

## Diagnosis and Management of Rickettsial Infections among Febrile Patients Attending in Inpatients and Outpatient Department in a District Hospital in Bangladesh

Dr. S. M. Abdul Munim<sup>1\*</sup>, Dr. Masuma Tasnim<sup>2</sup>, Dr. Zaka Kaif<sup>2</sup>, Dr. Md. Suave Arefen<sup>3</sup>, Dr. Md. Faysol Alam<sup>4</sup>, Dr. Anwara Khatun<sup>5</sup>

<sup>1</sup>Senior Consultant, Medicine, 250 Bed District Hospital, Joypurhat, Bangladesh

<sup>2</sup>Assistant Surgeon, 250 Bed District Hospital, Joypurhat, Bangladesh

<sup>3</sup>Medical Officer, Medicine, 250 Bed District Hospital, Joypurhat, Bangladesh

<sup>4</sup>Senior Consultant, Department of Otolaryngology and Head-Neck Surgery, Rangpur Medical College & Hospital Rangpur, Bangladesh

<sup>5</sup>Assistant Professor, Department of Pharmacology, Rangpur Medical College & Hospital Rangpur, Bangladesh.

DOI: [10.36348/sjmps.2023.v09i09.010](https://doi.org/10.36348/sjmps.2023.v09i09.010)

| Received: 14.08.2023 | Accepted: 20.09.2023 | Published: 25.09.2023

\*Corresponding author: Dr. S. M. Abdul Munim

Senior Consultant, Medicine, 250 Bed District Hospital, Joypurhat, Bangladesh

### Abstract

**Background:** Numerous obligatory intracellular bacteria from the Alphaproteobacteria genus *Rickettsia* can cause rickettsial infection. The most prevalent newly emerging and reemerging diseases are rickettsial infections. **Objectives:** The aim of the study was diagnosis and management of rickettsial infections among febrile patients attending in inpatient and outpatient department in a district hospital in Bangladesh. **Methods:** This cross-section observational study was carried out in the 250 Bedded District Hospital, Joypurhat. The duration of the period from March 2022 to February 2023. A total of 250 patients participated in the study. Both male and female with any age, patients with elevated body temperature, headache, malaise, rash, nausea, and vomiting and gave consent to be included in the study. Severely ill patients, not willing to participate were excluded from the study. Weil Felix test was used in this study and a titre of 1:80 was considered to be positive. Statistical evaluation of the results used to be obtained via the use of a window-based computer software program devised with Statistical Packages for Social Sciences (SPSS-24). **Results:** The mean age of the patients was  $39 \pm 1.9$ . 8% of the patients had  $\leq 18$  years of age. 16% were within the age group of 19-29 years, 28% were within the age group of 30-39 years, 24% were within the age group of 40-49 years, 14.4% were within the age group of 50-59 years and 9.6% were  $\geq 60$  years and 52% of the patients were male. 100% of the respondents had fever, 20% had generalized weakness, 15.2% had headache, 16% had cough and cold, 24% had body ache, 8% had vomiting and abdominal pain respectively, 4% had per nasal watery discharge, 36% had rash, 16% had nausea, 24% had anorexia and 4% had other symptoms. CBC & ESR and Weil Felix test were the most common (100%) investigation among the patients, Urine R/M/E in 68%, serum creatinine in 18%, USG of W/A in 15%, CRP in 18%, PBF in 7, Urine C/S in 10%, S. Electrolytes in 4% cases. We found 90 Rickettsial Infection positive patients. Doxycycline and Paracetamol and Esomeprazole were prescribed to all patients 90(100%) and followed by Linagliptin+Metformin to 20(22.22%), Glimipiride to 19(21.11%), Azithromycin to 18(20%) and Domperidon to 10(1.11%), Montelukast 9 (10%), Pantoprazole to 8(8.89%), Rupatadine to 7(7.77%), Ondansetron to 6(6.67%), Tiemonium to 5 5.57%), Fexofenadin to 4(4.44%) and other treatment along with the prescribed medicines was given to 40(44.44%) patients. Authors studied the response of Doxycycline which showed 85(94.44%) cases improved within 48 hours of start of treatment. Remaining 5(5.55%) cases showed delayed response due to late presentation. **Conclusion:** Rickettsial illness is inextricably linked to the sociocultural life of the majority of metropolitan residents. However, a lack of medical facilities and qualified doctors makes it challenging to identify rickettsial disease in febrile patients. It's important to make an early diagnosis when treating rickettsial illness.

