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Environment risk factor influencing Scrub Typhus in Kushinagar (Uttar Pradesh)

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ABSTRACT

Scrub typhus is an acute febrile widespread disease in Asia & Pacific islands which causes unspecific symptoms & signs. This is one of the biggest diseases in our country especially in the terai region and South India for many years. Scrub typhus, a dreaded disease in the pre-antibiotic era, is an important military disease which caused thousands of cases in the Far East during World War. It is a zoonosis and is a widespread disease in Asia and the Pacific Islands. Scrub typhus is an acute febrile illness which generally causes non-specific symptoms and signs. The clinical manifestations of this disease. Deaths are attributable to late presentation, delayed diagnosis, and drug resistance. The public health importance of this disease is underestimated because of difficulties with a clinical diagnosis and lack of laboratory methods in many geographical areas. Scrub typhus is known to occur all over India and physicians should be aware of this potentially serious but easily treatable disease. The aforesaid environmental factors affect the incidence and cause of Scrub typhus drastically as there is a high need to control this disease. So, a survey was conducted regarding this aspect.

Keywords— *Scrub Typhus, Febrile illness, Zoonosis*

1. INTRODUCTION

Scrub typhus was a dreaded disease in the pre-antibiotic era with case fatality rates Reaching 50%. It is an important military disease which caused thousands of cases in the Far East during the Second World War. The public health importance of this Disease is underestimated because of difficulties with a clinical diagnosis and lack of Laboratory methods in many geographical areas. The name "scrub typhus", which was coined by Fletcher in 1927 to stress the association of the disease with wasteland, was easy to pronounce and carried some meaning in English. The name gained widespread usage during World War II when military forces operating in the Asiatic/Pacific region encountered outbreaks of the disease which they associated with exposure to a "scrub" environment. The name "typhus" is derived from the Greek word typhus which means stupor. Savoor and Audy gave their introduction to the Chapter on Typhus in the Jubilee volume, The Institute for Medical Research 1900-1950, stated, "this is a doubly appropriate name, for not only is stupor a striking and characteristic feature of the intoxication of both typhus and the typhoid or enteric fevers, but the Greek word typhus also means smoke or haze – and until fairlyrecent times the complex of diseases related to typhus was but darkly seen through the smoky clouds of our ignorance".

An estimated one million cases occur annually and as many as one billion people living in endemic areas may have been infected at some time. Scrub typhus is an acute febrile illness widely distributed in the eastern hemisphere, especially in south-eastern Asia. It accounts for up to 23% of all febrile episodes in areas of the Asia-Pacific region where scrub typhus is endemic and has a mortality rate of up to 35% if it is left untreated. The numerous synonyms for scrub typhus include tsutsugamushi (disease mite) disease; Kedani (hairy mite) fever; akamushi (red mite) fever; flood fever; Japanese river fever; tropical typhus; rural typhus; mite-borne typhus and chigger-borne disease. The causative agent of scrub typhus Oriental tsutsugamushi is transmitted to humans by the bite of the larval stage of trombiculid mites, acarians belonging to the genus Leptotrombidium. The proliferation of the bacterium occurs at the site, forming a characteristic skin lesion known as an eschar. After incubation for 10-12 days, the affected persons experience headaches, fever, anorexia, and general lymphadenopathy. Additional symptoms include enlargement of the spleen, nervous disturbance, delirium, and prostration. Mortality ranges from 6 to 10%.

Death occurs as a direct result of the disease or from secondary effects such as pneumonia, encephalitis, and circulatory failure. Failure to suppress the rickettsia infection is manifested as a symptomatic infection or rickettsia. Disease severity and manifestations vary widely from asymptomatic to fatal and show marked geographical differences. The general course of the disease and the prognosis vary considerably depending on the character of the endemic strain. Primarily, the antigenic diversity of the three prototype strains, Gilliam, Karp and Kato were illustrated from New Guinea, Japan and Burma respectively.

