

Acute kidney injury in Scrub typhus patients of North East India

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Abstract

Background: Scrub typhus is becoming an increasingly common cause of kidney injury in India. The diagnosis could be overlooked if we do not have a good index of suspicion. It is being reported from various parts of India. However there is paucity of literature regarding this entity in North Eastern part of India.

Methods: This is a retrospective study done in two tertiary care centres in Manipur. The study looks into all cases of scrub typhus admitted in these centre during the study period from January 2015 to April 2020.

Results: 162 patients were diagnosed to have scrub typhus during the study period. Acute Kidney Injury was noted in 35 patients (21.6%). Seven patients had advanced renal failure requiring dialysis support. Nine patients (5.55%) died from complications of scrub typhus.

Conclusion: Scrub typhus is an infectious disease illness which can cause potentially severe disease with multi organ failure. Prompt treatment is associated with good response but treatment delay can lead to death. Scrub typhus should be considered in the differentials of fever with acute kidney injury in countries like India.

Keywords: Scrub typhus, acute kidney injury

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I. Introduction

Scrub typhus is an infectious disease caused by *Orientia tsutsugamushi* and is spread through bite of mites. The disease is becoming an important cause of acute kidney injury in south eastern part of Asia including India(1,2,3). Clinical presentation can vary from mild infection to severe form with multi organ involvement. Clinical picture usually presents a week after the bite of an infected chigger. Kidney involvement in scrub typhus includes urinary abnormalities –microscopic hematuria, proteinuria and acute kidney injury (4). Acute kidney injury can complicate scrub typhus infection. The incidence of acute kidney injury seems to be higher in elderly patients. The exact incidence of this infection and acute kidney injury is less studied for north eastern population of India. We conducted a retrospective study which looked in patients with scrub typhus and acute kidney injury from two large tertiary care centres in Manipur.

II. Methods and Materials

The study was conducted from data analysed from two large hospitals in Manipur (Jawaharlal Nehru Institute Of Medical Sciences and Raj Medicity). This is a retrospective study and looked into data of scrub typhus infection during the study period from January 2015 to April 2020. Jawaharlal Nehru Institute Of Medical Sciences is a teaching based government institute while Raj Medicity is a private hospital which also serve as a tertiary referral center. Diagnosis of scrub typhus was made based on clinical features and confirmed by serological assay using immunoabsorbent assay. Acute kidney injury (AKI) is defined as a rise of serum creatinine by more than 0.3 mg in 48 hrs period as per KDIGO definition (5).

Inclusion criteria

1. Patient with scrub typhus diagnosed during the study period from January 2015 to April 2020.

Exclusion criteria

1. Patients with age < 12 years of age

Statistical analysis

Statistical analysis was done using SPSS 16 version software. Continuous variables were expressed as means \pm standard deviation .Parametric students t test was used to compare the means with similar variances. Multivariate logistic regression analysis was done for identifying the risk factors of AKI .A p value of <0.05 was taken as significant.

III. Results

The demographic presentation, clinical picture and laboratory finding of those patients who presented with scrub typhus are as shown in Table 1.

162 patients were diagnosed to have scrub typhus during the study period .Acute kidney injury was noted in 35 patients .Seven patients had advanced renal failure requiring haemodialysis support .Severe pneumonia was noted in 11 patients of which 7 patients developed respiratory failure requiring invasive mechanical ventilation. 9 patients died from complications of scrub typhus infection.

Table no 1

	AKI (35)	NO AKI (127)	P value
Age	38.4 \pm 19.03	34.66 \pm 12.22	*
Age >65 years	6	3	
Sex (M/F)	27/8	94/33	*
Time to hospital presentation	9.51 \pm 2.7	5.95 \pm 2.09	P<0.001
Albumin	3.07 \pm 0.47	3.29 \pm 0.2	*
Hypotension at presentation/hospital stay	17 (48.5%)	2(1.5 %)	P<0.001
Severe pneumonia	11	0	P<0.01
ICU stay	14(40%)	0	<0.001
Eschar	13(37.1)	49(38.5%)	*
Death	9(25.7%)	0	
Mean age of patient who died	62 \pm 1.2		

*Denotes p value not significant

IV. Discussion

Scrub typhus is a vector borne disease caused by infection with *Orientia tsutsugamushi* which is a gram negative intracellular bacilli. Transmission occurs through the bite of larval forms of trombiculid mites (chiggers).It is being increasingly reported from various parts of india (1,2,46).

An eschar can be seen at the site of bite in approximately 46-88 percent of the cases(7,8) .The eschar initially presents as painless papular lesion which ulcerates and central part necroses forming dark crusted lesion. Patient usually presents as fever, headache and myalgia .The severity of infection can vary from mild infection to severe form with multi organ failure and death.

Acute kidney injury is being increasingly reported in scrub typhus .Pathogenic mechanism of Acute kidney injury in scrub typhus is multifactorial and has been attributed to pre renal state, septic shock, rhabdomyolysis(9) ,vasculitis and direct invasion of the kidney by the organism(10).

In our study, AKI was noted in 35/162 patients (21.6 %).Dialysis requirement was seen in 7/162 patients (4.32 %).This is comparable to studies from other parts of India(4,6) .

The predictor of AKI in our study include late presentation to hospital, hypotension at presentation or during hospital stay , severe lung involvement, ICU stay .Previous studies have shown age as predictor for development of AKI(Hwang et al) .However we found no correlation with age and AKI in our study. It could also be noted that our study predominantly comprised of young population. Correlation with hypotension, severe lung involvement, ICU stay and AKI has also been documented in other studies(4,6,12)

A mortality of 9/162 patients (5.55 %) was noted in our studies which is higher compared to other studies .All this patients had acute kidney injury and severe pneumonia requiring ICU stay. The higher mortality could be attributed to late referral to hospital. Many of these patients reside in remote hilly areas with poor accessibility to tertiary care centres. By the time they reach the hospital many of them are in severe sepsis and septic shock like presentation.

Our study is limited by its retrospective nature .Since the study was done in a tertiary centre , only the severe form of scrub could be over represented .

It is important to entertain the diagnosis of scrub typhus in acute kidney injury evaluation in endemic areas. This is an infection which could be easily treated but could have potentially lethal complications if treatment is delayed.

V. Conclusion

Scrub typhus is not an uncommon condition in the state of Manipur .It should not be overlooked as a cause of acute kidney injury in our local population .Prompt treatment is warranted to avoid potentially lethal complications.

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