**Keywords:** Rickettsial Infections, Febrile illness, Inpatients and Outpatient Department.

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### INTRODUCTION

Numerous obligatory intracellular bacteria from the Alphaproteobacteria genus *Rickettsia* can cause rickettsial infection. The most prevalent newly emerging

and reemerging diseases are rickettsial infections [1, 2]. The sickness caused by this infection is now endemic everywhere [3-5]. The most under-recognized emerging and re-emerging diseases, according to the Asian Union

**Citation:** S. M. Abdul Munim, Masuma Tasnim, Zaka Kaif, Md. Suave Arefen (2023). Diagnosis and Management of Rickettsial Infections among Febrile Patients Attending in Inpatients and Outpatient Department in a District Hospital in Bangladesh. *Saudi J Med Pharm Sci*, 9(9): 672-677.

for Food and Agriculture (AUI), are rickettsial diseases. Due to this bacterial pathogen, this condition might occasionally be the beginning of an exceedingly dangerous infection or a mild, self-limiting illness [6]. However, depending on the type of rickettsial infection and the level of infection, clinical signs of rickettsia infections may vary. Common symptoms such a fever, headache, lethargy, rash, nausea, and vomiting typically develop 1 to 2 weeks after infection [7]. However, determining the etiologic diagnosis of rickettsioses is challenging, and a full diagnosis frequently necessitates the examination of serum samples, particularly during the acute and recuperative phases of illness [8]. In a developing nation like Bangladesh, there is still a dearth of public healthcare facilities or constrained access to diagnostic tests. Therefore, it is essential to comprehend the prevalence of local infections in order to target the disease, carry out the appropriate diagnostic procedures for clinical diagnosis and follow-up, and formulate a treatment strategy [9]. Additionally, depending on the patient factor and causing agent, rickettsia infections may appear differently clinically [10]. The main barrier to early antibiotic therapy is the lack of adequate serological diagnostic test or culture facilities. Studies from Vijayapura and Gadag in the north of Karnataka, Shivamogga in the middle of Karnataka, and the southern part of rural Bangalore have documented rickettsial illness in both adults and children [11, 12]. Additionally, numerous studies had emphasised that administering doxycycline to patients with just a mild suspicion of having rickettsial disease clearly affected both the disease's course following therapy and the clinical prognosis within 48 hours [13]. Thus the aim of the study was diagnosis and management of rickettsial infections among febrile patients attending in inpatient and outpatient department in a district hospital in Bangladesh.

## METHODOLOGY

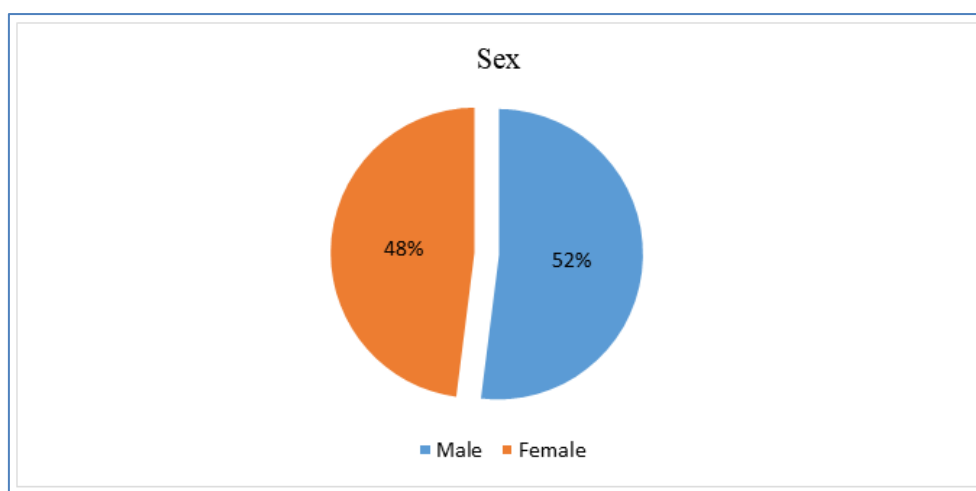
This cross-section observational study was carried out in the 250 Bedded District Hospital, Joypurhat. The duration of the period from March 2022 to February 2023. A total of 250 patients participated in the study. Both male and female with any age, patients with elevated body temperature, headache, malaise, rash, nausea, and vomiting and gave consent to be included in the study. Severely ill patients, not willing to participate were excluded from the study. Weil Felix test was used in this study and a titre of 1:80 was considered to be positive. Face to face interview was done to collect data with a semi-structured questionnaire. After collection, the data were checked and cleaned, followed by editing, compiling, coding and categorizing according to the objectives and variable to detect errors and to maintain consistency, relevancy and quality control. Statistical evaluation of the results used to be obtained via the use of a window-based computer software program devised with Statistical Packages for Social Sciences (SPSS- 24).