Later on, more than thirty antigenically distinct serotypes are present in the endemic areas of the 'tsutsugamushi triangle'. In the wild, trombiculid mite larva can be found at any location that is suitable for rodent populations and has ground moisture sufficient to nourish the mite vectors. Presently, people living in urban areas are increasingly at risk of acquiring an O. tsutsugamushi infection that is antigenically similar to those that cause scrub typhus in rural populations. The reason for the change in the incidence of new cases is not clear. Scrub typhus is usually successfully treated with doxycycline, tetracycline or chloramphenicol. Currently, no effective and acceptable vaccine for human use against the rickettsia disease is available. Scrub typhus often presents as fever and cannot be distinguished clinically from co-endemic diseases such as malaria, typhoid, leptospirosis and dengue. The presence of eschar supports the diagnosis but this is often missed. Diagnosis, therefore, depends on clinical suspicion, promoting the clinician to request to an appropriate laboratory investigation, and failure to diagnose the disease will likely result in treatment with ineffective β-lactam drugs.

2. MATERIAL AND METHODS

2.1 Sources of data

- Data will be collected from Baba Raghav Das Medical College Gorakhpur
- Data will be collected from CDH Kushinagar

2.2 Work plan

After obtaining permission from the concerned authorities and informed consent from the samples, I will collect the data pertaining to the demographic variables using a structured interview schedule in the following three phases.

- **Phase I**: Pretest will be given to the patient to assess the existing knowledge regarding rickettsial fever with the help ofa structured questionnaire.
- **Phase II**: Structured teaching programme on rickettsial fever will be given toa patient with the help of flash cards on the same day for about 45 minutes of duration.
- **Phase III**: After a period of 7 days, post-test level of knowledge will be assessed by using the same questionnaire within the same group. Duration of data collection is 4 -6 weeks.

2.3 Scope of the investigation

The structured teaching programmer will improve the knowledge patient on rickettsial fever; this will enable the patient in understanding the differential diagnosis of rickettsial fever with other febrile conditions and provide care accordingly.

Table 1: Data on the epidemiology of scrub typhus from fever studies (hospital-based incidence)

First Author	Country, Region	Year	Patients with scrub typhus	Total patients in the study
CDH Kushinagar	U.P	2018	101	64
BRD Medical college GKP	U.P	2018	84	64

3. RESULT AND DISCUSSION

The result of Acute Encephalitis Syndrome is relating to scrub typhus along with a total number of cases with respect to environmental and socioeconomic factors. The average temperature, relative humidity, and rainfall is considered with reference to age group, month and relating a number of cases from January 2018 to December 2018. Seasonal patterns in reported encephalitis cases of 2018 in kushinagar district**.**

Table 2: Monthly details of AES cases with environmental parameters

Month	Avg. Temp. (^{0}C)	Avg. atm pressure (mb)	Relatie humidity (%)	Total rainfall (mm)	Total AES case
JAN	19	1016.2	62	5.6	4
FAB	20	1015.3	55	0	7
MAR	22	1011.0	53	4.8	9
APR	30	1008.8	41	3.0	5
MAY	32	1005.4	46	18.5	7
JUN	31	0999.5	64	128.6	6
JUL	33	0998.4	74	480.1	12
AUG	32	1000.3	78	335	19
SEP	32	1006.5	68	138.2	10
OCT	32	1013.3	70	0.6	5
NOV	24	1016.2	60	0	10
DEC	18	1018.2	68	0	1

Table 3: Details of AES Cases and Scrub typhus cases respect to age group

Age group	No of scrub typhus cases	Total AES cases
18-Jan	17	70
18-30	1	3
30-50	2	4
<50	0	4
TOTAL	**20**	**81**

Environmental factors included the effect of temperature, humidity and rainfall were as socioeconomic factors included gender, nature of the house, the floor of the house, source of drinking water, scrub vegetation near the house, cattle's near house, the prevalence of rat and shrews, economic condition, sanitation, literate.

3.1 Socioeconomic factors

Scrub typhus has become a major public threat in Gorakhpur district of Uttar Pradesh due to its complexity and lack of any specific treatments, even there is no vaccine is available.

3.2 Environmental factors

An important factor of environment i.e. temperature influence the health of any person. In my study, this factor played a very important role in categorizing and comparing the monthly variation of scrub typhus and AES cases.

