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Case Report

Vanishing White Matter Disease: A Case Report and Review of Literature

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ABSTRACT

Vanishing white matter disease is an autosomal recessive hereditary condition of brain. It may have variable phenotypic presentations but is more frequently encountered in younger age group. It is characterized by progressive encephalopathy and episodic neurological decline with predominant feature of cerebellar ataxia. Initial symptoms are preceded by a history of minor trauma, infection or stress. We present here a classic case of vanishing white matter disease diagnosed on Magnetic Resonance Imaging, documented in a four-year-old girl who presented with gait disturbance and progressive neurological deficits following a fall from bike.

Keywords: Childhood Ataxia with Central Hypomyelination (CACH), Fluid-Attenuated Inversion Recovery (FLAIR), Hypomyelination, Leukoencephalopathies.

How to Cite This Article: *Ali S, Nadeem MS, Shabab A, Ali U. Vanishing White Matter Disease: A Case Report and Review of Literature. Pak Armed Forces Med J 2025; 75(2): 424-425. DOI: https://doi.org/10.51253/pafmj.v75i2.7991*

INTRODUCTION

Vanishing white matter disease (VWM) also named as Childhood ataxia with central hypomyelination (CACH) is a rare entity described for the first time in 1997. It is considered an autosomal recessive disease; however dominant forms have also been reported. It is typically associated with eIF2B gene mutation involved in protein synthesis.[1,2] Age of onset of the disorder and its clinical severity have an inverse relationship with the severity of presentation observed in younger patients.[3,4] The most common form has its onset between 2 to 6 years of age, with progress in disease finally culminating in demise within a few years. However, the pattern of disease progression demonstrates significant variation, with patients either succumbing to symptoms within one to five years of onset, or a slow chronic course.[6] The typical presentation is of progressive motor dysfunction with hallmark cerebellar ataxia along with mild mental deterioration and cognitive impairment. Epilepsy, though infrequent, but may also be observed.

CASE REPORT

A four-year-old girl presented to neurosurgery department with progressive gait disturbance following fall from bike. The child had normal motor and intellectual development prior to the accident. Initially, post traumatic neuropathy was suspected, however episodic progression of her symptoms in the form of severe imbalance and ataxia, along with new onset seizures suggested otherwise. Her neurophysician advised an MRI evaluation. MRI revealed bilateral symmetrical T2Wi white matter hyperintensities appearing hypointense on Fluid-Attenuated Inversion Recovery (FLAIR) with subsequent cavitation at places. There was involvement of corpus callosum with relative sparing of its outer rim. U fibers and internal capsule also appeared to have been spared bilaterally. The fore documented MRI features (Figure) and clinical presentation of progressive neurological deterioration following minor trauma with hallmark of cerebellar ataxia and cognitive impairment led to the diagnosis of Vanishing White Matter Disease.

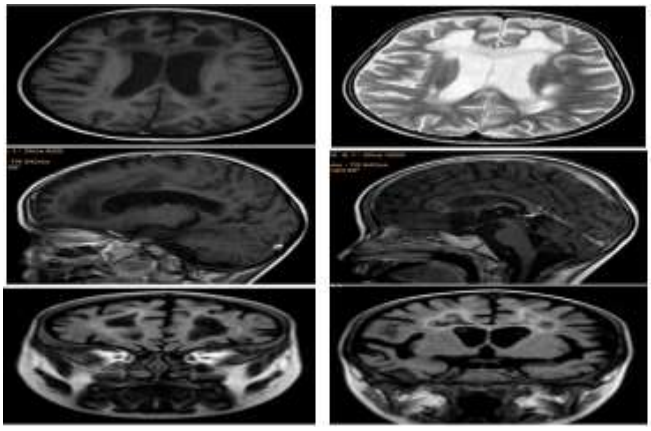

Figure: MRI features of the Patient

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Received: 07 Jan 2022; revision received: 15 Dec 2022; accepted: 30 Dec 2022

DISCUSSION

Vanishing White Matter disease also known as Childhood Ataxia with Central Hypomyelination (CACH) is an autosomal recessive disorder of cerebral white matter. It is also called 'Myelinopathia Centralis Diffusa' or an 'eIF2B-related disorder.' It is more common in younger patients with disease severity directly related to age of onset. Symptoms are therefore, more severe in younger patients. Four types have been described, with the classic form observed between 2 to 6 years of age. Patients present with acute onset neurological symptoms following head trauma, infection, stress or even fright. Cerebellar ataxia is hallmark with cognitive and motor impairment that worsens overtime, with aggravation following the fore-described triggers, eventually resulting in death. Along with white matter T2Wi and FLAIR hyperintensities with cavitation, Cerebellar vermis is also involved with variable atrophy.[7,8] Disease diagnosis is based on clinical findings, history and classic MRI features with MRI demonstrating significant sensitivity and specificity. Unfortunately no treatment is available for this condition. A diagnostic criterion has been established including clinical data, history and MRI features of disease, all of which should be present for the diagnosis to be established.[7,9]

Normal psychomotor development prior to disease onset. Onset of disease in childhood with episodic neurological deterioration and chronic progressive course. Disease progression however, has been observed to demonstrate marked variability. Neurologic signs including cerebellar ataxia, spasticity, epileptic attacks (infrequent) and optic atrophy (infrequent), disproportionate involvement of motor functions.[10] MRI is fundamental in diagnosis, demonstrating bilateral symmetrical white matter T2 and FLAIR hyperintensities similar to CSF with subsequent cavitation.

Conflict of Interest: None.

Funding Source: None.

Authors Contribution

Following authors have made substantial contributions to the manuscript as under:

SA & MSN: Conception, study design, drafting the manuscript, approval of the final version to be published.

AS & UA: Data acquisition, data analysis, data interpretation, critical review, approval of the final version to be published.

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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