## RESULT

**Table 1: Distribution of the respondents by age**

Age group	N=250	%
≤18	20	8
19-29	40	16
30-39	70	28
40-49	60	24
50-59	36	14.4
≥60	24	9.6
Mean ± SD	39 ± 1.9	

The mean age of the patients was 39 ± 1.9. 8% of the patients had ≤18 years of age. 16% were within the age group of 19-29 years, 28% were within the age group of 30-39 years, 24% were within the age group of 40-49 years, 14.4% were within the age group of 50-59 years and 9.6% were ≥60 years. About 52% of the patients were male and 48% were female.



**Figure 1: Distribution of the respondents by sex**

**Table 2: Distribution of the respondents by occupation**

Occupation	N=250	%
Housewife	30	12
Service holder	75	30
Business person	50	20
Student	80	32
Day labour	12	4.8
Other	3	1.2

Regarding occupation 12% of the respondents were housewife, 30% were service holder, 20% were

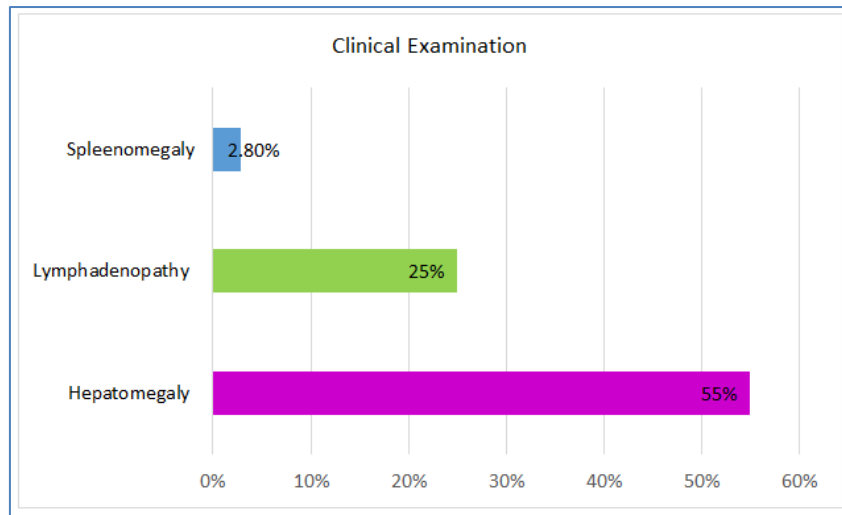
business person, 32% were student, 4.8% were day labour and 1.2 were from others occupation.

**Table 3: Symptoms and Clinical Findings of the Respondents**

Chief complaints	N=250	%
Fever	250	100
Generalized weakness	50	20
Headache	38	15.2
Cough and cold	40	16
Body ache	60	24
Vomiting	20	8
Abdominal Pain	20	8
Per nasal watery discharge	10	4
Rash	90	36
Nausea	40	16
Anorexia	60	24
Others	10	4

100% of the respondents had fever, 20% had generalized weakness, 15.2% had headache, 16% had cough and cold, 24% had body ache, 8% had vomiting and abdominal pain respectively, 4% had per nasal

watery discharge, 36% had rash, 16% had nausea, 24% had anorexia and 4% had other symptoms. Regarding Clinical Examination 55% had hepatomegaly, 25% had lymphadenopathy and 2.80% had splenomegaly.



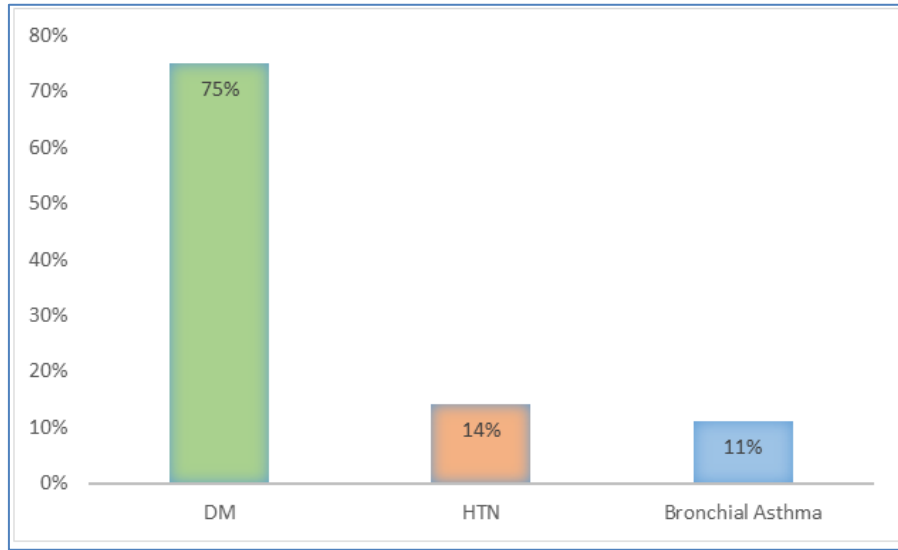
**Figure 2: Distribution of the patients by clinical examination (n=90)**

