

Motor aphasia in the first week of enteric fever

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Typhoid (enteric) fever is an endemic disease in many tropical countries, with diverse modes of presentation. The classic clinical manifestations are rarely seen nowadays owing to early diagnosis and institution of antibiotic therapy. Moreover, the epidemiology of the disease is constantly shifting, with some cases presenting with complications in the early part of the illness. Of all the complications reported in enteric fever, the neurological manifestations constitute an important but often under-diagnosed group. We report a 10-year-old girl with typhoid fever who presented with motor aphasia during the first week of illness, a complication that has not been reported previously.

Typhoid (enteric) fever has been known since antiquity, but its clinical significance in paediatrics was only recognised in India in the early 19th century¹. Enteric fever is caused by infection with *Salmonella typhi* and to a lesser extent *S. paratyphi* A, B and C. It represents a continuum of acute systemic febrile illness of protracted duration, mainly characterised by fever, bacteraemia, delirium, and a wide accompaniment of systemic manifestations. The typical clinical features may not be seen in all patients and the disease may instead manifest in an atypical form, of which neurological manifestations constitute an important but often under-diagnosed component. We report a case of enteric fever that presented with motor aphasia in the first week of illness.

Case report

A 10-year-old girl was brought to the paediatric emergency department of Jawaharlal Nehru Medical College and Hospital, Aligarh, India, with a history of fever for 4 days and inability to speak for 3 days. She complained of diffuse headache but had no history of any gastro-intestinal upset, vomiting, blurring of vision or diplopia. She was febrile (temperature 39.1°C) and looked ill, and examination revealed mild pallor, a coated tongue (Fig. 1) and splenomegaly (2.5 cm below the costal margin). No rose spots on the skin were noted. Her other vital signs were stable and she was not hypertensive. She had not received any prior treatment. Neurological examination showed her to be conscious and orientated, but she had bouts of irrelevant crying and emotional lability, indicating personality change. She had severe impairment with regard to naming and repetition of words, but her comprehension of spoken words was well preserved. No focal motor deficit was noted. All sensory, autonomic and cerebellar functions were intact.

Laboratory investigation showed a haemoglobin concentration of 8.4 g/dl, a white cell count of $6.9 \times 10^9/l$ with polymorphs 54%, lymphocytes 34% and eosinophils 10%, a platelet count of $45 \times 10^9/l$ and an erythrocyte sedimentation rate of 36 mm/1st h. Findings on cerebrospinal fluid studies and culture were normal, as were other biochemical parameters and a chest radiograph. Malaria and urinary tract infections were ruled out. Contrast-enhanced computed tomography (CT) of the head, performed



Fig. 1. Patient following commands and showing coated tongue.

because of the short history and sudden onset of symptoms, revealed infarction in both frontal lobes. Blood sent for culture on the day of admission showed growth of *S. typhi* sensitive to ceftriaxone. A Widal test on the same day was positive with a titre of 1:3 200 (O antigen).

Intravenous ceftriaxone was given for 14 days. Signs of clinical improvement were evident from day 4. The patient's fever subsided completely and her appetite improved, although motor aphasia persisted. Four weeks after discharge, she had recovered completely, with her speech back to normal.

Discussion

The manifestations of typhoid fever are often protean and a high index of suspicion is required for diagnosis, especially in endemic areas such as India. Neurological complications in enteric fever are not rare and range from 5% to 35% in various studies.² Of these complications, enteric encephalopathy is the most common (9.6 - 57%), followed by meningismus (5 - 17%).^{2,3} Other complications such as convulsions

(1.7 - 40%), spasticity (3.1%), focal neurological deficit (0.5%) and meningitis (0.2%) have also been reported.²⁻⁴

Other rare complications of typhoid fever, such as Parkinson's syndrome, motor neuron disease, transient amnesia, symmetrical sensory-motor neuropathy, schizophreniform psychosis and cerebellar involvement, have also been reported in various journals.⁵

Aphasia as a complication of enteric fever has been described in 2 - 7.4% of studies in an adult population³ but is very rare in the paediatric age group.⁵ Enteric fever presenting with motor aphasia during the first week of illness has not yet been reported.

The exact pathogenesis of these complications is not known. Suggested mechanisms include metabolic disturbances, hyperpyrexia, dehydration and electrolyte imbalance, toxemia and nonspecific cerebral changes in the form of oedema and haemorrhage.⁶ A cascade of pathological processes in the cerebrum leads to an acute diffuse encephalomyelitis, causing enteric fever encephalopathy.⁷

Aphasia occurs as a result of injury to the left cerebral hemisphere to a greater extent than the right. Language function localises to the left cerebral hemisphere in 96 - 99% of right-handed people and almost 60% of left-handed people. Of the remaining left-handed people, about half have mixed hemisphere language dominance, and the other half has right hemispherical dominance.

Motor aphasias are mostly due to stroke, head injury, cerebral tumours, infections, immune disorders, vasculitis or degenerative diseases of the frontal lobe. In enteric fever, typhoid neurotoxin-related injury in the speech area has been proposed as the most likely explanation for aphasia.⁴ Our patient had an acute onset of motor aphasia with a documented frontal lobe infarct on the CT scan, probably indicating that her neurological deficits were caused by vasculitis.

Few authors have reported that toxemia is the earliest and most common neurological complication in enteric fever, but it is often under-diagnosed. It can be considered to be an acute brain syndrome, associated with the height of pyrexia, and it clears quickly after treatment is started.⁵



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Only medical management with antibiotics, preferably after testing for microbial sensitivity, will help to alleviate the neurological complications of typhoid fever. Subjective and objective recovery from central nervous system involvement may be delayed for 6 - 8 weeks, but the recovery is usually complete, with no residual symptoms.

Conclusion

Motor aphasia is one of the unusual neurological presentations in enteric fever. Furthermore, in patients with motor aphasia and fever, the possibility of typhoid fever should be kept in mind in endemic areas.

Consent. Written informed consent was obtained from the patient's guardian for publication of this case report and accompanying image. A copy of the written consent is available from the authors.

Authors' contributions. MA and AA collected the data, and analysed and interpreted the literature and put together the case report, SA was involved in collecting pictures and reviewing articles, MA, AA and MS drafted and proof-read the manuscript, and MA and MS gave final approval of the version to be published. All authors read and approved the final manuscript.

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