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Spontaneous Idiopathic Intraventricular Hemorrhage in a 14-Year-Old Female Presenting with Altered Sensorium: A Case Report

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Abstract

Spontaneous intraventricular hemorrhage (IVH) in children is an uncommon clinical entity and is usually secondary to identifiable causes such as vascular malformations, trauma, tumors, or coagulation disorders. Idiopathic IVH without an identifiable etiology is exceedingly rare in the pediatric population. We report the case of a 14-year-old female who presented with acute altered sensorium and rapidly progressed to respiratory failure requiring mechanical ventilation. Neuroimaging revealed intraventricular hemorrhage without parenchymal involvement. Extensive evaluation including vascular imaging, coagulation profile, and systemic workup failed to identify an underlying cause. The patient was managed with supportive care and neurocritical monitoring. After exclusion of secondary causes, a diagnosis of idiopathic spontaneous IVH was made. This case highlights the diagnostic challenges and the importance of comprehensive evaluation in pediatric spontaneous IVH.

Keywords: Intraventricular hemorrhage, idiopathic IVH, pediatric stroke, spontaneous intracranial hemorrhage, altered sensorium

Introduction

Intraventricular hemorrhage refers to bleeding into the ventricular system of the brain and is commonly associated with trauma, vascular malformations, aneurysms, tumors, or coagulation abnormalities. In neonates, IVH is frequently linked to prematurity and germinal matrix hemorrhage; however, in older children and adolescents it is rare.

Spontaneous IVH in the absence of identifiable structural or systemic pathology is extremely uncommon. The clinical presentation may include headache, vomiting, seizures, and altered level of consciousness depending on the volume of hemorrhage and development of hydrocephalus.

Early neuroimaging and etiological evaluation are crucial because many cases are secondary to treatable conditions such as arteriovenous malformations or aneurysms. When exhaustive investigations fail to reveal an underlying cause, the condition may be classified as idiopathic spontaneous IVH. We report a rare case of idiopathic intraventricular hemorrhage in an adolescent girl presenting with acute altered sensorium.

Case Presentation

A 14-year-old previously healthy female was brought to the emergency department with sudden onset altered sensorium preceded by severe headache and vomiting for several hours. There was no history of trauma, seizures, fever, toxin exposure, anticoagulant use, or prior neurological illness.

On arrival, the patient was drowsy with a Glasgow Coma Scale (GCS) score of 8/15 (E2V2M4). Vital signs revealed blood pressure of 118/72 mmHg, pulse rate of 96 beats/min, respiratory rate of 20/min, and oxygen saturation of 96% on room air. Pupils were equal and reactive to light. There were no focal

neurological deficits appreciated due to depressed sensorium.

During observation in the emergency department, the patient developed worsening consciousness and signs of respiratory compromise, necessitating endotracheal intubation and mechanical ventilation for airway protection.

Imaging Findings

An urgent non-contrast CT scan of the brain demonstrated acute intraventricular hemorrhage involving the lateral ventricles and third ventricle without evidence of intraparenchymal bleed or mass lesion. There was mild ventricular dilatation suggestive of early obstructive hydrocephalus.

Subsequent CT angiography and magnetic resonance angiography (MRA) did not reveal any aneurysm, arteriovenous malformation, or vascular anomaly.

Laboratory Evaluation

Comprehensive investigations were performed to identify potential etiologies:

Complete blood count – within normal limits

Coagulation profile (PT, INR, aPTT) – normal

Platelet count – normal

Liver and renal function tests – normal

Serum electrolytes – within normal range

Screening for vasculitis and autoimmune disorders – negative

Toxicology screening – negative

There was no evidence of hematological disorders, coagulopathy, infection, or systemic disease.

Clinical Course

The patient was managed in the intensive care unit with supportive care, neuroprotective measures, and close neurological monitoring. Mechanical ventilation was continued until improvement in neurological status. Serial neuroimaging showed gradual stabilization of the hemorrhage without expansion. DSA performed after 6 months revealed normal study.

After thorough exclusion of structural, vascular, traumatic, and hematologic causes, the diagnosis of idiopathic spontaneous intraventricular hemorrhage was established.

Discussion

Spontaneous intraventricular hemorrhage in adolescents is rare and usually secondary to identifiable pathology. The most common etiologies include:

1. Arteriovenous malformations
2. Intracranial aneurysms
3. Trauma
4. Brain tumors
5. Coagulation disorders
6. Hypertensive hemorrhage (rare in children)

Idiopathic IVH is considered a diagnosis of exclusion after comprehensive evaluation. The proposed mechanisms include rupture of small subependymal vessels, transient vascular anomalies, or occult microvascular malformations not detected on imaging.

Clinical presentation varies depending on the volume and location of bleeding but often includes headache, vomiting, altered consciousness, and signs of increased intracranial pressure. Rapid deterioration may necessitate airway protection and ventilatory support.

Neuroimaging plays a central role in diagnosis. Non-contrast CT remains the initial imaging modality of choice due to its high sensitivity for acute hemorrhage. CT angiography or MR angiography are essential to exclude vascular abnormalities.

Management is largely supportive and includes stabilization, control of intracranial pressure, treatment of hydrocephalus when present, and close neurological monitoring. Prognosis depends on the extent of hemorrhage and development of complications such as hydrocephalus or secondary brain injury.

This case underscores the importance of systematic evaluation to rule out secondary causes before labeling a case as idiopathic.

Conclusion

Idiopathic spontaneous intraventricular hemorrhage in adolescents is extremely rare and represents a diagnosis of exclusion. Prompt neuroimaging, comprehensive etiological workup, and aggressive supportive care are essential in the management of such cases. Reporting rare presentations contributes to better understanding of the clinical spectrum and outcomes of pediatric intraventricular hemorrhage.

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