**Table 4: Past significant history of the respondents**

Past Medical History	n=40	%
Enteric fever	28	70
UTI	4	40
RTI	5	12.5
Travel history & hiking	3	7.5

Among all the respondents 40 patients had past significant history. Among them 70% had enteric fever, 40% had UTI, 12.5% had RTI and 7.5% had history of

travelling and hiking. About 25 respondents had comorbidity. Among them 75% had DM, 14% had HTN and 11% had bronchial asthma.



**Figure 3: Comorbidities of the Respondents (n=25)**

**Table 5: Investigation Done on the Respondents.**

Investigations	N=100	%
CBC & ESR	100	100
Weil Felix test	100	100
Urine R/M/E	68	68
Serum creatinine	18	18
USG of W/A	15	15
CRP	18	18
PBF	7	7
Urine C/S	10	10
S. Electrolytes	4	4

CBC & ESR and Weil Felix test were the most common (100%) investigation among the patients, Urine R/M/E in 68%, serum creatinine in 18%, USG of W/A in

15%, CRP in 18%, PBF in 7, Urine C/S in 10%, S. Electrolytes in 4% cases.

**Table 6: Treatment Given to the Respondents**

Treatment	N=90	%
Doxycycline	90	100
Paracetamol	90	100
Esomeprazole	90	100
Linagliptin+Metformin	20	22.22
Glimipiride	19	21.11
Azithromycin	18	20
Domperidon	10	11.11
Montelukast	9	10
Pantoprazole	8	8.89
Rupatadine	7	7.77
Ondansetron	6	6.67
Tiemonium	5	5.57
Fexofenadin	4	4.44
Others	40	44.44

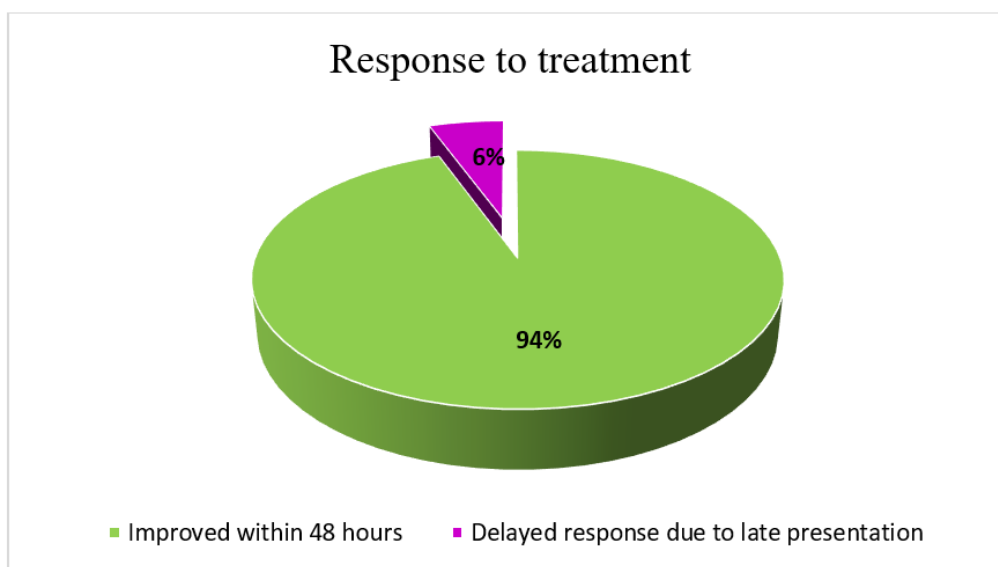
Table 6 shows the treatment given to the respondents. We found 90 Rickettsial Infection positive

patients. Doxycycline and Paracetamol and Esomeprazole were prescribed to all patients 90(100%)

and followed by Linagliptin+Metformin to 20(22.22%), Glimipiride to 19(21.11%), Azithromycin to 18(20%) and Domperidon to 10(1.11%), Montelukast 9 (10%), Pantoprazole to 8(8.89%), Rupatadine to 7(7.77%), Ondansetron to 6(6.67%), Tiemonium to 5 5.57%), Fexofenadin to 4(4.44%) and other treatment along with

the prescribed medicines was given to 40(44.44%) patients.

