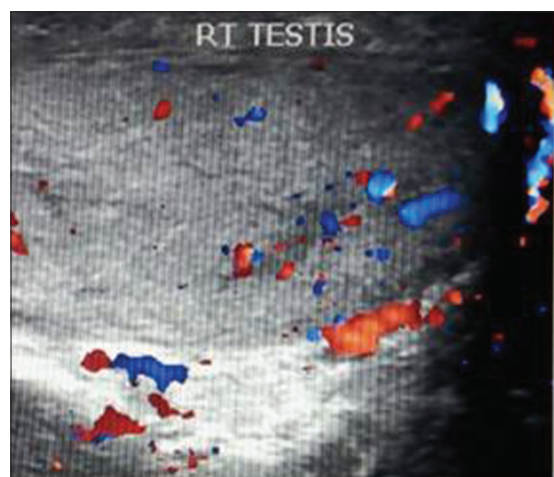


Figure 2: Color Doppler ultrasound image

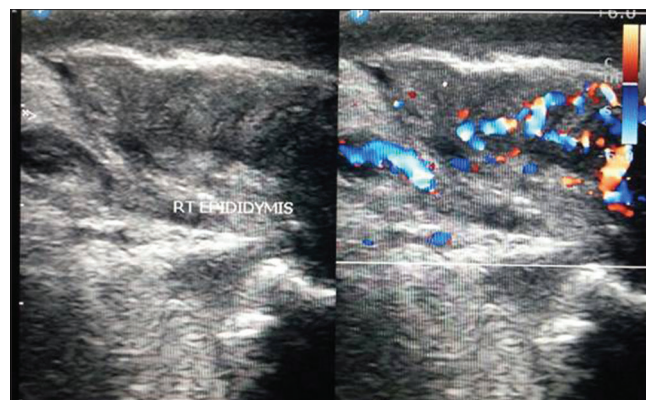


Figure 3: Grey scale and color Doppler image

Table 1: Clinical Presentation

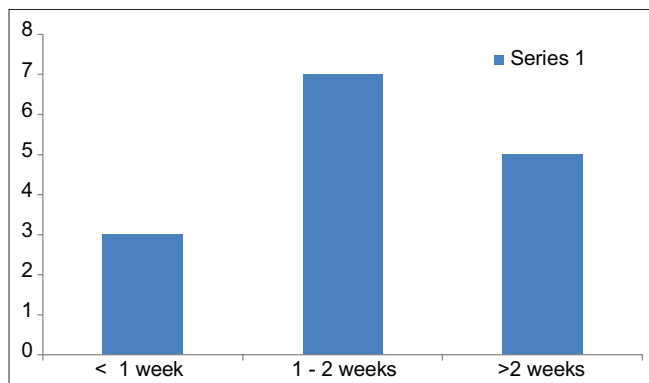
S.No.	Symptoms	No. of patients	Percentage (%)
1.	Pain	15	100
2.	Scrotal Swelling	15	100
3.	Fever	07	46.7
4.	Urinary Symptoms	00	00
5.	Rash, Eschar, Lymphadenopathy	00	00
6.	Tenderness Over Scrotum	15	100%
7.	Swelling Of Testes And Epididymal Thickening	15	100%
8.	Signs Of Acute Inflammation	07	46.7%
9.	Cord Thickening And Tenderness (Acute Funiculitis)	04	26.7%

Table 2: Weil Felix Reaction

S.No.	Strain agglutination positivity	No. of cases
1.	OX-19	2
2.	OX- 2	5
3.	OX- K	4
4.	OX-19 & OX- K	4

Table 3: Literature review

S. No.	Study	Age	Epididymo-orchitis laterality	Other symptoms	Rash and eschar	Weil-felix reaction
1.	Chandrashekhar C ^[9] et al	7 ½ Y Boy	Right	Fever, Puffiness of The Eye Lid, Bilateral Significant Cervical Lymphadenopathy	Rash – Present Eschar-absent	Negative
2.	V. Shanmugapriya ^[8] et al	5-yr Boy	B/l	Fever, Vomiting, Loose Stools, Diffuse Abdominal And Left Groin Pain	Absent	Not Done



Graph 1: Duration of symptoms

toward the diagnosis of rickettsial disease, it is found only in 30%–50% of cases.^[21,22] In a study performed by Kalal et al.,^[7] on the clinical picture and epidemiology of rickettsial infections, the most common clinical presentation was fever present in all the cases; only 30% of patients had a rash, 47% had lymphadenopathy, while eschar was an infrequent feature. In our cases, none of the case had other stigmata of rickettsial disease apart from fever. We subjected the patient to Weil–Felix reaction only as a part of our evaluation process of cases of epididymo-orchitis.

