

## Alice in Wonderland Syndrome:

### Is There a Genetic Origin?

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#### Abstract

We describe the case of a familial situation of Alice in Wonderland seizures in a 39 years-old mother and a 14-year-old son from Southampton, United Kingdom. To date, there are only few reports supporting the thesis, Alice in Wonderland Syndrome could be hereditary. Next generation sequencing could help to clear the genetics in AIWS.

**Keywords:** AIWS; Children; Genetic; Origin; Hereditary.

#### Introduction

##### Alice in Wonderland - Short summary of the story

The adventures of Alice in Wonderland became a world bestseller. The girl Alice sees a white rabbit who looks at a clock and says he will be late.

Alice follows him down the rabbit hole and arrives at a room full of doors. She finds a key that she uses to open the smallest door, but she can't fit through. Then she drinks a potion that makes her small enough, but the door is now closed. Finally, she does get into Wonderland, meets white rabbit, and grows into gigantic size. Then she becomes small again and runs into the forest, caterpillar

brings her back to her normal size. Alice comes to the Duchess and meets the Cheshire Cat, then she meets the March Hare and the Mad Hatter at a crazy tea party. She ends up with Queen of Hearts and the King of Hearts; the Queen of Hearts is dying to cut someone's head off. Alice plays croquet with animals and anthropomorphic playing cards; the racket is a flamingo, and the ball is a hedgehog. The

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Queen of Hearts sentences all but Alice to death, but the King of Hearts pardons her. A griffin leads Alice to the turtle-supperich, a mixture of kih and turtle. Then follows a trial in which the Jack of Hearts must justify himself for having stolen the Queen's pies. The Mad Hatter appears as a witness, as does Alice. However, she has now grown so big that she blows up the court. Before it continues, Alice wakes up next to her sister.

### **Case Report**

The mother contacted our department per email and described their chronological experiences with his son and Alice in Wonderland seizures in detail. In the mother, AIWS seizures occurred with age 9, the son with the age of 7 years. The son is a non-identical twin and had resuscitation after birth. Emotional traumas and common illnesses served as a trigger for seizure in the boy. Both families had distortion of time.

### **Personal description of a 39-year-old mother in detail**

"I am a 39-year-old, white British woman with 3 children and a history of perceptual disturbances, starting around age 9. My events always occurred at night, before falling asleep. It would always start with a sense of feeling very small and that everything was getting further and further away. Coupled with this was a sense that my arms and legs had grown incredibly long and thin, such that trying to move them would cause me great distress as they felt beyond my control. At the same time, I would hear a clock ticking (not sure whether it was real or imagined) but the

speed would be much too fast and loud; everything felt like it was running in fast forward. The noises were so loud that they felt physically intolerable.

The situation would then reverse itself and usually by this time, I would be pacing back and forth across my room, crying, and trying to make it stop. The "clock" would slow right down, and my limbs would shrink to the point where they felt like tiny, immovable stumps. Every object appeared too big and too close. I'd feel as if my mind and my body were stuck in treacle as everything was running too slowly. To this day, I find it very hard to listen to a clock which is ticking unnaturally fast (for example, in films). These episodes occurred several times over a number of years and would last for around half an hour (although that's difficult to assess, given the distortion in time). I don't ever remember there being a specific trigger, but I always felt aware of an oncoming event before it happened. I believe that they stopped around the age of 13 but I still have very mild events every so often. These mild episodes are difficult to describe. Like the ones in my childhood, they always happen when trying to sleep and I'm usually aware of the impending onset. They aren't distressing to me anymore and I find them more curious than anything. I feel as if my body is in motion but both ascending and descending at the same time. I have a medical history of gynecological issues, post-natal depression, heart problems (SVT), autonomic dysfunction and (probably most notably) migraines. My migraines first appeared around age 30 and present as ocular disturbances, usually without pain. I have no

history of drug use although I do use nicotine and drink moderate amounts of alcohol”

### **Son, 14 years-old**

“My son, Elliot, is nearly 14 years old and has suffered the same condition since around the age of 7. His attacks started when his father and I divorced which leads me to suspect that emotional trauma was a trigger for him. These days his main trigger is illness - a common cold or fever will almost always precipitate an event. In fact, he had one last night. His episodes are almost identical to mine in both manifestation and duration. He becomes very distressed and it's almost impossible to comfort him. He's conscious throughout and engages with me but he's unable to tolerate the volume of my voice, even as a whisper. When comforting him, I have to move extremely slowly as any movement appears much too fast and causes him distress. He, too, is aware of the onset and usually predicts an event about an hour in advance. Elliot has an unremarkable medical history but is a non-identical twin, born prematurely and spent 2 weeks in NICU after being resuscitated at birth. I would love to see more awareness and more understanding of AIWS. It is my hope that treatment can be developed as it can be a very distressing condition to deal with. I grew up believing that there was something wrong with me, mentally. I never told anyone as I thought I wouldn't be believed or, worse, I'd be thought of as crazy. Elliot's missing school today as he was awake during the night, dealing with an attack and is now still sleeping. I also have reservations about him receiving his offered covid vaccine as I'm

concerned that it could cause a mild fever, triggering an AIWS event”.

