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A rare case of Guillain barre syndrome with overlapping cerebral sinus venous thrombosis masquerading as acute psychosis following COVID-19 vaccination

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ABSTRACT

Guillain barre syndrome (GBS) is a rare autoimmune condition that has a prevalence of 1-2 per 100,000 people each year. Cerebral sinus venous thrombosis (CSVT) occurs at a rate of three to four cases per one million individuals annually. Both have variable clinical presentation with significant morbidity. The therapeutic management of CSVT and GBS presents unique challenges due to peculiar relationship and overlap in presentation. Reports suggest that psychosis may result from autoimmune encephalitis after receiving the COVID-19 vaccination. Hereby the reported case is of a female who is 18 years of age presenting with acute psychotic and catatonic symptoms following covid 19 vaccination with weakening of limbs which suspected an underlying organic pathology. Magnetic resonance imaging was normal but magnetic resonance venogram showed transverse and sigmoid sinus thrombosis and later GBS with CSVT after Covid-19 vaccination was diagnosed. The case was chosen to report a rare condition with an atypical presentation.

Keywords: Guillain barre syndrome, cerebral sinus venous thrombosis, Covid-19 vaccine, Catatonia, Acute psychosis

1. INTRODUCTION

Progressive and ascending limb weakness are hallmarks of Guillain barre syndrome (GBS) and is an autoimmune condition having acute/subacute course. Acute inflammatory demyelinating polyradiculoneuropathy, axonal variants of GBS, with acute motor sensory axonal neuropathy and acute motor axonal neuropathy shares a similar pathophysiology and a poor prognosis. In the general population, it occurs only once or twice per 100,000

people each year. Older patients and male gender appear to be more severely impacted than younger people (Stoian et al., 2021).

In developed nations, the yearly incidence rate of cerebral sinus venous thrombosis (CSVT) is 3 to 4 cases per million in adults. It is considered a subtype of stroke, accounting for just around 2% of all strokes, and primarily affects very young people and kids. It is challenging to diagnose due to the wide variety of possible causes and symptoms. It is characterised by the presence of specific neurological symptoms and signs apart from having headache, seizures, or altered mental status (Abuserewa and Duff, 2021). Because of their overlapping presentation, CSVT and GBS present a unique clinical management challenge and are both extremely rare disorders that can manifest in a variety of ways. Both have been linked to moderate to high mortality (Lagi et al., 2009). Meanwhile, the worldwide rollout of the COVID-19 vaccination has helped alleviate some of the pressure by leading to a noticeable drop in infection rates around the world. Not everyone is on board with the vaccine and numerous myths have been connected to it (Grover et al., 2022a).

In February of 2021, an elderly American woman who had previously received the COVID-19 vaccine became the first person ever diagnosed with GBS following vaccination. Use of a COVID vaccination based on mRNA has been linked to very few cases of sudden onset psychosis. GBS is one of the significant adverse events linked to several different COVID-19 vaccines. There is lack of data on how the COVID-19 vaccine might affect a person's state of mind. Since there is little information available, we have decided to share this case of a female who is 18 years of age who presented with acute psychosis after taking Covid-19 vaccine. With this case report we would like to state our belief that benefits of vaccination in terms of reduced morbidity and mortality outweigh the reported risk of side events like GBS and psychosis and that more research is needed before establishing or excluding an etiological relationship between both in regard to secondary mental illness (Razok et al., 2021a). Some factors known to increase the likelihood of contracting CST or GBS are: Infections, either local or systemic; nevertheless, no etiological link between the two illnesses has been discovered (Ghoummid et al., 2018).

2. CASE PRESENTATION

An 18-year-old unmarried female presented with an acute onset of abnormal behavior, sleep disturbances, fearfulness, smiling and muttering to self with paranoid behavior. Later in about 2 days following above symptoms patient was not responding to verbal commands, unable to walk or stand with weakening of both upper and lower extremities with difficulty in swallowing in the past 7 days.

