Tuberous sclerosis with head injury

Sir,

Tuberous sclerosis complex (TSC) is a dominantly inherited genetic disorder affecting multiple organs. It involves mutations[1] in chromosome 9 (i.e., 9Q34) and chromosome 16 (16P13.3) which encodes for protein hamartin and tuberin respectively. Both these proteins are involved in tumor suppression[2] and hence gross deletions in the encoding genes leads to loss or control of cell growth and division with a predisposition to form tumors.[3] In 50-70% of cases there is new onset mutation. We present a case of a 16-year-old male presenting with head injury following seizures that was diagnosed with tuberous sclerosis and managed conservatively in neurotrauma ICU.

A 16-year-old male presented to the neurotrauma department in JPNATC, AIIMS with head injury following seizures. The patient was a known case of epilepsy on anticonvulsants (carbamazepine 400 mg and clobazam 10 mg per day). The patient had multiple papular lesions on face which his father said appeared after a drug reaction at 5 years of age. On examination, at arrival the patient's GCS was E1V1M4 and with threatened airway and was intubated. The papules on his face had orange peel consistency and malar in distribution. He had atraumatic periungal fibroma. His CT scan showed subependymal calcified nodules protruding into the ventricles. He was diagnosed to have tuberous sclerosis on fulfillment of two major criteria.[4] As his CT scan showed no evidence of any collection of blood or fracture or contusion he was shifted intubated to neurotrauma ICU for further management.

A review of his history revealed a full-term home delivery from nonconsanguineous marriage with uneventful perinatal history. After the age of 5 years the patient started to develop generalized seizures for which he was started on multiple anticonvulsants. The patient had reaction to one of the drugs and developed eruptions on face. But this was the onset of adenoma sebaceum. In school he exhibited episodes of violent behavior for which his schooling was discontinued. His other investigation included a normal chest X-ray and ultrasound of the abdomen.

In the ICU the patient had multiple episodes of generalized tonic-clonic convulsions (GTCS) not responding to multiple anticonvulsants (carbamazepine, clobazam, phenytoin, and valproate) and diagnosed to be status epilepticus. The patient was finally treated with infusion of sodium thiopentone (loading of 100 mg followed by infusion of 3 mg/kg/h) and was sedated with midazolam (0.02 mg/kg/h) and fentanyl (0.5 μg/kg/h) and ventilated. Seizures were controlled as soon as the sodium thiopentone infusion was started. The infusion was stopped after 6 hours and the patient was monitored for any seizure activity. There was no seizure activity for 24 hours. The patient was shifted to oral anticonvulsants. Feeding was started via Ryle's tube and the process of weaning was started. But due to poor respiratory efforts he was ventilated for 4 more days before he could be weaned off. He became M6 and was extubated. He was discharged and advised for follow-up in neurotrauma OPD.

Tuberous sclerosis is a multisystem genetic disorder and the second most common neurocutaneous disease with no pathognomonic signs but rather diagnosed with a combination of major and minor criteria. The incidence is estimated to be 1:6000 live births with prevalence of 1:10,000 births. The most common cause of death in TSC is status epilepticus (as was present in our case) or bronchopneumonia followed by renal failure. The most common lesion associated with death is lymphangioleiomyomatosis (LAM) while the most common cause of morbidity is seizures. An early age of onset of seizures is associated with refractory seizures and decreased cognitive function. The manifestations of this disease varies with organ systems like adenoma sebaceum in skin, cysts in kidney, rhabdomyomas in heart, LAM in lungs and tubers in cerebral cortex, etc., The presentation may be both typical or atypical.[5,6]

After a review of literature we could not find any suitable article on head injury occurring in a tuberous sclerosis patient. In our case the relevant clinical problems were first precipitation of status epilepticus. Head injury exacerbates the frequency of seizure and worsens seizure control[7] and as in our case thiopentone infusion was needed to control seizures. The second was that even after control of seizures and stoppage of sedation the patient's ventilatory pattern did not improve until 4 days. With a normal CT and possibly a concussion with no signs of raised intracranial pressure, the depressed ventilation was difficult to explain. If the CNS lesions (e.g., subependymal nodules or cortical tubers) affected respiration at time of concussion needs further evaluation and studies. Third, this patient had prominent subependymal nodules with calcification

which can be a harbinger of subependymal giant cell astrocytoma (SEGA) or obstructive hydrocephalus. Hence the patient needed a close follow up with serial neuroimaging.[8]

The patient with preexisting tuberous sclerosis presenting with head injury should be aggressively treated for seizures especially those with history of early onset. A careful weaning should be attempted in view of prominent CNS lesions and a planned follow-up should be carried out to keep a watch on the progression of lesion and neurological health.

Ranadhir Mitra, Keshav Goyal, Vanitha Rajagopalan, Priyanka Gupta, Navdeep Sokhal

Department of Neuroanaesthesiology and Critical Care, Jai Prakash Narayan Apex Trauma Centre, All India Institute of Medical Sciences, New Delhi, India

Address for correspondence:
Dr. Keshav Goyal,
Department of Neuroanaesthesiology and Critical Care,
Jai Prakash Narayan Apex Trauma Centre,
All India Institute of Medical Sciences,
New Delhi, India.
E-mail: keshavgoyal@yahoo.co.in

REFERENCES

1. Yates JR. Tuberous Sclerosis. Eur J Hum Genet 2006;14:1065-73.
2. Jozwiak J. Hamartin and Tuberin: Working together for tumour suppression. Int J Cancer 2006;118:1-5.
3. Borkowska J, Schwartz RA, Kotulska K, Jozwiak S. Tuberous sclerosis complex: Tumors and tumorigenesis. Int J Dermatol 2011;50:13-20.
4. Roach ES, Sparagana SP. Diagnosis of tuberous sclerosis complex. J Child Neurol 2004;19:643-649.
5. Basaran M, Basaran A. Tuberous sclerosis complex (Bourneville's disease) mimicking eclampsia. Anatol J Obstet Gynecol 2012;1:4.
6. Satyamoorthy P. Acute presentation of tuberous sclerosis: Case report. Singapore Med J 1993;34:358-60.
7. Tai PC, Gross DW. Exacerbation of pre-existing epilepsy by mild head injury: A five patient series. Can J Neurol Sci 2004;31:394-7.
8. Lambrecht V, Van Goethem JW, Özsarlak O, Maes M, Parizel PM. Tuberous sclerosis and subependymal giant cell astrocytoma. JBR–BTR 2005;88:144-5.

Access this article online	
Quick Response Code:	Website: www.saudija.org
	DOI: 10.4103/1658-354X.109866