### **Discussion**

Alice in Wonderland Syndrome or Alice in Wonderland Syndrome (AIWS) refers to the narrative story Alice's Adventures in Wonderland by Oxford mathematician Charles Lutwidge Dodgson, published in 1865 under his authorial pseudonym Lewis Carroll [1]. The child protagonist Alice, bored and tired, falls into a room that leads her down a rabbit hole into a parallel world where the action of the narrative takes place. A central plot element of the adventures is the recurring changes in her body size, alternating between severe shrinkage and enormous growth [1,2]. In addition to the White Rabbit, whom Alice follows underground, she encounters a whole host of different and fantastic characters with whom she enters strange-seeming conversations and who allow her to participate in bizarre sporting and events. AIWS was first comprehensively described in 1955 by the British neurologist John Todd [1,2]. As early as 1952, the American neurologist Carol W. Lippman documented the symptoms, referring to a patient who described the condition herself as "wee-dledum or wee-dledee feeling." The term "Alice in Wonderland syndrome" was named after the children's book Alice in Wonderland by Lewis Carroll, and coined by John Todd as a possible, but not essential, concomitant of migraine and epilepsy [3-5]. Carroll suffered from migraine himself, and it is believed that his experiences with the condition served as

inspiration for the hallucination-like effects described in his work [6,7]. In addition, Carroll's narrative has been discussed as a description of a trip after consumption of mind-altering drugs. In one of the most famous sequences in the book, Alice changes size by biting off pieces from different sides of a mushroom. However, there is no evidence of drug use by Lewis Carroll. Alice in Wonderland syndrome results in changes in the perception of one's surroundings. These changes include both micropsia and macropsia (everything appears reduced or enlarged), as well as altered auditory perception, altered tactile perception, and altered sense of time. The syndrome is particularly common in children. Attacks are often shorter and may also be completely painless, although accompanying symptoms such as nausea, vomiting, and sensitivity to light and sound are more pronounced. Neurological deficits may occur, so that the

affected child begins to hallucinate. He or she perceives his or her body as larger or smaller and/or begins to see "fantastic images". The changes in perception can severely affect affected individuals, causing them to become disoriented and "unable to find their way around." In extreme cases, falls and other accidents may occur. The perceptual disturbances can lead to Alice in Wonderland syndrome being confused with other mental disorders or misinterpreted as "craziness". In conclusion, AIWS seems to be hereditary. In our case, two families show the same seizure patterns. We recommended the mother to contact a pediatric neurologist at Great Ormond Street in London to confirm our assumptions. Next generation sequencing to confirm a mutation or point mutation in finding the genetic origin of the disease, which makes such curious visual disturbances in the patients who suffer from.

## References

1. Lanska DJ, Lanska JR. The alice-in-wonderland syndrome. *Front Neurol Neurosci.* 2018;42:142-50. [PubMed](#) | [CrossRef](#)
2. Cau C. La sindrome di Alice nel paese delle meraviglie. *Minerva Med.* 1999;90:397-401. [PubMed](#)
3. Farooq O, Fine EJ. Alice in Wonderland syndrome: a historical and medical review. *Pediatr Neurol.* 2017;77:5-11. [PubMed](#) | [CrossRef](#)
4. Mastria G, Mancini V, Viganò A, Di Piero V. Alice in Wonderland syndrome: a clinical and pathophysiological review. *Biomed Res Int.* 2016;2016. [PubMed](#) | [CrossRef](#)
5. Hossain MM. Alice in Wonderland syndrome (AIWS): a research overview. *AIMS Neurosci.* 2020;7(4):389. [PubMed](#) | [CrossRef](#)
6. O'Toole P, Modestino EJ. Alice in Wonderland Syndrome: A real life version of Lewis Carroll's novel. *Brain Dev.* 2017;39(6):470-4. [PubMed](#) | [CrossRef](#)
7. Blom JD. The Alice in Wonderland syndrome. What do we know after 60 years? *Tijdschrift voor psychiatrie.* 2016;58(4):281-91. [PubMed](#)