

A Case Report on Cerebral Periventricular Leukomalacia and Schizophrenia

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ABSTRACT

This case is of a patient 24 years old male of Haitian-American origin, speaks English who is diagnosed with schizophrenia and cannabis use disorder. The patient had a premature delivery and the mother was not on any sort of medication during pregnancy. The first outbreak occurred in 2010 and was diagnosed with schizophrenia then. The patient is a drug addict and upon MRI cerebral leukomalacia was observed. There was no family history of such diseases and the symptoms of the patient were extremely self-damaging.

Keywords

Schizophrenia, Cerebral periventricular leukomalacia.

Introduction

This research is being conducted to find out the relationship between schizophrenia and cerebral periventricular leukomalacia. According to previous research, there have been a few instances where brain damage has been observed in cases of schizophrenia. This research is based on finding if there is any relationship in between the two diseases.

Case Presentation

The patient is a 24 year-old Haitian-American, English-speaking male diagnosed with schizophrenia and cannabis use disorder.

The patient was born in Brooklyn and raised by both parents along with an older brother and younger sister. The patient was born prematurely, weighing approximately 3lbs at birth. The Patient remained hospitalized for 1-2 weeks and discharged home. Mother denied use of medications or substances during pregnancy. No subsequent developmental delays and patient achieved all appropriate developmental milestones.

The first psychotic break occurred in 2010. The patient was using

drugs (unknown, suspect's marijuana). This led to behavioral changes (becoming withdrawn, isolated) and inpatient admission resulting in a diagnosis of schizophrenia.

The patient remained in regular classes for high school, given an IEP (Individualized Education Plan) for Regents exams due to difficulty concentrating. MRI performed 6/8/12 demonstrated cerebral periventricular leukomalacia. It is uncertain to what degree if, any, this impacted his presentation with psychiatric illness.

The patient was bullied for the large hemangioma on his neck. After his psychotic break, he attempted to remove it himself at home. It bled profusely, leading him to seek medical attention.

At baseline, the patient goes to the gym, skateboards, uses the computer, and makes different "inventions." Mother showed pictures of a "web-shooter" he created based on Spider-Man. When the patient becomes irritable, drinks a lot of coffee, draws dragons (recent obsession 2-3 months) tells her to "leave him alone", becomes isolated, he is declining and noncompliant with medication, which prompts hospitalization.

The patient had tongue protrusion with Risperdal, leaving him

fearful of taking medication.

The patient is unemployed, has attended some college, never-married, no children, and is not in a romantic relationship.

There is no family history of mental illness.

The patient states he practices “ninjitsu and other martial arts.” He soldered a small knife that is “part of his philosophy.” Since he saw real dragons in a Facebook video, it confirmed his philosophy. He went outside to show the blade and explain his philosophy, stating “I am a prophet.” This resulted in police being called, and inpatient hospitalization. Patient is non-compliant with medications since previous discharge and does not believe he has any psychiatric illness.

Discussion

Cerebral Periventricular leukomalacia is a type of brain injury that results in the death of brain tissue around the ventricles. It most commonly involves infants and is much more common in premature infants compared to mature full-term infants [1]. It is believed to be caused by changes in blood flow in the areas around the ventricles. Other causes include infection at the time of delivery. Premature babies having an intraventricular hemorrhage are at an increased risk of developing this condition. Most common symptom is spastic diplegia [2].

Schizophrenia is a disorder that disrupts the way a person thinks feels and acts. Patients have difficulty in distinguishing between reality and imagination. Such problems cause difficulty for patients to express themselves in normal social conditions. It is still not clear as to what causes schizophrenia, but it is believed to be because of genetics, abnormal brain structures or chemistry or possibly due to viral infections and immune disorders. Patients feel symptoms of delusions, hallucinations, disordered thinking, speech and behavior and motor function deficits [3].

