American Journal of Psychiatry and Neuroscience
2022; 10(2): 77-81
http://www.sciencepublishinggroup.com/j/ajpn
doi: 10.11648/j.ajpn.20221002.13
ISSN: 2330-4243 (Print); ISSN: 2330-426X (Online)

Case Report: Neuro Radiological Screening of First Episode Psychosis Patient Followed up for 3 Years

Mohammed Allam[1, *], Khaled Hamolila[2], Yahya Tikriti[1]

[1]Adult Psychiatry Department, American Center for Psychiatry and Neurology (ACPN), Al Ain, United Arab Emirates

[2]Adult Neurology Department, American Center for Psychiatry and Neurology (ACPN), Al Ain, United Arab Emirates

Email address:

M_a_allam@yahoo.com (M. Allam)

[*]Corresponding author

To cite this article:

Mohammed Allam, Khaled Hamolila, Yahya Tikriti. Case Report: Neuro Radiological Screening of First Episode Psychosis Patient Followed up for 3 Years. *American Journal of Psychiatry and Neuroscience*. Vol. 10, No. 2, 2022, pp. 77-81.
doi: 10.11648/j.ajpn.20221002.13

Received: April 7, 2022; **Accepted**: May 9, 2022; **Published**: May 26, 2022

Abstract: This is a case report of a 21 years old female patient with first episode psychosis fulfilling the DSM 5 criteria for paranoid schizophrenia with an interesting neuro-radiological finding found during the routine neuro-radiological screening of the first episode psychosis. The finding is of a large right lateral intraventricular thin walled cyst and signs of obstruction of the foramen of Monro. The objective of this paper is to present and review the different correlates of this case in light of the theories of etiology of the included disorders. Etiology of schizophrenia has different theories including the infectious theory with relevance to viral infections such as Herpes Simples Virus and Cytomegalovirus also non-viral infections such as Toxoplasmosis. Additional findings have also suggested that increased susceptibility to multiple pathogens in schizophrenic patients, rather than a specific agent, may play a role in the development of schizophrenia. The role of these infectious agents in the etiology of schizophrenia is proposed to be disrupting the neurodevelopment of the brain during critical phases of development in genetically predisposed individuals. On the other hand, the foramen of Monro becomes clinically significant when it is obstructed causing non communicating obstruction. Stenosis of the foramen of Monro has been attributed to infectious origins particularly the TORCH infections causing inflammation and scarring in the region (Toxoplasmosis, Other agents, Rubella, Cytomegalovirus and Herpes Simples). Etiologies of obstruction of the foramen of Monro also includes congenital atresia, vascular malformations, and neoplastic processes. There are different interesting views with regards to the significance of the neuro-radiological findings in the MRI of this case. Some of these views have bases related to clinical experience of directly managing similar cases with a documented outcome related to a specific intervention whether pharmacological or neurosurgical. Other views believe particular findings are incidental with no causal relationships with supporting references as below. In the same context we discussed the overlap between the two disorders in one theoretically possible etiology pertinent to the neurodevelopment theories of both disorders which is the infectious one.

Keywords: Fist Episode Psychosis, Early Onset Schizophrenia, Screening for First Episode Psychosis, Neurodevelopmental Theory of Schizophrenia, Arachnoid Brain Cyst

1. Introduction

Most cases of first episode psychosis are early onset schizophrenia. Peak of early onset schizophrenia falls between the ages of 15 and 25. Very early onset schizophrenia by definition is below the age of 13 and it is very rare [2]. Mania with psychotic features falls also under first episode psychosis category according to some authors. Almost all practice guidelines recommend performing neuro-radiological screening to rule in or out reversible causes for first episode psychosis especially if they are operable [3]. There are some barriers for carrying out the neuro-radiological screening part of the practice guidelines for managing of first episode psychosis, these barriers could be lack of the required facilities, limited government funding and insurance requirements to reimburse the radiological

procedure. If a neuro-radiological finding is suspected to be an etiological factor, whether surgical intervention is recommended or not, follow up of the progression of the finding is required to monitor the consequences of its progression [1-3]. In certain cases, including this case report, ultrasonography was a recommended procedure for the fetal brain during our patient's pregnancy. The neurodevelopmental hypothesis of schizophrenia proposes that pathological neurodevelopmental processes, beginning as early as the first and second trimesters, result in neuronal circuits that are primed to generate psychotic symptoms during adolescence or young adulthood often in the context of heightened biological and psychological stress [4-6]. On the other hand, neurodegenerative hypothesis has support from many studies' findings as patients with schizophrenia also show accelerated age-related brain tissue loss after symptom onset, compared with healthy controls [6, 7, 16]. In this case the presence of the chronic cyst adds another dimension due to the possible role of infection in both the stenosis of the foramen of Monro and the development of first episode psychosis [17].