Epididymo-orchitis is an uncommon presentation of rickettsial disease.^[8–10] The cause of epididymo-orchitis is believed to be vasculitis caused by the infection.^[11] There are only two case reports in literature [Table 3] and both of them are cases of scrub typhus epididymo-orchitis diagnosed in South India. Scrub typhus is caused by *Orientia tsutsugamushi*, which a Gram-negative obligate intracellular parasite and affects human beings accidentally through the bite of chiggers (larva) of a trombiculid mite.^[11]

In cases of rickettsial infection, total leukocyte counts are normal to low normal in the early course of the disease and counts increase in the later course in about 30% of the cases.^[23] In cases reported by Shanmugapriya et al.^[11] and Chandrashekar et al.,^[12] the total leukocytic count was normal with elevated ESR. In our study, leukocytosis was seen in seven patients and raised ESR in five.

There are various investigations which can be used for the diagnosis of rickettsial infections like Weil–Felix reaction,

indirect immunofluorescence assay (IFA), ELISA, polymerase chain reaction (PCR), and immunohistochemistry and isolation of the organism. IFA is considered a gold standard for the diagnosis of rickettsial diseases; however, it is not easily available in India. Adding more, it is quite expensive and requires expertise to perform and takes more than a week for the results.^[24,25] PCR detects rickettsial DNA and is the most rapid assay but suffers problems of high cost, variable sensitivity, and unavailability.^[1] ELISA is a rapid test and can be used for the detection of immunoglobulin M (IgM) and IgG antibodies for the diagnosis of rickettsial epididymo-orchitis with a sensitivity and specificity of more than 90%.^[26,27] Immunohistochemistry and isolation of the organism are restricted only for research purposes.^[1] Weil–Felix reaction is a heterophile antibody test based on the sharing of antigens between *Rickettsia* and *Proteus* and it shows agglutinins to *Proteus mirabilis* strain OXK and *Proteus vulgaris* strain OX19 and OX2.^[18] This test is an inexpensive and a specific diagnostic tool and is easily available, but lacks sensitivity.^[18] However, it shows a good correlation with the IFA.^[28] In cases where definitive investigations are not available, this test can be used for the diagnosis of rickettsial infection.^[29,30] As per Isaac et al.^[31] at a titer of 1:80, although the sensitivity of the test is just 30%, its specificity and positive predictive value approaches 100%. In our study, we used Weil–Felix reaction for the diagnosis of the cases of rickettsial epididymo-orchitis due to the unavailability of the IFA.

Doxycycline is considered the drug of choice for the treatment of rickettsial epididymo-orchitis and should be given at a dose of 200 mg/day in adults weighing more than 45 kg for at least 3 days following defervescence or for a minimum period of 5–7 days.^[1] We used doxycycline in all of our patients at a dose of 100 mg twice a day for a period of 7 days. Clinical response was seen in all the patients within 48 h of the treatment and recurrence was seen in none of them. Other antibiotics that can be used for the treatment of rickettsial infection are macrolides,^[32,33] chloramphenicol, and fluoroquinolones, especially pefloxacin, levofloxacin, ciprofloxacin, and ofloxacin.^[34–38]

CONCLUSION

Rickettsial infections are reemerging infections in various parts of our country. Rickettsial epididymo-orchitis is a very rare entity and in lieu of a fairly good number of cases observed in

our study, we see it as an emerging threat in endemic areas. We strongly recommend that in the areas endemic for Rickettsia, all cases of epididymo-orchitis should be evaluated for the presence of rickettsial infection, as early identification of such an infection would lead to prompt and precise management. However, more studies from endemic areas using more sensitive and specific tests are required in future to establish the definitive diagnosis.

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Conflicts of interest

There are no conflicts of interest.

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