ISSN: 0975-3583,0976-2833 VOL 17, ISSUE 6, 2026

A study of Scrub Encephalitis at tertiary care center at Jaipur

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ABSTRACT

Introduction- The CNS is the most important site of infection in patients with rickettsial diseases. Patients with scrub typhus have mild-to-moderate neurological manifestations. Meningitis and encephalitis are the most common neurological manifestations.

Aim -Study of clnicopathological and biochemical profile in scrub encephalitis.

Materials and Methods- Hospital based observational study conducted at Medicine department of Jaipur National University Institute for Medical Sciences and Research Centre, Jaipur from January 2024 to June 2025 on 50 patients of Scrub Encephalitis.

Results- In present study out of 50 patients 20 have seizures, neck rigidity was seen in 47 cases and Kernig sign was seen in 18 cases. Altered sensorium was seen in 62% of our patients. In present study most common MRI brain finding seen were Increased Signal intensity in various parts of brain and acute infarct.

Conclusion- Scrub Encephalitis is an important diagnosis to be made in any patient with altered sensorium, as it is eminently treatable. Clinical clues such as eschar, and

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investigations showing altered liver function tests and thrombocytopenia, may point to this diagnosis as shown in our study. Prompt therapy can be lifesaving, and hence, this is an important diagnosis to be made in tropical countries.

Keywords- Rickettsial diseases ,Scrub Encephalitis.

Introduction- Scrub typhus is a rickettsial infection caused by mite-borne bacterium belonging to the family Rickettsiaceae Orientia Tsutsugamushi .It is endemic in area of the world known as the "tsutsugamushi triangle" which extends from Japan to Australia, and to Pakistan and Afghanistan. The incidence of scrub typhus is increasing. It contributes to about fifty percent of the cases of acute undifferentiated febrile illness in various settings and is associated with high morbidity and mortality. Although the overall case fatality rate of patients admitted with scrub typhus infection is reported to be 9%, in those presenting with severe illness and requiring intensive care unit (ICU) admission, mortality may be as high as 24%.[1].

Scrub typhus involves the vascular endothelial cells, which induces many organ-system The main clinical features are high fever, rash, dysfunctions ,adenopathy, and eschar formation [2]. Few patients develop tremors, delirium, nervousness, or nuchal rigidity during the febrile stage [3] .

The CNS is the most important site of infection in patients with rickettsial diseases [4,]. The characteristic pathological CNS finding in patients with scrub typhus include a diffuse or focal mononuclear cell exudate in the leptomeninges and the presence of typhus nodules (clusters of microglial cells) which are distributed throughout the brain substance [6]. In patients with severe central nervous system involvement patients may present with neurologic dysfunction, including neck stiffness, neurologic weakness, seizures, delirium, and coma. Meningismus or meningitis has been detected in nearly 5.7%-13.5% of patients [7]

Traditional neuroimaging may show non-specific findings in scrub typhus meningoencephalitis. Phukan et al. in their study revealed alteration of subcortical white-matter

ISSN: 0975-3583,0976-2833 VOL 17, ISSUE 6, 2026

integrity in scrub typhus meningoencephalitis representing axonal degeneration and myelin breakdown [11]. Like TBM,CSF analysis in scrub typhus meningoencephalitis reveals lymphocytic pleocytosis which helps to differentiate from bacterial meningitis. CSF adenosine deaminase (ADA) of more than 10 U/L has a high sensitivity for tuberculous meningitis and may be used to differentiate the two diseases, though some studies have found CSF ADA in the same range in scrub typhus meningoencephalitis . [12]

Doxycycline for a minimum duration of five days or three afebrile days remains the standard treatment. Despite the early use of doxycycline in scrub typhus meningoencephalitis, mortality has been reported owing to its poor penetration of the blood-brain barrier, poor gastrointestinal absorption, antibiotic resistance, and immune-mediated damage [13]. Injectable doxycycline or azithromycin can be a good option in such situation [14].

Aim -Study of clnicopathological and biochemical profile in scrub encephalitis.

Materials and Methods- Hospital based observational study conducted at Medicine department of Jaipur National University Institute for Medical Sciences and Research Centre, Jaipur from January 2024 to June 2025 on 50 patients of Scrub Encephalitis.

INCLUSION CRITERIA

- Patient with AES proven to have scrub typhus with positive Scrub typhus detect IgM Elisa.
- Age> 18 year old patients.

EXCLUSION CRITERIA

- Patient in whom there was a definite proven cause such as pyogenic and tubercular meningitis,tumors,neurocysticercosis,fungal, epilepsy,or a definite metabolic/Structural cause.
- All other causes of tropical illnesses causing encephalitis were excluded by appropriate investigation.
- Patient not willing to give consent.