2. The Case

2.1. The Presentation

A 20-year-old female patient from Middle Eastern descent presented with her family to the outpatient clinic with eight-month history of deterioration in her mental state in the form of developing paranoid delusions of persecution accusing her family of spying on her, poisoning her food and drink plus having perceptual abnormalities in the form of auditory hallucinations giving running commentary about her.

This was followed by further deterioration in her global functioning due to secondary social withdrawal and impaired global functioning. Her presentation to us was delayed as her family had several visits to traditional healers who tried treating her with non-pharmacological "spiritual" means. Initially we investigated her for first episode psychosis by performing structural neuro-radiological scanning and she had relevant blood investigations. Same time a low dose risperidone was initiated and gradually titrated up with limited initial response to oral risperidone dose up to 4 mg. Dose escalation was carefully monitoring by ECG – and her QTc was around 408 msec. Clinical examination and observation to potential side effects were carried out. We made sure that side effects both spontaneously reported by the patient and side effects observed by her family and noted during our examination to be detected and managed.

To our interest the structural MRI revealed chronic cyst in the right lateral ventricle which was quite large measuring 8.4 cm anteroposterior x 5.7 cm side to side x 4.6 cm craniocaudally with cyst content following the CSF signal intensity. There was also a dilated right temporal horn and right occipital horn suggestive of outflow obstruction due to obstructed foramen of Monro. The cyst was stretching the right lateral ventricle and crossing the mid line compressing and narrowing the left lateral ventricle and third ventricle with radiological indicators of chronicity of the cyst such as absence of surrounding edema and presence of thin capsule. Neurological examination by senior consultant neurologist was completely normal despite the massive size of the dilated lateral ventricle This patient was and still neurologically free in clinical neurological examination and has no complains of neurological nature up to the time of writing this report. This patient was followed up for three years during which she responded very well to second generation antipsychotic Risperdione orally and Paliperdione monthly injection. She got pregnant and gave birth to a healthy baby that attained normal developmental millstone of a 24 months old toddler.

Recommendation from the consultant neurosurgeon was to continue following her up and there was no surgical intervention recommend. This patient had no subjective neurological complaints what so ever throughout the 36 months of follow up. Further dose escalation was required to control her psychotic symptoms and eventually at 150 mg of Paliperidone long acting monthly injection (Invega) plus 4 mg of oral risperidone she achieved almost complete remission of her symptoms and regained same level of premorbid functioning plus gaining insight into the nature of her symptoms and the need to be compliant on medications. The necessary educational and supportive therapy in relation to the nature of the illness, its managements, and the rest of the required psychoeducation to enhance compliance was provided to the patient and the family with every visit according to the needs.

Being first episode psychosis and requiring such a dose of antipsychotic is not typical and this would rather go with established cases of schizophrenia [3]. First episode psychosis usually responds to lower doses of antipsychotics [3].

During this process of escalating the dose we were relatively slower than usual in building up the dose as a brain organic pathology might respond by more side effects to an antipsychotic medication [8]. The only observed side effects were tremors which abated significantly with Benztropine 1 mg as an anticholinergic twice a day. Developing side effects in her case was expected as she is antipsychotic naïve and she was on above average dose of an antipsychotic known to target the dopaminergic pathway [3].

2.2. The Pregnancy

She was followed up for 36 months, few weeks after her symptomatic recovery, patient planned to get traditional marriage and following counselling the patient and her family, medications were ceased gradually so that before her wedding day, she was already completely free of Risperidone to avoid possible teratogenic effect despite the safety profile of the Risperidone [9]. It is worth mentioning that, there is no history of teratogenicity in the patient's family and history of mental illness could not be substantiated in her family. Patient got pregnant very early in her marriage and in the second months of her first trimester she developed paranoid delusions colored by her new social status as she accused her mother and sisters of plotting to steal her husband, and acted on that by becoming more possessive of her husband. This

was also reflected on her socialization with her family and resulted in social isolation.

Following calculating the pros and cons we agreed to start the Risperidone gradually, eventually she settled down partially at a dose of 3 mg of the risperidone and after ending the first trimester her dose was increased to 4 mg for better control of her symptoms. She attended the clinic with her father regularly. Her compliance was monitored by her family and luckily the family was a main reason for her recovery.

2.3. Giving Birth

She gave birth to a healthy girl who was bottle fed and attained normal developmental mile stone to the age of 24 months. Patient was very keen to continue the same antipsychotic regimen as her insight improved throughout the process. During her follow up there was no evidence of risk posed towards her baby out of negligence or out of any disturbed behavior and she cared for her baby reasonably. For better control of symptoms, she was managed by Risperidone 4 mg orally and Paliperidone 150 mg monthly injection.

