ABSTRACT:
Consideration of cerebral venous thrombosis as a cause of delirium in psychiatry clinics

A venous infarct due to cerebral venous thrombosis might present only with psychiatric symptoms, such as delirium, psychosis, depression, anxiety, irritability, lack of interest, personality change, apathy/abulia or cognitive deterioration. This condition might be difficult to diagnose on clinical grounds alone. Radiological studies are crucial for establishing a definitive diagnosis. Non-invasive magnetic resonance imaging combined with magnetic resonance venography with and without contrast is the most sensitive diagnostic technique for demonstrating venous infarct and dural sinus thrombosis. This study presents three patients with respective diagnoses of recurrent depression, bipolar disorder, and schizophrenia. Subsequently, each patient developed new-onset agitation, psychosis symptoms, and delirium.

Keywords: cerebral venous thrombosis, psychiatric symptoms, delirium, neuroimaging

INTRODUCTION
Venous infarcts due to cerebral venous thrombosis (CVT) are rare and account for <1% of all strokes. This diagnosis is still frequently overlooked or delayed, resulting from the wide range of clinical symptoms and subacute or lingering onset. Patients at risk of venous thrombus are those with a hypercoagulable state, dehydration, adjacent infections or low cerebral blood flow, or who are using hormone replacement therapy or oral contraceptives, or who are pregnant or puerperal1-3. The most frequent neurological symptoms and signs are headache (95%), focal seizures with or without secondary generalization (47%), unilateral or bilateral paresis (43%), and papilledema (41%). Some cases may present only with psychiatric manifestations, such as delirium, psychosis, depression, anxiety, irritability, lack of interest, personality change, apathy/abulia or cognitive deterioration4. The diagnosis of CVT should be considered in patients, who have no medical history, but present with new neurological symptoms and signs; however, this diagnosis is not usually considered in patients with a previous psychiatric diagnosis who subsequently visit emergency services or psychiatry clinics with delirium and psychiatric symptoms. In a patient with agitated delirium, treatment with sedatives is often started immediately, delaying the diagnosis of CVT.

This study presents three patients with respective histories of recurrent depression,
bipolar disorder, and schizophrenia. Subsequently, each complained of new-onset agitation, psychotic symptoms, and delirium.

**CASE REPORTS**

Written informed consents were obtained from the patients for publication of these case reports and any accompanying images.

**Patient 1**

A 70-year-old woman was admitted to the psychiatric emergency service with new-onset agitation, irritability, visual hallucinations, illusions, delusions, loss of insight, decreased alertness and refusal to eat or drink for 10 days. She had been treated for recurrent depression in the past and had a normal neurological examination despite being confused. Delirium was identified based on the DSM-IV criteria. Although she was treated in a psychiatry clinic with high doses of neuroleptic drugs for 3 days, her state did not improve, while the agitation increased. She had had no oral intake for 15 days. Then, she was evaluated by a neurologist and magnetic resonance imaging (MRI) with and without contrast was performed. MRI of the brain revealed a small venous infarct in the left parietal lobe cortical region in T2 and fluid attenuated inversion recovery (FLAIR) sequences (Figure 1A). Magnetic resonance (MR) venography confirmed thrombosis in the left transverse and sigmoid sinuses and internal jugular vein (Figure 1B).

Hematologic tests were done in order to rule out secondary causes, such as coagulation and hematological disorders, infectious diseases, malignancies, and systemic inflammatory tissue diseases, but no pathology was detected. It was thought that the absence of oral intake and resulting dehydration caused the CVT in this patient.

**Patient 2**

A 50-year-old woman developed agitated delirium. She was evaluated at a health center and then referred to our psychiatry clinic because of her history of bipolar disorder. She was treated as an inpatient for 1 week with a diagnosis of a manic episode. Then, the brain MRI was performed because she had not improved. When a hyperintensity was detected in the left parietal cortex (Figure 2), MR venography confirmed thrombosis in the left transverse sinus.

**Patient 3**

A 50-year-old man, who had agitated delirium for 1 week, was admitted to the psychiatry department with a diagnosis of schizophrenia and treated with his usual antipsychotic agents. This patient also avoided oral intake and

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**Figure 1:** (A) The coronal FLAIR MRI sequence shows hyperintensity within the left parietal lobe corresponding to the site of venous infarction. (B) The MR venogram.

**Figure 2:** T2-weighted MRI shows a hyperintense lesion in the left parietal lobe corresponding to the site of venous infarct.
developed dehydration. As his agitated delirium did not improve despite high-dose antipsychotics, the brain MRI was performed. This showed a hyperintense lesion in the right parietal region. Again, dehydration resulting from reduced oral intake was thought to be the cause of the venous infarct.

**DISCUSSION**

The diagnosis of cerebral venous thrombosis (CVT) and resulting infarction can be difficult due to the large spectrum of clinical manifestations and many associated conditions and etiologies. CVT predominates in young and middle-aged adults and no longer appears in elderly patients. In elderly patients, headache or isolated intracranial hypertension symptoms are less frequent, while mental status changes, delirium, and psychiatric symptoms are much more common at the time of admission. Psychiatric disturbances are sometimes the only presenting symptoms. These include delirium, psychosis, depression, anxiety and irritability, lack of interest, personality change, apathy/abulia, and cognitive deterioration. Therefore, CVT and venous infarct are difficult to diagnose when a patient has a history of psychiatric problems and presents with additional psychiatric symptoms, especially delirium.

Recognizing the presence of CVT in the emergency department or psychiatry clinic requires a high degree of suspicion and depends on the combination of clinical features and neuroradiological findings. Improvements in imaging techniques and increased awareness among clinicians and radiologists have led to the diagnosis being considered more often. It might be difficult to diagnose on clinical grounds alone. Radiological studies are crucial for establishing a definitive diagnosis. Non-invasive MRI in combination with MR venography with or without contrast is the single most sensitive diagnostic technique for demonstrating venous infarct and dural sinus thrombosis.

The patients presented here had previous psychiatric diagnoses and repeated admissions with similar complaints, like delirium. However, these patients were generally diagnosed late. The CVT resulted from insufficient liquid intake and dehydration during their follow-up in the psychiatry ward. CVT might be prevented by ensuring an adequate liquid intake.

In conclusion, CVT can be neurologically silent and present only with psychiatric symptoms. Therefore, we recommend that any changes in the clinical presentation of patients with well-established psychiatric histories or the emergence of atypical psychiatric symptoms in the elderly should be explored further with neuroimaging tests to eliminate organic etiologies. A high degree of suspicion remains the best tool for the rapid diagnosis of CVT, so that appropriate treatment can be initiated at the earliest possible time.

**References:**