Authors studied the response of Doxycycline which showed 85(94.44%) cases improved within 48 hours of start of treatment. Remaining 5(5.55%) cases showed delayed response due to late presentation.



**Figure 4: Distribution of the respondents by response to treatment**

## DISCUSSION

According to many research, rickettsial infections are currently a major global health issue. The severity of rickettsial diseases can range from minor, self-limiting conditions to fulminating infections that are life-threatening [2- 14]. However, rickettsial diseases appear to be underdiagnosed the majority of the time due to the overwhelming bacterial, viral, and parasite infestations [14, 15].

In this study, the mean age of the patients was  $39 \pm 1.9$ . 8% of the patients had  $\leq 18$  years of age. 16% were within the age group of 19-29 years, 28% were within the age group of 30-39 years, 24% were within the age group of 40- 49 years, 14.4% were within the age group of 50-59 years and 9.6% were  $\geq 60$  years. About 52% of the patients were male and 48% were female. According to Sivasankari S *et al.*, 's study, the majority of patients were male between the ages of 30 and 45 [16]. Tabeen Mansoor *et al.*, in their study found 61.6% male and 38.4% female [17]. In this current study, 100% of the respondents had fever, 20% had generalized weakness, 15.2% had headache, 16% had cough and cold, 24% had body ache, 8% had vomiting and abdominal pain respectively, 4% had per nasal watery discharge, 36% had rash, 16% had nausea, 24% had anorexia and 4% had other symptoms. Regarding Clinical Examination 55% had hepatomegaly, 25% had lymphadenopathy and 2.80% had splenomegaly. Other research have reported the most prevalent clinical symptoms in our study (fever, headache, nausea, and

vomiting) [18]. In our study Among all the respondents 40 patients had past significant history. Among them 70% had enteric fever, 40% had UTI, 12.5% had RTI and 7.5% had history of travelling and hiking. About 25 respondents had co-morbidity. Among them 75% had DM, 14% had HTN and 11% had bronchial asthma. CBC & ESR and Weil Felix test were the most common (100%) investigation among the patients, Urine R/M/E in 68%, serum creatinine in 18%, USG of W/A in 15%, CRP in 18%, PBF in 7, Urine C/S in 10%, S. Electrolytes in 4% cases. Serologic testing is used to identify Rickettsia fever. Although the confirmatory tests are the rickettsial DNA-PCR and immunofluorescence assay, because of their unavailability and high cost in a country with limited resources like Bangladesh, the Weil Felix test is a less expensive substitute [19]. In our study, we found 90 Rickettsial Infection positive patients. Doxycycline and Paracetamol and Eesomeprazole were prescribed to all patients 90(100%) and followed by Linagliptin+Metformin to 20(22.22%), Glimipiride to 19(21.11%), Azithromycin to 18( 20%) and Domperidon to 10(1.11%), Montelukast 9 (10%), Pantoprazole to 8(8.89%), Rupatadine to 7(7.77%), Ondansetron to 6(6.67%), Tiemonium to 5 5.57%), Fexofenadin to 4(4.44%) and other treatment along with the prescribed medicines was given to 40(44.44%) patients. 23 patients were reported by Lokida *et al.*, to have taken antibiotics before being admitted to the hospital, including amoxicillin 8, cephadroxil 4, cotrimoxazole 3, chloramphenicol 2, cefixime 1, spiramycin 1, and a combination of medicines 4. 84% of patients received

antibiotic prescriptions following thorough investigation. Ceftriaxone 17, ciprofloxacin 9, and levofloxacin 9, as well as a combination of antibiotics and other treatments pertinent to their condition, were prescribed to the majority of the patients. This current revealed that, the response of Doxycycline which showed 85(94.44%) cases improved within 48 hours of start of treatment. Remaining 5(5.55%) cases showed delayed response due to late presentation.

## CONCLUSION

Rickettsial illness is inextricably linked to the sociocultural life of the majority of metropolitan residents. However, a lack of medical facilities and qualified doctors makes it challenging to identify rickettsial disease in febrile patients. It's important to make an early diagnosis when treating rickettsial illness. The investigations with the best success rates were the CBC, ESR, and Weil Felix test. Therefore, this study highlighted how crucial it is to consider rickettsioses when making a differential diagnosis of fever in hospitalised patients.

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