The patient received the Covid 19 immunisation 2 hours before to the commencement of these symptoms and further investigation into her past indicated that she had been maintaining a satisfactory level of health prior to the injection. Prior to immunisation, there did not appear to be any significant psychosocial stressors. As per informants, 2-3 hours post her first Covid 19 vaccine, she had fever which subsided on its own in a day. But patient reportedly started having sleep disturbances, appeared fearful with inappropriate staring and would exhibit hallucinatory behaviour. Over the next 3 to 4 days, patient's condition worsened as she completely stopped walking and would remain seated or lying down in one place.

Patient was admitted in psychiatry ward in view of above-mentioned change in behaviour. There was no history of delayed milestones or substance abuse. Mental status examination revealed intact consciousness, uncooperativeness, not responding to verbal commands with the presence of catatonic features like negativism, rigidity, mutism and staring. Neurological examination revealed Motor strength was of grade 3/5 and 5/5 in both upper limbs and lower limbs respectively with absent deep tendon reflex in lower limbs. She was not able to walk and remain seated on wheel chair throughout the interview. Her routine investigations showed leukocytosis, raised Erythrocyte sedimentation rate (ESR), Urea, Cerebro Spinal Fluid (CSF) protein, CSF glucose and vitamin B_{12} (Table 1).

Table 1 A provisional diagnosis of First episode psychosis vs Catatonia vs Organic psychosis was made.

Investigations	Values
WBC	17800
ESR	38
Urea	170 mg/dl
CSF protein	119 mg/dl
CSF glucose	100 mg/100ml
Vitamin B_{12}	1200 pg/ml