She remained most of the time insightful into the nature of her illness and cooperated when she had breakthrough symptoms by communicating her concerns. She gradually put on weight this possibly could be related to the antipsychotic medication [10, 11] and the combination of other social factors such as lack of exercise and having maids doing her household chores for her. Luckily she had gastric sleeve surgery done and she lost eighteen kilos in the two months preceding her most recent follow up. In her last follow up review she was on Palioeridone 150 mg and Risperidone 2 mg orally. She presented in stable complete remission with no evidence of any break through symptoms. Her functioning at home was described as satisfactory. Her father reported that recently her eyes few days following having the injection they roll up in a noticeable way and this is not that painful but continues for several days. This was quite new and first time to be reported. Our plan was to recommence the anticholinergic twice daily for better results and to cut down Risperidone by 1 mg/week over two weeks until she become only on the long acting injection and to reevaluate the need to the anticholinergic before ceasing it. The timing of developing the oculogyric crisis coincided with the patient's weight loss following the bariatric surgery.

3. Case Presented in the Monthly Conference

This case was discussed in a monthly conference attended by senior consultant psychiatrists and senior consultant neurologists. It is worth mentioning that some colleagues were of the opinion that the brain cyst is a coincidental finding and there is no causal relationship between it and the mental illness. This opinion in based on the knowledge about intraventricular simple cysts, frequently referred to as intraventricular arachnoid cysts or intraventricular cerebrospinal fluid (CSF) cysts, as they are rare and usually asymptomatic. They represent an uncommon cause of an intraventricular cystic lesion like arachnoid cysts elsewhere, they may be asymptomatic and discovered incidentally. This lack of dramatic symptoms most likely reflects the brain's ability to compensate for the presence of a slowly growing or stable expansion, and by the fact that the cyst is already present from early childhood [18]. When a cyst becomes symptomatic, the patient may present with headache, signs and symptoms of obstructive hydrocephalus, focal neurology or seizures [12].

A senior staff had a different opinion based on a previous experience supported the causal relationship as he had seen already a similar case with psychotic symptoms presentation and resolution of psychosis following neurosurgical intervention with the brain pathology.

We also discussed the differences between a cyst dilating the lateral ventricle and the neuro-radiological findings of bilateral dilated ventricles found in patients with schizophrenia which is by far the most replicated neuro-radiological finding in patients with early onset psychosis [13-15]. As I presented the case I had to present the anatomy of the foramen of Monro as it there are one on each side connecting the two lateral ventricles to the third ventricle, it is worth mentioning here that, besides CSF it contains choroid plexus, distal branches of medial posterior choroidal arteries and thalamostriate vein, superior choroidal vein and septal vein [17-18]. We also discussed that, arachnoid cysts have neurodevelopmental etiology and schizophrenia has neurodevelopmental theory of etiology, but we were not sure if this is related. [16] Another question was about the possibility of having an idea about the size of the lateral ventricle of this patient if the cyst and the obstruction were not there.

Figure 1. *Chronic thin walled intraventricular cyst crossing the midline and occupying the lateral ventricle.*

4. Discussion

Several authors have reported brain abnormalities among adult schizophrenic patients, such as reduction in the medial temporal lobe, lateral and third ventricle enlargement, lower brain volume, basal ganglia enlargement and thalamic

abnormalities. Among them lateral ventricle enlargement is by far the most replicated finding. Majority of first episode psychosis patients will not have identifiable disorders by neuroimaging with etiological relevance and only three percent of first episode psychosis has organic origin [1, 3, 13]. This could be a good reason to have data base for the neuro-radiological findings that we encounter during screening for first episode psychosis despite being not common. The negative scan is valuable to establish the functional character of psychiatric disorders. The positive scan will be like a piece of the mosaic put next other pieces in a pursuit to revisit the many theories about the etiology of the first episode psychosis trying to make an informed connection as much as we can. Schizophrenia as the most common form of early onset psychosis has many theories about its etiology. The term schizophrenias were used to describe possible different etiologies of genetic and environmental nature resulting in one or very similar clinical picture with every theory has its support. The neurodevelopmental theory is supported by brain findings at the time of symptoms' onset which are linked to a number of genetic and perinatal risk factors that may disrupt neurodevelopmental processes. Neurodevelopmental pathology could unfold further following the onset of symptoms. The neurodegenerative theory is supported by accelerated tissue loss in patients with schizophrenia compared to controls. The term neuro-progression in describing schizophrenia includes neurodegeneration, apoptosis, and reduced neurogenesis/neuroprotection [5-7]. In this case report there is an apparent overlap with the infection theory etiology as this is pertinent to possible etiology for stenosis of the foramen of Monro and viral infectious theory of schizophrenia. Both have neurodevelopmental origin but again not sure if this overlap is relevant. It is also very important to say that, other colleagues encountered a case presenting schizophrenia like symptoms which was the only manifestation of arachnoid cyst in the temporal fossa with full recovery and no relapse following the neuro-surgical intervention resulting in brain decompression with full remission of psychosis without antipsychotic medications. Same authors also reported encountering two cases with arachnoid cyst pathology in the middle cranial fossa in which surgical intervention was not performed and both cases continued having the psychotic symptoms in spite of being on antipsychotic medications [13].