Methodology

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Study was done for a period from January 2023- June 2024 in SMS Medical College & Hospital Jaipur. Study includes a total of 50 patients of Scrub Encephalitis. Informed consent was taken from subjects and the study was approved by the institutional ethical and research committee. Scrub typhus Detect IgM ELISA (by InBIOS International) test was done to ascertain positive cases of Scrub typhus. A thorough history of their presenting complaints and associated co-morbidities were taken using a structured proforma. Details of patient examination, focusing on neurological evaluation (including assessment of Glasgow coma scale [GCS]), and other systems were also collected. Data regarding laboratory investigations done to ascertain the cause of febrile illness (malaria, dengue, etc.), complete blood count, renal and hepatic function tests, and cerebrospinal fluid (CSF) analysis were collected.

Results

Table-1 Demographic Parameters of patients

Parameter		No.	%
Sex	Female	30	60%
	Male	20	40%
	Total	50	100.0%
Residence	Rural	35	70%
	Urban	15	30%
	Total	50	100.0%
	Farmer	25	50%
	Labourer	10	20%
	Private sector Job	15	30%
	Total	50	100.0%

Table-2 Clinical Features of Patients

Fever	No	1	2%
	Yes	49	98%
	Total	50	100.0%
Headache	No	10	20.0%

	Yes	40	80.0%
	Total	50	100.0%
Nausea and Vomiting	**No**	24	48%
	Yes	26	52%
	Total	50	100.0%
Altered Sensorium	**No**	19	38%
	Yes	31	62%
	Total	50	100.0%
Seizures	**No**	30	60.0%
	Yes	20	40.0%
	Total	50	100.0%
Jaundice	**No**	37	74%
	Yes	13	26%
	Total	50	100.0%
Vasopressor requirement (Shock)	**No**	42	84%
	Yes	8	16%
	Total	50	100.0%
Splenomegaly	**No**	37	74%
	Yes	13	26%
	Total	50	100.0%
Eschar	**No**	42	84%
	Yes	8	16%
	Total	50	100.0%
Neck rigidity	**No**	3	6%
	Yes	47	94%
	Total	50	100.0%
Kernig's sign	**No**	32	64.0%
	Yes	18	36.0%
	Total	50	100.0%
Pleural effusion	**No**	44	88.0%
	Yes	6	12.0%
	Total	50	100.0%
Dyspnea	**No**	35	70.0%
	Yes	15	30.0%
	Total	50	100.0%
Pneumonitis	**No**	38	76.0%
	Yes	12	24.0%
	Total	50	100.0%
ARDS	**No**	44	94.0%
	Yes	6	6.0%
	Total	50	100.0%

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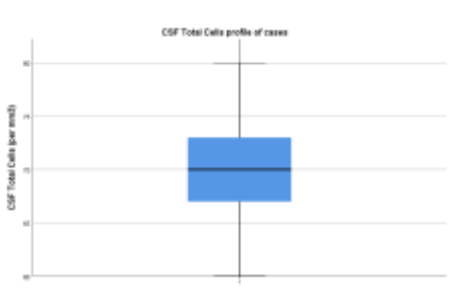
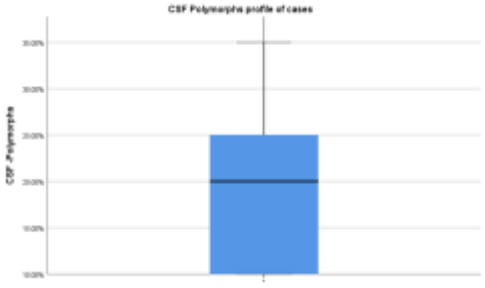
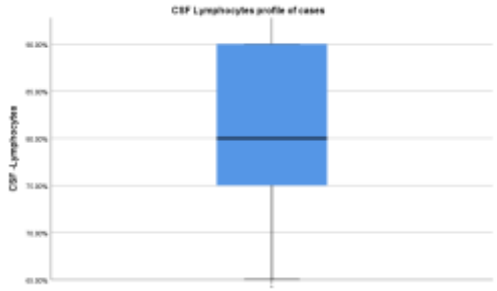
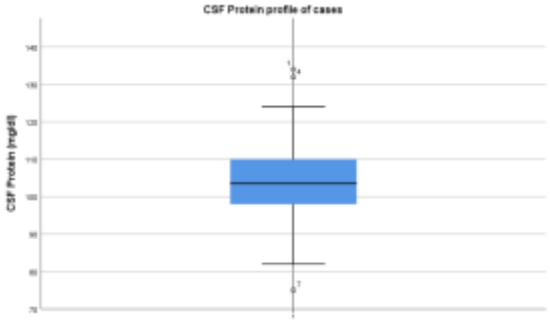
Table-3 CSF Profile of Patients