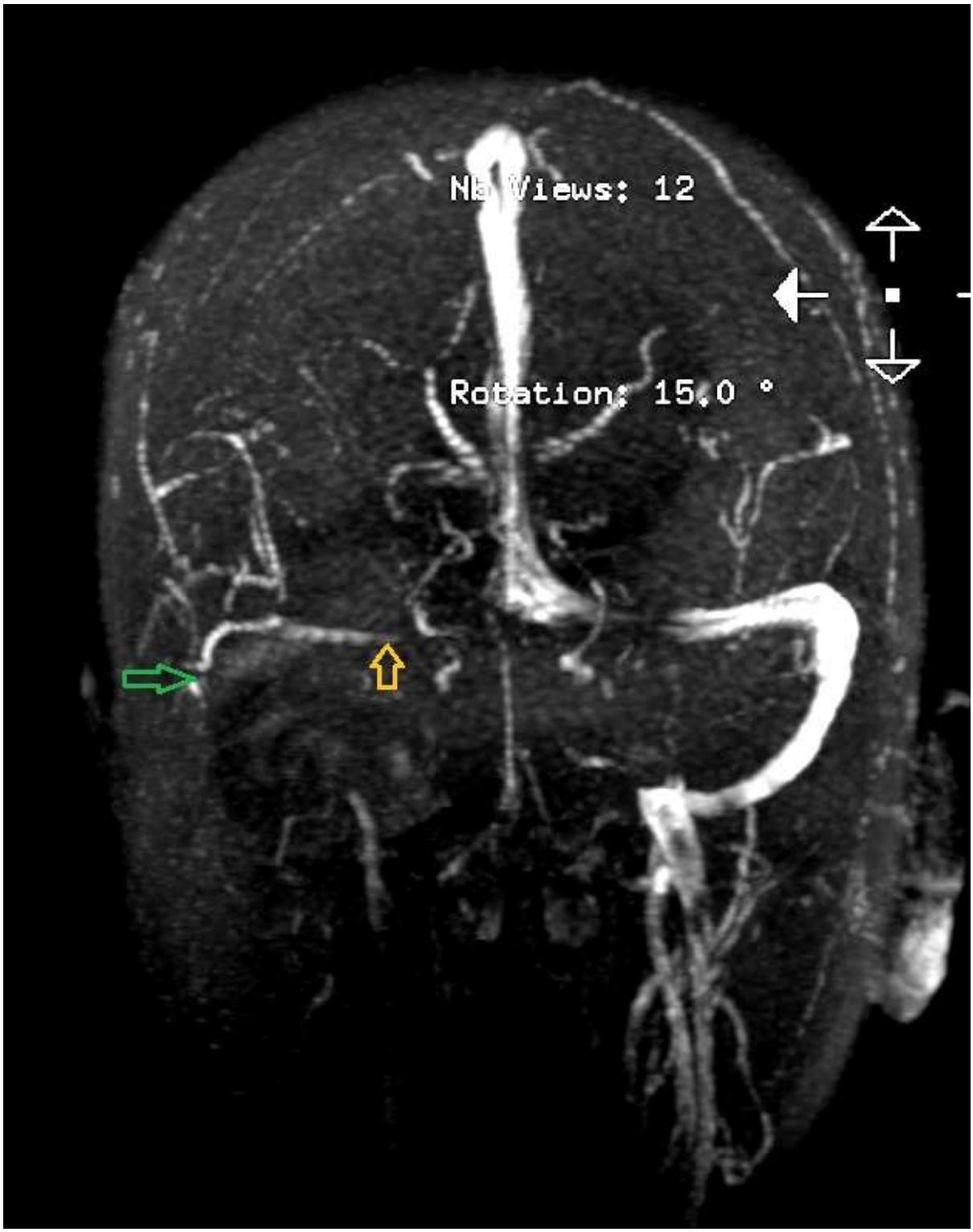

Figure 1 Magnetic Resonance Venogram showing loss of flow signal in right sigmoid and transverse sinuses.

MRI brain was not suggestive of any organic pathology. Patient was then referred to neuro physician and was diagnosed as a case of GBS. Hughes severity scale was applied and a score of 4 (severe) was obtained. MRV advised by the neuro physician showed Right Transverse and Sigmoid sinuses thrombosis (Figure 1 and 2). Nerve conduction study was suggestive of motor axonal neuropathy.

She was given Olanzapine 10 mg and lorazepam 6 mg in view of psychotic and catatonic symptoms respectively. 0.4 gm/kg/day of human intravenous immunoglobulin along with inj. LMWH (low molecular weight heparin) 0.4 cc subcutaneously was given for

5 days for management of GBS. Patient exhibited overall improvement in symptoms over a period of 1 week following which she was moved to an inpatient rehabilitation facility where she spent the next two months undergoing intensive physical, occupational, and supportive therapy.

