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STURGE -WEBER SYNDROME COMPLICATED BY TODD'S PALSY: A PEDIATRIC CASE REPORT

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ABSTRACT

Background: Sturge-Weber Syndrome (SWS) is a rare congenital neurocutaneous disorder characterized by facial capillary malformations, leptomeningeal angiomas, and neurological manifestations including seizures, hemiparesis, developmental delay, and cognitive impairment. Todd's palsy is a transient postictal neurological deficit that may mimic acute cerebrovascular events and can complicate the clinical course of patients with SWS. **Case Presentation:** A 4-year-old female child with a known history of Sturge-Weber Syndrome and recurrent focal seizures presented with decreased movement of the right upper and lower limbs. The patient had multiple previous hospital admissions for convulsive episodes and was receiving antiepileptic therapy including carbamazepine, clobazam, oxcarbazepine, and brivaracetam. Clinical examination revealed right-sided hemiparesis with preserved consciousness and intact cranial nerve function. Systemic examination was unremarkable. Laboratory investigations demonstrated moderate anemia (hemoglobin 8.2 g/dL), leukocytosis (17,070 cells/mm³), reactive thrombocytosis (5.37 lakh/mm³), and mild hyponatremia (130.2 mEq/L). Neuroimaging findings were consistent with Sturge-Weber Syndrome. Based on the temporal relationship to seizure activity and the absence of acute intracranial pathology, a diagnosis of Todd's palsy secondary to focal seizure in a child with SWS was considered. The patient received supportive care, optimization of antiepileptic therapy, nutritional management, and neurological rehabilitation. **Discussion:** Recurrent seizures in SWS may result in transient postictal neurological deficits such as Todd's palsy, posing diagnostic challenges due to their resemblance to stroke-like episodes. Early recognition is essential to avoid unnecessary interventions and facilitate appropriate management. Associated factors such as anemia, malnutrition, and electrolyte disturbances may further lower the seizure threshold and influence neurological outcomes. **Conclusion:** This case highlights the importance of considering Todd's palsy in children with Sturge-Weber Syndrome presenting with acute hemiparesis following seizure episodes. Prompt diagnosis, effective seizure control, correction of contributing metabolic abnormalities, and multidisciplinary management are crucial for improving clinical outcomes and quality of life in affected patients.

KEYWORDS: Sturge-Weber Syndrome, Todd's Palsy, Hemiparesis, Pediatric Neurology, Seizure Disorder, Neurocutaneous Syndrome, Postictal Paralysis.

INTRODUCTION

Sturge-Weber Syndrome (SWS) is a rare congenital neurocutaneous disorder characterized by facial capillary malformations, leptomeningeal angiomas, and ocular abnormalities. The condition occurs sporadically and is associated with somatic mutations in the *GNAQ* gene, resulting in abnormal vascular development involving the skin, brain, and eyes. The estimated incidence of SWS is approximately 1 in 20,000–50,000 live births, affecting both sexes equally without racial predilection.[1,2]

Neurological manifestations are among the most significant complications of SWS and commonly include seizures, hemiparesis, stroke-like episodes, developmental delay, and cognitive impairment. Seizures occur in nearly 75–90% of affected patients and often begin during infancy, contributing to progressive neurological dysfunction and reduced quality of life.[3,4] Recurrent seizures and chronic cerebral hypoperfusion caused by leptomeningeal vascular malformations may result in focal neurological deficits and cerebral atrophy over time.[5]

Todd's palsy, also known as postictal paralysis, is a transient neurological deficit that develops following a seizure episode and is characterized by temporary weakness or paralysis affecting one side of the body. Although generally self-limiting, Todd's palsy may mimic acute ischemic stroke and presents a diagnostic challenge, particularly in children with underlying neurological disorders such as SWS.[6] Early recognition of this condition is essential to avoid unnecessary investigations and facilitate appropriate management.

This case report describes a pediatric patient with known Sturge-Weber Syndrome who presented with recurrent seizures complicated by Todd's palsy. The report highlights the clinical presentation, diagnostic considerations, and multidisciplinary management of this uncommon neurological complication.

CASE PRESENTATION

A 4 years old female patient was bought to the Pediatric Ward of Karnataka Medical College and Research Institute (KMCRI), Hubballi, on 1st January 2026 with the parentral concern of movement complaints. The primary complaints included decreased movement of both right side upper and lower limb.