3.3 Monthly variations in the AES cases and climatologic conditions

Combine analysis of the relative humidity, average temperature, and total monthly rainfall to the total number of the AES cases identified in the Gorakhpur signifies that the number of cases increases in monsoon season in high rainfall month July. August, September and October. Monsoon season is the favorable season for AES.

4. PROPER CONCLUSION REQUIRED

The scale runs from 0 to 6, running from perfect health without symptoms to death. Rankin scale is as follows:

(a) No symptoms.
(b) No significant disability, able to carry out all usual activities, despite some symptoms.

(c) Mild disability, able to look after own affairs without assistance, but unable to carry out all previous activities.
(d) Moderate disabilit requires some help, but able to walk unassisted.
(e) Moderately severe disability, unable to attend to own bodily needs without assistance, and unable to walk unassisted,
(f) Severe disability requires constant nursing care and attention, bedridden, incontinent.
(g) Dead.

5. CONCLUSION

The patients of almost all the age groups suffered from disease. The average age was 37.5 years. Almost half of the patients (49%) were between 15 and 30 years of age, suggesting the disease has a higher incidence in the younger population. A maximum number of patients came during the month of August-October, suggesting the seasonal occurrence of the disease. The most common presenting symptoms of AES patients were fever and altered sensorium followed by vomiting, headache, and seizures. The most common finding of a general examination of AES patients was pyrexia followed by tachycardia and pallor. Most of the patients presented with signs of meningeal irritation and raised intracranial tension. In 118 (59%) patients, etiology of AES could not be ascertained. Out of known agents, JE was most common in 40 (20%) patients followed by EV encephalitis in 14 (7%) patients than tubercular meningitis, septic meningitis, cerebral malaria, HSV encephalitis, and dengue virus encephalitis. On univariate correlation, the presence of seizure, low GCS, high TLC, aspiration pneumonia, the requirement of ventilator support and low platelet count was statistically significantly associated with poor outcome in AES Patients. On multivariate analysis, low GCS, high TLC, aspiration pneumonitis, and respiratory failure had a statistically significant correlation with poor outcome. In spite of the best of our effort and limited resources, etiologies of more than 50% AES cases could not be ascertained. Further research and analysis are required to analyze AES cases due to unknown agents. Out of known etiologies of AES, JE (vector borne), EV encephalitis (waterborne), and cerebral malaria (vector borne) are preventable. So, the burden of the disease could possibly be reduced by educating people and preventive measures. Aspiration pneumonitis (13%) was the most common complication in AES patients followed by respiratory failure (5%). As these complications may be prevented so early hospitalization, proper positioning, and general care of patients could possibly help in reducing morbidity and mortality. New strategies for pathogen identification and continued analysis of exposures and clinical features could help us improve our ability to diagnose, treat, and prevent AES.

6. REFERENCES

[1] Abrahamsen SK, Haugen CN, Rupali P, Mathai D, Langeland N, Eide GE, Morch K.
[2] Fever in the tropics: aetiology and case-fatality - a prospective observational study in a tertiary care hospital in South India. BMC Infect Dis 2013; 13:355.Allen AC, Spitz S. A Comparative study of the pathology of Scrub typhus (Tsutsugamushi disease) and other Rickettsial diseases. Am J Pathol 1945; 21(4):603-81.
[3] Alvarez-Elcoro S, Enzler MJ. The macrolides: erythromycin, clarithromycin, and azithromycin. Mayo Clin Proc 1999; 74(6):613-34.
[4] Amano K, Tamura A, Ohashi N, Urakami H, Kaya S, Fukushi K. Deficiency of peptidoglycan and lipopolysaccharide components in Rickettsia tsutsugamushi. Infect Immun 1987; 55(9):2290-2.
[5] Amano K, Hatakeyama H, Okuta M, Suto T, Mahara F. Serological studies of antigenic.
[6] The similarity between Japanese spotted fever rickettsiae and Weil-Felix test antigens.J Clin Microbiol 1992; 30(9):2441-6.
[7] Amano K, Suzuki N, Hatakeyama H, Kasahara Y, Fujii S, Fukushi K, Suto T, Mahara F.
[8] Amstey MS. Chloramphenicol therapy in pregnancy. Clin Infect Dis 2000; 30(1):237.

