CASE REPORT

Landau-Kleffner syndrome: an uncommon dealt with case in Southeast Asia

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SUMMARY

An 11-year-old boy was admitted with fever followed by convulsions. He had developed aphasia subsequent to this illness. His birth history was unremarkable, and he had normal growth and development including of language, hearing and vision. His neurological examination was normal except for aphasia. Investigations including cerebrospinal fluid study and MRI were normal. However, EEG was abnormal and the boy was diagnosed as a case of Landau-Kleffner syndrome (LKS) and treated with sodium valproate, levetiracetam and steroids. He responded well to treatment and has been on follow-up for the last 4 months. We present this case of LKS to increase awareness about early diagnosis and to highlight the importance of appropriate management for a better outcome.

BACKGROUND

Landau-Kleffner syndrome (LKS) is a relatively rare syndrome. It occurs in previously well children with normal language skills and development. It is characterised by epileptic seizures, aphasia and characteristic EEG abnormalities.¹ Maximum incidence is seen between 3 and 7 years of age with a 2:1 male predominance;² a little over 200 cases have been reported so far.³ The exact aetiology is not known though a genetic predisposition has been postulated.^{1–4} Some other conditions linked with LKS include neurocysticercosis,^{5–6} progressive encephalitis,⁷ acute disseminated encephalomyelitis,⁸ toxoplasmosis⁹ and temporal lobe tumours.¹⁰ Our case had characteristic features of LKS and was treated accordingly. We report this case to increase awareness in view of the rarity of this condition and the good response achieved with appropriate management.

CASE PRESENTATION

An 11-year-old boy was admitted elsewhere with a 3-day history of fever, not associated with any other symptoms at onset. On the third day of illness, he developed generalised tonic-clonic seizures, which lasted for 10 min, followed by post-ictal drowsiness for an hour. His parents described him as acting stubborn and irritable, but he displayed no apparent violent behaviour. There was no family history of seizures; the boy's birth history was unremarkable and developmental milestones were normal. He had presented similar episodes of seizures repeatedly at the time of admission, requiring intensive care. He was treated with anticonvulsants and supportive care. He had

apparently recovered for 2 days but again developed seizures, this time, 7–10 episodes per day of left focal seizures involving the face. Each episode lasted about 5–10 min. These seizures were present for the next 10–12 days in spite of treatment with anticonvulsants. The boy was unable to understand or respond to verbal commands despite normal sensorium. This was followed by worsening difficulty in pronouncing words. He was referred to us on day 15 of his illness.

On admission to our hospital, the boy's vital data and anthropometry were normal. There was no facial dysmorphism. Neurological examination (including funduscopy) was unremarkable except for speech and language abnormality (inability to understand written and verbal language, unable to follow simple commands). His vision and hearing were normal.

INVESTIGATIONS

Basic investigations (complete blood count, serum electrolytes, calcium and blood glucose) and cerebrospinal fluid study were normal. MRI of the brain (figure 1) did not reveal any abnormality. EEG (figure 2) revealed bilaterally symmetrical and synchronous background activity with left temporal periodic lateralised epileptiform discharges.

DIFFERENTIAL DIAGNOSIS

Certain clinical conditions may mimic LKS and need to be excluded. Autism with regression is important, though its age of onset in <3 years, absence of verbal and non-verbal communication, and stereotyped, repetitive behaviour is typical.¹¹ Some children with epilepsy from static structural brain lesions involving the language cortex may have episodes of ictal aphasia or status epilepticus and become permanently aphasic.¹² Children with LKS may have hyperactivity and only mild auditory agnosia, and may mimic those with attention deficit hyperactivity disorder.¹³ Lennox-Gestaut syndrome has a poly-spike and wave burst of fast rhythmic activity with predominantly tonic seizures. The differential diagnosis also includes deafness, elective mutism and mental retardation.