According to caregivers, the child had developed Sturge Weber Syndrome with seizure disorder at the age of 7 years and the child was given Syp. Carbamazepine to treat seizure. The fundoscopy was done which was normal, CT brain was done which showed S/O Sturge Weber Syndrome. The child had 2nd admission at the age of 10 months due to convulsions where Syp. Carbamazepine was prescribed and discharged. The child had 3rd admission due to similar complaints diagnosed as K/C/O Sturge Weber Syndrome with Focal Seizure discharged with Syp. Carbamazepine and Clobazepem after that child was followed up with neurologist opinion where child was adviced to start Syp. Briveracetum, Oxacarbazepine and Clobazam.

Developmental History

- There was no history of consanguineous marriage, and the antenatal, natal and immediate postnatal periods were uneventful, with no reported maternal infections, exposure to teratogens, or complications during delivery. The child was born full-term through an uncomplicated vaginal delivery with a normal birth weight and cried immediately after birth, indicating no perinatal hypoxic insult. The child was adopted by her aunty at 2 months.
- The child's immunization history is not known.

Parameter	Finding	Interpretation/ Explanation
Temperature	36.6°C	Within normal range; afebrile status suggests no ongoing systemic infection at presentation.
Pulse Rate	104 bpm	Normal for age; reflects stable cardiovascular status.
Respiratory Rate	32 cpm	Normal for age; reflects stable respiratory status.
SpO2 (Oxygen Saturation)	98%	Indicates adequate peripheral oxygenation; no respiratory distress
Weight	10Kg	Below excepted for a 4-years-old; points to under nutrition
Anthropometry	Moderate Acute Nutrition	Based on WHO growth charts; supports a diagnosis of nutritional compromise.
General Appearance	Alert, cooperative	Suggests preserved higher mental functions and stable systemic status
Lymphadenopathy	Absent	Absence of lymph node enlargement; no active infection or hematological malignancy suspected.
Nutritional Status	Calorie deficiency	Reinforces the need for nutritional intervention as part of multidisciplinary care.

Conclusion Based on General Examination and Clinical Observations

The general examination and clinical findings of this 4-year-old female child indicate that she is currently systemically stable but neurologically compromised. The child maintains normal vital parameters, including temperature, pulse, respiratory rate, and oxygen saturation, suggesting the absence of any acute infection or cardiorespiratory distress at the time of presentation. Her alert and cooperative behavior further reflects preserved consciousness and higher mental functioning, indicating that there is no immediate alteration in sensorium.

However, the most significant clinical concern is the presence of reduced movement on the right side of the body (hemiparesis) in a known case of Sturge-Weber Syndrome. This neurological deficit is consistent with the natural progression of the disease, where abnormal cerebral blood vessels lead to impaired blood flow, recurrent seizures, and progressive brain injury. Over time, these vascular abnormalities and repeated seizure activity can result in focal neurological deficits such as hemiparesis, which may be transient or permanent. Thus, the child's presenting complaint reflects an underlying worsening or complication of her neurological condition rather than an acute systemic illness.

Additionally, the child is found to be underweight with moderate acute malnutrition, indicating a chronic nutritional deficiency that may further impact her growth, immunity, and neurological recovery. The absence of lymphadenopathy and other systemic abnormalities supports the conclusion that there is no concurrent infectious or hematological disorder contributing to her condition.

In summary, the overall clinical picture is that of a hemodynamically stable child with Sturge-Weber Syndrome presenting with focal neurological deficit (right-sided hemiparesis) and associated moderate malnutrition, requiring comprehensive management focusing on neurological care, seizure control, rehabilitation, and nutritional support.

Systemic and Neurological Examination

System	Findings	Interpretation/Explanation
Cardiovascular System	Normal S1 and S2 heart sounds; no murmur	Indicates normal cardiac auscultation; no structural or functional abnormality
Respiratory System	B/L air entry positive; Normal Vesicular Breath Sounds	Normal lung fields; absence of wheeze or crepitations
Abdominal Examination	Soft, non-tender, no organomegaly	Suggests absence of hepatomegaly or other inta-abdominal pathology
Cranial Nerve Examination	CN I not assessed; CN II-XII intact	Normal cranial nerve function, excluding olfactory nerve which was not evaluated. Suggests preserved cognition and conscious; important baseline for neurological disorders.

Conclusion Based on Systemic and Neurological Examination

The systemic examination findings in this child suggest that there is no involvement of major organ systems outside the nervous system, indicating an overall stable internal physiological status. The cardiovascular examination reveals normal heart sounds without any murmurs, which signifies the absence of structural or functional cardiac abnormalities. Similarly, the respiratory system findings of bilateral equal air entry with normal vesicular breath sounds indicate healthy lung function, with no evidence of airway obstruction, infection, or parenchymal disease.

The abdominal examination being soft, non-tender, and without organomegaly further supports that there is no underlying gastrointestinal or hepatosplenic pathology, reinforcing that the child's presenting complaints are unlikely to be related to systemic illness.