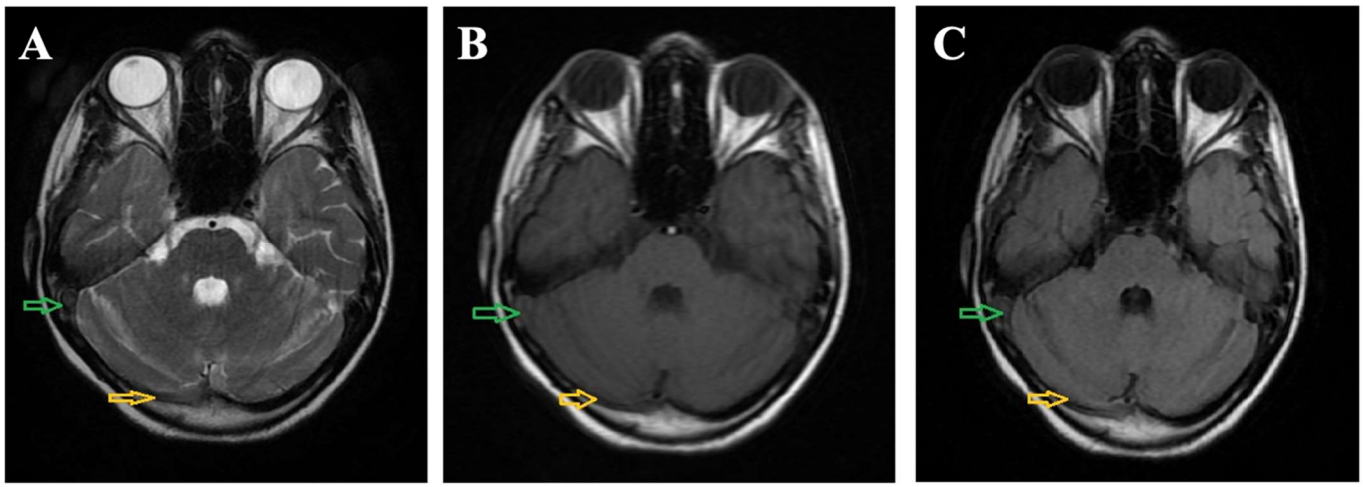

Figure 2 A) T2WI, B) T1WI Axial, C) FLAIR images showing right transverse and sigmoid sinus thrombosis.

3. DISCUSSION

Evidence of an association between the swine flu vaccine and an increase in GBS cases between 1967 and 1977 seemed suggestive, but later research failed to confirm the link. Even the oral polio and tetanus vaccines were subject to the same rules. The results of several earlier investigations hinted at a probable causal relationship, but subsequent epidemiological studies disproved this (Razok et al., 2021b).

Furthermore, information linking vaccinations to an increased risk of psychosis is scarce. Some reports suggest that psychosis may result from autoimmune encephalitis after receiving COVID-19 vaccination, but this is only sparse cases that have been reported. There are very few case reports demonstrating that COVID-19 vaccination caused or exacerbated psychosis due to Guillain-Barré syndrome. Some researchers have speculated that psychosis could result from a rapid elevation of the proinflammatory response and activation of the autoimmune process. In addition, cytokines may increase pyramidal firing and stimulate dopamine production. An aberrant increase in dopamine levels has been linked to psychiatric symptoms. The catatonia may result from dysfunctional associative processes, notably the connection between the frontal lobes and the parietal brain and the motor areas. The chance of developing psychosis after covid vaccination is extremely low; however, medical practitioners should be aware of the possibility so that patients can benefit from early diagnosis (Grover et al., 2022b).

In light of the lack of conclusive molecular evidence between vaccinations to GBS, a temporal relationship cannot be ruled out. Therefore, further research is needed before drawing any firm conclusions (Razok et al., 2021c). Subacute CSVT with no or mild particular symptoms affects just 30% of individuals. In indexed case, it is probable that CSVT preceded the GBS symptoms. There are various challenges in diagnosing such atypical presentation and such diagnosis is challenging as there are high chances of missed findings on MRI brain as it was seen in our patient also and may play a crucial role where the symptoms of the two diseases overlap. If CSVT is diagnosed quickly and accurately, the patient can get the help they need, such as anticoagulant therapy. To conclude, there is no evidence that CSVT causes GBS or that GBS causes CSVT. The unusual link between these two rare diseases, however, may be more than just a coincidence; it may point to a shared infectious mechanism that first manifests as GBS and then travels through the meningeal spaces, cerebral veins, sinus to induce CSVT suggesting that an illness with few GBS-like symptoms may precede CSVT and play a causative role. MRI venography may need to be utilised routinely in patients with GBS if this notion proves correct (Luo et al., 2018).

4. CONCLUSION

This example provides a foundation for future investigations into the link between covid vaccination and acute psychosis and may alert healthcare providers to consider GBS as a diagnosis in such patients. Such atypical presentations can be approached in a better manner with active liaison with neuro physician to prevent further progression of such fatal disorders.

Contribution of Authors

Uniform contributions have been put into the study by each author.

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Informed Consent

Informed consent was taken from the patient and informant for conducting the study.

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Conflict of interest

The authors declare that there is no conflict of interests.

Data and materials availability

All data sets collected during this study are available upon reasonable request from the corresponding author.

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