Review and Advancements on Alice in Wonderland Syndrome (AIWS)

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***Abstract*—Alice in Wonderland Syndrome (AIWS), also known as Todd Syndrome or Dysmetropsia, is an uncommon neurological disorder involving distorted perceptions of body image, time, space, and external objects. AIWS subjects experience visual and somatosensory disturbances such as macropsia, micropsia, pelopsia, teleopsia, derealization, and depersonalization. The temporoparietal-occipital junction is predominantly affected, being the center for sensory integration AIWS is primarily associated with Epstein-Barr virus infection in children and migraine in adults, though secondary causes may include epilepsy, brain tumors, psychiatric disorders, head trauma, strokes, and drug effects. Diagnosis remains challenging due to the episodic nature of the disorder and lack of standardized criteria. Diagnosis depends on comprehensive clinical assessments, exclusion of alternative diagnoses, and supportive investigations. While no definitive therapy exists, targeting the underlying cause, symptomatic control through medications and behavioral changes, and psychological support can significantly reduce the impact on patients' lives.**

***Index Terms*—Metamorphopsia, Micropsia, Macropsia, Pelopsia, Teleopsia, Lilliputianism, Depersonalization, Derealization, Somatopsychic Duality, AIWS, AWS, Todd Syndrome, Pediatric ophthalmology, neuro-ophthalmic disease, pharmacology, sensory physiology, sensory pathology, socioeconomics and education in medicine and ophthalmology, strabismus.**

I. INTRODUCTION

The term "Alice in Wonderland syndrome" was given from the famous book "Alice's Adventures in Wonderland" by Lewis Carroll [8] . AIWS is a neurological disorder affecting perception of surroundings. Named after the literary classic by Lewis Carroll [8], AIWS causes objects and body parts to appear distorted in size and spatial relationship It is characterized by visual illusions such as micropsia and macropsia, and disturbances in time and body image. These episodes are often transient and can be reversible. Common etiologies include migraine [15]s, temporal lobe epilepsy, viral infections—most notably Epstein-Barr Virus, psychoactive drugs, and occasionally, brain tumors or psychiatric illnesses. The syndrome, though rare, may have chronic presentations and can be severely distressing due to its disorienting nature. AIWS is mostly associated with migraine [15]s, head trauma, or viral encephalitis caused by Epstein–Barr Virus [68] Infection. It is also theorized that Alice in wonderland syndrome can be caused by abnormal amounts of electrical activity, resulting in abnormal blood flow in the parts of the brain that process visual perception and texture. It is also possible to be experienced temporarily under the use of certain psychoactive drugs. AIWS occurs in both adolescents and adults, it is most commonly seen in children. It aims to analyze the characteristics of the global research landscape on AIWS. Alice in wonderland syndrome has been found to be associated with infection with pathogens such as Epstein Barr virus, migraine [15], depression, epilepsy, and delirium.

Causes:

Infections: Epstein-Barr Virus, Influenza A, etc

Migraines: Frequently seen as aura phenomena in adults.

Seizures: Associated with temporal lobe epilepsy.

Strokes: May affect brain areas responsible for perception.

Medications: E.g., topiramate, montelukast.

Brain Tumors: Can disrupt visual-sensory integration.

Head Trauma: Recognized as a trigger in some individuals.

Psychiatric Disorders: Rarely, schizophrenia or depression may manifest as AIWS.

Symptoms:

Self-Perception: Macrosomatognosia, microsomatognosia, derealization, depersonalization, somatopsychic duality.

Visual Perception: Micropsia, macropsia, pelopsia, teleopsia, porropsia, Lilliputianism, visual distortion.

Other Symptoms: Migraine, sound distortion, dizziness, nausea, mood swings.

II. DIAGNOSIS

Alice in wonderland syndrome lacks standardized diagnostic criteria in ICD-10 and DSM-5. Diagnosis is primarily clinical and it relies on detailed history, neurologic examination, and exclusion of alternative diagnoses. Investigations done for diagnosis are MRI, EEG, and viral antibody testing. Asking children to draw the illusions they see can aid diagnosis. Differentiation from psychosis is essential as AIWS patients typically retain insight. Misdiagnosis is common due to variability in presentation and absence of definitive markers. The most likely way a doctor will diagnose this condition is by asking questions about the symptoms you have. They will also perform a neurological exam to determine if you are having any issues with other types of brain function. They may also recommend certain types of diagnostic tests to look for other brain-related conditions some of which are serious that could cause AIWS symptoms.

III. TREATMENT AND CARE

Underlying Cause: Treatment of primary condition—e.g., migraine [15] prophylaxis, antiepileptics.

Symptom Management: Reassurance, CBT for psychological distress, lifestyle changes including sleep hygiene and stress reduction.

Medication: Antidepressants or anxiolytics if secondary to psychological factors.

Monitoring: Regular follow-up and neurological assessments.

Alternative Therapies: Some practitioners advocate homeopathy, although scientific support is limited.

Conclusion:

AIWS predominantly affects children, with micropsia and teleopsia being most common. Though viral infections are common causes, no trigger is identified in about half the cases. While many recover spontaneously, a significant number have persistent symptoms or later develop migraine [15] s. Since 1955 [9], fewer than 200 cases have been reported. Improved recognition, better classification, and standardized diagnostic protocols are urgently needed. Establishing a global registry and utilizing functional neuroimaging [16] could clarify AIWS pathophysiology and aid in tailored therapies.

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