5. Conclusion

Neuro-radiological screening is an important investigation required for screening for first episode psychosis. The discovery of neuro-radiological finding/s will help the patient management and requires follow up. Causal relationship between the neuro-radiological finding and a first episode psychosis still an area of ongoing research. Discovering the possible relationship/s between a neuro-radiological pathology or brain changes and the development of first episode psychosis will not only shed light on the different possible etiologies of the first episode psychosis but will also shed light on possible ways to manage first episode psychosis or predict its development earlier and intervene earlier based on newer knowledge about its development. It is always important to highlight that association is not necessarily a causation. Accumulating knowledge and findings in first episode psychosis including the neuro-radiological findings will be more beneficial when these data are pooled together in one international scientific body for better extrapolation of the data.

References

[1] Fine. J. D. et al.; J Amer Acad Dermatol (April 1985; 12 (4)). Pp. 2477-78. The Torch Syndrome, A Clinical Review.

[2] Geregory, E et al., Psychiatr Serv. 2017 May 01; 68 (5): 456–461. Incidence and presentation of first-episode psychosis in a population-based sample.

[3] Early Psychosis Guidelines Writing Group and EPPIC National Support Program, Australian Clinical Guidelines for Early Psychosis, 2nd edition update, 2016, Orygen, The National Centre of Excellence in Youth Mental Health, Melbourne.

[4] Fatemi SH, Folsom TD (2009) The neurodevelopmental hypothesis of schizophrenia, revisited. Schizophr Bull 35 (3): 528–548.

[5] Andreasen NC (2010) The lifetime trajectory of schizophrenia and the concept of neurodevelopment. Dialogues Clin Neurosci 12 (3): 409–415.

[6] Matthew M. Nour, and Oliver D. Howes. PNAS The Proceedings of the National Academy of Science, May 4, 2015 | 112 (21) E2745. PNAS | May 26, 2015 | vol. 112 | no. 21 | E2745.

[7] Chiapponi C, et al. (2013) Age-related brain trajectories in schizophrenia: A systematic review of structural MRI studies. Psychiatry Res 214 (2): 83–93.

[8] Leishman's Organic psychiatry – Text book – third edition. 2005.

[9] Edinoff AN, et al. Antipsychotic Use in Pregnancy: Patient Mental Health Challenges, Teratogenicity, Pregnancy Complications, and Postnatal Risks. *Neurol Int*. 2022; 14 (1): 62-74. Published 2022 Jan 3.

[10] Vijapurkar U et al., INVEGA SUSTENNA® [prescribing information]. Titusville, NJ: Janssen Pharmaceuticals, Inc.; January 2019.

[11] Hough D, et al., Paliperidone palmitate maintenance treatment in delaying the time-to-relapse in patients with schizophrenia: a randomized, double-blind, placebo-controlled study. *Schizophr Res*. 2010, 116 (2-3): 107-117.

[12] Ee Shern Liang et al., J Neurointerv Surg, 2021- Intracranial perianeurysmal cysts: case series and review of the literature.

[13] G. A. Baquero, et al., The Open Neuroimaging Journal Vol.: 1–4.- 2014; 8, A schizophrenia-like psychotic disorder secondary to arachnoid cyst remitted with neurosurgical treatment of the cyst. The open neuroimaging journal.

[14] Ceviker N, et-al. Neuroradiology. 1994; 36 (7): 519-2 Computed tomographic ventriculography: a clinicoradiological study of 31 cases.

[15] Bartzokis G, et al. (2012) Multimodal magnetic resonance imaging assessment of white matter aging trajectories over the lifespan of healthy individuals. Biol Psychiatry 72 (12): 1026–1034.

[16] Shane T, et al. Child's nervous system. 2014; 30, 1645-1649.

[17] Stranding S. Grays' anatomy. Churchill Livingstone, (2005).

[18] Priyanthi B, et al. Journal of neurodevelopmental disorders. volume 5, Article number: 21 (2013).