CSF Total Cells (per mm3)	69.57±4.80
CSF - Polymorphs	20.33±8.40
CSF - Lymphocytes	79.67±8.40
CSF Protein (mg/dl)	104.37±12.67
CSF Sugar (mg/dl)	54.60±7.99
CSF ADA (IU/L)	8.22±.98









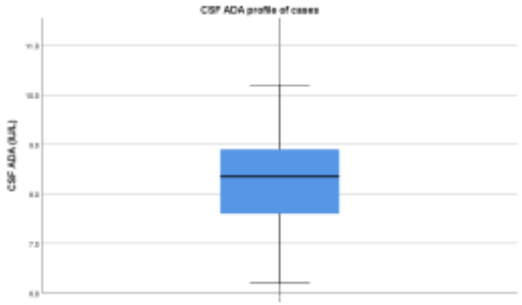


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Table-4: MRI Brain profile of the Cases

Parameter		No.	%
MRI Brain	Acute Haemorrhagic Infarct in left frontal region	3	6.0%
	Acute Haemorrhagic Infarct in right frontal region	3	6.0%
	Acute Infarct in Left MCA territory	3	6.0%
	Acute Infarct in Right MCA territory	3	6.0%
	Diffuse Cerebral Oedema	2	4.0%
	Focal 3 mm ring enhancing lesion in Corpus Callosum	3	6.0%
	Focal 4 mm ring enhancing lesion in Corpus Callosum	2	4.0%
	Hyperintense lesions in bilateral Subcortical white matter	3	6.0%
	Hyperintense lesions in Putamen and Thalamus	3	6.0%
	Increased Signal intensity in left Parietal white matter	3	6.0%
	Increased Signal intensity in left Parieto-occipital cortex	4	8.0%
	Increased Signal intensity in right Parietal white matter	3	6.0%
	Increased Signal intensity in right Parieto-occipital cortex	3	6.0%
	Microhaemorrhages in Corpus Callosum	3	6.0%
	Multiple areas of hyperintensity on T2 weighted images in periventricular and deep white matter	3	6.0%
	T2- weighted hyperintensity in brain stem	3	6.0%
	T2- weighted hyperintensity in cerebellar peduncles	3	6.0%
	Total	50	100.0%

Discussion-

In present study the clinical features seen in Scrub Encephalitis cases includes fever, Headache, nausea and vomiting, altered sensorium, Seizures, Jaundice and pain abdomen. In present study the prevalence of alter sensorium was 62% . In present study out of 50 patients 20 have seizures, neck rigidity was seen in 47 cases and Kernig sign was seen in 18 cases. Sukumar, et al.(2022) [69]in their study on SE found that altered sensorium was seen in 69% of the cases. Chen PH et al. in their study found that around 56% of Scrub encephalitis cases presented with altered sensorium.[7] This could be attributed to referral bias as our center is a tertiary hospital providing service to several adjacent districts as well.

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Interestingly, headache which is usually a common feature in SE was noted in 40 patients (80%).

In present study mean duration of illness is 11.37+2.86 days. There was an association between the duration of fever and altered sensorium. It means that the longer the duration of fever, more the occurrence of altered sensorium.

AES due to viral etiology is known to be a close provisional diagnosis for patients with SE. However, in viral AES, the fever and the altered sensorium occur together at presentation. In SE, the altered sensorium occurs after a period of febrile illness. This temporal association of fever and altered sensorium can give a clue to the diagnosis of SE in patients who present with fever and altered sensorium.[15]

It has been found that Scrub typhus involves the meninges more commonly, compared to other rickettsial infections. The overall CNS presentation in scrub typhus is ideally described as meningoencephalitis. However, studies have noted that patients without obvious signs of CNS involvement had reactive spinal fluid with mononuclear pleocytosis and their CSF tested positive for polymerase chain reaction for scrub typhus as well. This suggests that CNS invasion in scrub typhus is actually more common than what is suggested by associated CNS symptoms alone.[16]

In present study most common MRI brain finding seen were Increased Signal intensity in various parts of brain and acute infarct.

Conclusion- Scrub Encephalitis is an important diagnosis to be made in any patient with altered sensorium, as it is eminently treatable. Clinical clues such as eschar, and investigations showing altered liver function tests and thrombocytopenia, may point to this diagnosis as shown in our study. Prompt therapy can be lifesaving, and hence, this is an important diagnosis to be made in tropical countries.

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