Importantly, the cranial nerve examination shows that cranial nerves II to XII are intact, which indicates preserved brainstem function and normal functioning of the nerves responsible for vision, eye movements, facial sensation, hearing, swallowing, and speech. A normal cranial nerve examination generally **reflects** intact neural pathways and absence of focal lesions affecting these nerves, and it also helps in ruling out major intracranial pathology at the level of the brainstem. This finding suggests that despite the child's neurological condition, there **is** no cranial nerve deficit at present, and higher mental functions and consciousness are likely preserved.

In conclusion, the overall systemic examination indicates a clinically stable child with no cardiopulmonary or abdominal abnormalities and preserved cranial nerve function**,** thereby localizing the primary pathology to the central nervous system, consistent with the known neurological disorder rather than a multisystem involvement.

INVESTIGATION

Investigation	Finding	Clinical Interpretation in Sturge-Weber Syndrome with Todd's Palsy
Hemoglobin (Hb)	8.2 g/dL	Moderate anemia. May contribute to fatigue and reduced cerebral oxygen delivery, potentially exacerbating neurological symptoms and seizure susceptibility.
Total Leukocyte Count (TLC)	17,070 cells/mm³	Leukocytosis suggestive of an underlying infection, inflammatory response, or stress reaction following seizure episodes.
Packed Cell Volume (PCV)	26%	Reduced PCV, consistent with moderate anemia.
Platelets	5.37 lakh/mm³	Reactive thrombocytosis, commonly associated with anemia, infection, or inflammatory conditions.
Serum Urea	12.1 mg/dL	Normal renal function. No evidence of renal impairment contributing to neurological manifestations.
Serum Creatinine	0.2 mg/dL	Low creatinine is expected in pediatric patients due to lower muscle mass.
Sodium	130.2 mEq/L	Mild hyponatremia. Can lower the seizure threshold and may have contributed to seizure activity in this patient.
Potassium	4.1 mEq/L	Within normal limits.
Chloride	98.5 mEq/L	Within normal limits.
Calcium	9.8 mg/dL	Normal calcium level; hypocalcemia is not a contributing factor to seizures.
Magnesium	2.2 mg/dL	Normal magnesium level; unlikely to be involved in seizure precipitation.
Phosphorus	3.8 mg/dL	Normal phosphorus level.
Total Protein	6.8 g/dL	Within normal range, indicating preserved nutritional status.
Albumin	3.5 g/dL	Lower normal range; no significant hypoalbuminemia.
Total Bilirubin	0.2 mg/dL	Normal liver function.
Direct Bilirubin	0.1 mg/dL	Normal.
Indirect Bilirubin	0.1 mg/dL	Normal.
SGOT (AST)	36.8 U/L	Within normal limits.
SGPT (ALT)	21.7 U/L	Normal hepatic function.
ALP	171 U/L	Mild elevation may be physiological in children due to active bone growth.

DISCUSSION

Sturge-Weber Syndrome (SWS) is a rare neurocutaneous disorder commonly associated with seizures, hemiparesis, and developmental abnormalities. Recurrent seizures are among the most frequent neurological manifestations and may lead to transient postictal deficits such as Todd's palsy.

In the present case, a 4-year-old female child with known SWS presented with right-sided hemiparesis following seizure activity. The temporal association between seizures and weakness, along with preserved consciousness and intact cranial nerve function, supported the diagnosis of Todd's palsy. This condition can mimic acute stroke, making accurate clinical assessment essential.

The patient also had moderate anemia, mild hyponatremia, and malnutrition, which may have contributed to increased seizure susceptibility and affected neurological recovery. Management focused on optimizing antiepileptic therapy, supportive care, nutritional rehabilitation, and neurological follow-up.

This case highlights the importance of recognizing Todd's palsy as a reversible complication of seizures in children with SWS and emphasizes the need for prompt diagnosis and multidisciplinary management.

CONCLUSION

Sturge-Weber Syndrome is a rare neurocutaneous disorder frequently associated with refractory seizures and progressive neurological impairment. This case describes a pediatric patient with SWS who presented with acute right-sided hemiparesis secondary to Todd's palsy following recurrent focal seizures. The case highlights the importance of considering postictal neurological deficits in the differential diagnosis of sudden hemiparesis in children with SWS.

Early recognition of Todd's palsy is crucial to distinguish it from stroke-like episodes and other neurological emergencies. Comprehensive evaluation, effective seizure control, correction of associated metabolic abnormalities, nutritional rehabilitation, and multidisciplinary follow-up are essential components of management. This report underscores the need for long-term neurological surveillance and individualized therapeutic strategies to optimize clinical outcomes and quality of life in patients with Sturge-Weber Syndrome.

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