TREATMENT

Treatment of this condition is challenging because of its fluctuating course, lag in improvement relative to EEG and response to seizures but not in aphasia. Moreover, in some children with LKS, EEG and clinical abnormalities may fluctuate and remit spontaneously after a few years.¹⁴ The seizures may respond to a combination of

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Figure 1 T2-weighted MRI of the brain—normal.

anticonvulsants including valproic acid, clobazam, clonazepam, vigabatrin and felbamate.^{15 16} A valproate with benzodiazepine combination is most commonly used, though this only acts well in those having clinical seizures.¹⁷ Adrenocorticotrophic hormone (ACTH) and corticosteroids have shown some promise, especially when started early in the course, but seizure and aphasia may relapse when these are tapered.¹⁸ Intravenous immunoglobulin (IVIG) has been found to be useful in some patients.¹⁹ In those who fail to respond to medical treatment, multiple subpial resection is the surgery of choice.²⁰ Receptive language has improved in some patients following surgery, especially those having a shorter duration of language impairment prior to the surgery.²¹ The older the child is at LKS onset, the better the prognosis for salvaging language skills.²²

Our patient was treated with valproic acid and oral steroids, after which he showed improvement. The frequency of seizures had come down and his language function had improved significantly.

OUTCOME AND FOLLOW-UP

Our patient has been on follow-up for the last 4 months and has shown improvement in language function and control of seizures.

DISCUSSION

Children with LKS present with various types of clinical seizures, abnormal EEG and aphasia. The seizures may be Generalised Tonic Clonic seizures (GCTS), simple or complex partial seizures, or there may be an atypical absence of seizures.²³ The child in our case initially had GTCS, followed by simple partial seizures involving the face. The diagnosis was missed elsewhere, probably because of seizures of different types and lack of awareness about this condition.

The aphasia in these children may begin with an inability to comprehend verbal sounds (auditory agnosia). The child does not respond to familiar sounds (familiar voice, bell, etc), a condition that progresses to decreased verbal output, possibly

Figure 2 EEG—left temporal periodic lateralised epileptiform discharges.

containing garbled speech, paraphasia and neologism. This language disturbance is believed to occur because of persistent electrical activity in the temporoparietal language area during a period of cortical synaptogenesis.¹ Most cases do have residual speech abnormalities, though in some cases, the aphasia has responded fairly well to anticonvulsants with ACTH.²⁴ In our case, the aphasia responded well to treatment, though further follow-up is needed.

Almost all cases have abnormal EEG predominantly involving the temporoparietal regions, but 30% may not have associated clinical seizures.²⁵ Bilateral independent temporal or temporoparietal spikes, bilateral 1–3 Hz slow wave maximally temporal activity, generalised sharp-wave or slow-wave discharges, and multifocal or unilateral spikes, are described.²⁶ These discharges are activated by sleep, especially non-rapid eye movement sleep, though it can be present in the awake state.¹⁴ These EEG abnormalities must be differentiated from epilepsy with continuous spike waves during slow-wave sleep (CSWS) and from benign childhood epilepsy with centrotemporal spikes (BECT). In CSWS, abnormal awake records are more common and seizures more severe than in LKS.²⁷ In BECT, family history of epilepsy is common, acquired aphasia is absent and EEG abnormalities are predominantly in frontal areas. Our patient had characteristic EEG abnormalities in the awake state.

Diagnosis of LKS is based on characteristic EEG abnormalities, with clinical seizures and acquired aphasia in children with previously normal language and developmental milestones. CT and MRI of the brain are usually normal. Single-photon emission CT (SPECT scan) may show decreased perfusion in the temporal lobe,²⁸ and positron emission tomography with ¹⁸F fluorodeoxyglucose PET (FDG-PET) shows abnormal glucose metabolism in cortical areas,²⁹ though these tests are not widely available.

Learning points

- Landau-Kleffner syndrome should be considered in the differential diagnosis in a child with epilepsy and aphasia.
- Follow-up is essential, as response to treatment varies.
- Patients tend to relapse during tapering of drugs, especially steroids.

Contributors NM and NSD were involved in paediatric care. SA was the associated resident in paediatric care. NM, NS and SA carried out the literature search and compiled the report.

Competing interests None declared.

Patient consent Obtained.

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