Recently by new reports, it is found out that perinatal brain damage increased the risk of schizophrenia and hence it was proposed that “schizophrenia may be more common in the increasingly large number of babies who survive very preterm birth.” There have been reports of teenagers with schizophrenia with premature birth and cerebral periventricular leukomalacia [4]. Many structural changes have also been identified in schizophrenia. One such change is the involvement of the ventricles and the decrease in cerebral volume [5]. Cerebral periventricular leukomalacia causes cognitive and visual impairment, seizures and cerebral palsy, but with recent researches, it is shown the cerebral periventricular leukomalacia causes enlargement of the ventricles and damages many brain circuits. Enlargement of the ventricles due to cerebral periventricular leukomalacia is identified as the most common marker for schizophrenia. Other problems such as auditory hallucinations and somatic delusions are observed, especially in cerebral periventricular leukomalacia. Usually, the affected lobe is the medial temporal lobe in all schizophrenics, which differ in degree from each other, but are of the same kind [6]. The structures

present in the medial temporal lobe are believed to have an important role in the integration and processing of the output from the association cortex. If there is a problem with this region, then it usually leads to schizophrenia [7].

It has been commonly noted that patients suffering from schizophrenia and likely to have cerebral periventricular leukomalacia hence it is easy to believe that cerebral periventricular leukomalacia is, in fact, a cause of schizophrenia as it has been observed many times on magnetic resonance imaging [8]. However cerebral periventricular leukomalacia is not the only reason causing schizophrenia, such as genetic causes and abnormal brain development. There may still be many unknown causes of schizophrenia. In this case, the patient had a normal delivery and all developmental milestones were achieved on time, but the patient still developed schizophrenia [9]. Assuming by given history, the patient was involved in sports such as skateboarding and also martial arts such as Ninjitsu which may have resulted in hits to the head causing brain damage hence leading to cerebral periventricular leukomalacia that in turn led to schizophrenia but still causes remain unknown [10].

Conclusion

After research, it can be said that there is some relationship between cerebral periventricular leukomalacia and schizophrenia. Patients having schizophrenia are observed having schizophrenia, therefore, schizophrenia can be stated as a cause of cerebral periventricular leukomalacia or vice versa hence indicating a positive relationship between the two diseases.

References

1. Zaghoul N, Patel H, Ahmed MN. A model of Periventricular Leukomalacia (PVL) in neonate mice with histopathological and neurodevelopmental outcomes mimicking human PVL in neonates. *PLoS One*. 2017; 12: e0175438.
2. Marlow N, Wolke D, Bracewell MA, et al. EPICure Study Group. Neurologic and developmental disability at six years of age after extremely preterm birth. *N Engl J Med*. 2005; 352: 9-19.
3. Bernard JA, Goen JRM, Maldonado T. A case for motor network contributions to schizophrenia symptoms: Evidence from resting-state connectivity. *Hum Brain Mapp*. 2017; 12.
4. Gilmore JH, Castillo M, Rojas M. Early onset schizophrenia in a patient with premature birth, germinal matrix hemorrhage and periventricular leukomalacia. *Schizophr Res*. 2000; 44: 158-160.
5. Lee Moon-In, Shin Hye-Rang, Kim Hack-Ryul, et al. A Case of Schizophrenia with Periventricular Leukomalacia on Magnetic Resonance Imaging. *Journal of Korean Neuropsychiatric Association*. 2010; 49: 256-259.
6. Cosgrove D, Mothersill O, Kendall K, et al. Cognitive Characterization of Schizophrenia Risk Variants Involved in Synaptic Transmission: Evidence of CACNA1C's Role in Working Memory. *Neuropsychopharmacology*. 2017; 13.
7. Roberts GW. Schizophrenia: a neuropathological perspective. *The British Journal of Psychiatry*. 1991; 158: 8-17.

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8. Walton E, Hibar DP, van Erp TGM, et al. Karolinska Schizophrenia Project consortium (KaSP). Prefrontal cortical thinning links to negative symptoms in schizophrenia via the ENIGMA consortium Psychol Med. 2017; 26: 1-13.
 9. Hettige NC, Bani-Fatemi A, Sakinofsky I, et al. A biopsychosocial evaluation of the risk for suicide in schizophrenia. CNS Spectr. 2017; 24: 1-11.
 10. Moon HI, Nam JS, Leem MJ, et al. Periventricular White Matter Lesions as a Prognostic Factor of Swallowing Function in Older Patients with Mild Stroke Dysphagia. 2017; 27.