



Cerebral Venous Sinus Thrombosis-Related Epileptic Seizures and Their Clinical Features

Serebral Venöz Sinüs Trombozuna Bağlı Epileptik Nöbetler ve Klinik Özellikleri

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Abstract

Aim: Cerebral venous sinus thrombosis (CVST) is a severe neurological disease that may cause disability and death. Its clinical symptoms are varied. Epileptic seizures may manifest as early signs of the disease in 30-40% of patients. We aim to compare patients presenting with seizures with those presenting without seizures in CVST patients.

Materials and Methods: 50 patients diagnosed with cerebral venous sinus thrombosis were included in the study. The demographic characteristics, initial symptoms, etiologic factors, radiological findings and treatment were analyzed retrospectively. Patients with seizures were evaluated with all their clinical features.

Results: There were 10 patients with epileptic seizures (20%). Nine of the patients were females. All nine female patients had pregnancy-associated seizures. Patients with supratentorial lesions seen was greater than the frequency of seizures. All of the seizures were observed as early seizures (within 14 days). 4 patients focal seizures, secondary generalized seizures were observed in 6 patients. 7 patients who have seizures are also have sagittal sinus thrombosis. Transverse sinus structures affected in the second frequency.

Conclusion: Made in previous studies of patients with DVT reported that about half of the early episodes, in our study, this rate was found to be 20%. Patients who had seizures have similar outcomes with patients without seizures. But the attacks early with an effective antiepileptic treatment was considered to be the prevention of deaths and late seizure recurrence.

Keywords: Cerebral Venous Sinus Thrombosis; Seizure; Epilepsy.

Öz

Amaç: Serebral ven trombozu (SVT); özürüllük ve ölüme neden olabilen ciddi bir nörolojik hastalıktır. Klinik semptomlar çok çeşitlidir. Epileptik nöbetler hastaların %30-40'ında hastalığın ilk bulgusu olarak karşımıza çıkabilir. Bu çalışmada erken dönem nöbet ile gelen SVT hastalarında prognozunun nöbet olmayanlarla karşılaştırılması planlandı.

Gereç ve Yöntemler: Kliniğimizde takip edilmiş 50 SVT hastasının demografik özellikleri, başlangıç semptom ve bulguları, etiyolojik faktörleri, nöroradyolojik bulguları ve tedavileri retrospektif olarak incelendi. İlk klinik bulgusu epileptik nöbet olanlar ve/veya klinik izlemde nöbet geçiren hastalar tüm özellikleri ile değerlendirildi.

Bulgular: SVT hastalarımız arasında epileptik nöbet ile başvuran 10 hastamız (%20) vardı. Nöbet geçiren hastaların 9'u kadın, 1'i erkekti. Nöbet geçiren 9 kadın hastanın tamamı gebelik ile ilişkiliydi. Supratentoryal lezyonu olan hastalarda nöbet görülme sıklığı daha fazlaydı. Nöbetlerin tamamı erken dönem nöbet olarak gözlemlendi (ilk 14 gün içinde). Hastaların 4'ünde fokal nöbet, 6'sında sekonder jeneralize nöbet gözlemlendi. Nöbet geçiren hastaların 7 sinde süperior sagittal sinüs trombusu vardı. İkinci sıklıkta etkilenen yapı transvers sinüstü.

Sonuç: Yapılan daha önceki çalışmalarda SVT'li hastaların yaklaşık yarısında erken dönem nöbet bildirilirken, bizim çalışmamızda bu oran %20 olarak saptandı. Erken dönem nöbet ile gelen SVT hastalarında prognozunu nöbet olmayanlarla benzer olduğu görüldü. Fakat etkin bir erken dönem antiepileptik tedavi ile nöbete bağlı ölüm ve geç dönem nöbet nüksünün önlenileceği düşünüldü.

Anahtar Kelimeler: Serebral Venöz Tromboz; Nöbet; Epilepsi.

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INTRODUCTION

Cerebral venous sinus thrombosis is a serious neurological disorder that can cause disability and death. It is more rarely seen compared to arterial stroke and often occurs in young ages (1, 2). Its incidence is not known exactly but it has been reported to be 1-3 per hundred thousand in western countries (3). It is responsible for 1-2% of adult stroke (1, 2).

Many reasons have been implicated in the etiology of cerebral venous sinus thrombosis. Pregnancy, post-partum infection, systemic inflammatory diseases, hereditary and acquired thrombophilia and antiphospholipid antibody syndrome, hematological diseases, tumours, neurosurgical procedures, medications, and trauma are among its possible causes (4, 6). Still, around 15% of the cases do not reveal any etiologic factors (7, 19). Table 1 presents the CVST-related risk factors.

There is a rich clinical symptomatology in cerebral venous sinus thrombosis. The most common complaint is headache, yet focal neurological deficits like focal or

generalized seizures, hemiparesis, and hemihypoesthesia as well as papilloedema, isolated intracranial hypertension, loss of vision, dizziness, and aphasia can also be seen (2, 4, 5).

Seizures are the first signs of the disease in 30-40% of patients with cerebral venous sinus thrombosis. Poor prognostic factors in CVST patients are being a male >37 years of age, having a Glasgow coma scale score of less than 9 and damaged deep venous structures, detecting intracranial hemorrhage in CT or MRI, and having malignancy and central nervous system infection symptoms (3, 19). A meta-analysis has reported that mortality rate in CVST is 5,6%-9,4%. The complete remission rate is reported to be 88% (20). Seizures are one of the factors that negatively affect the prognosis of the disease. Disease-related mortality was found 3 times more than those patients without seizures (8). In this article, we retrospectively review the files of patients who were diagnosed with CVST between October 2010 and April 2015 in our clinic. We aim to evaluate the clinical features of seizures and seizure rates in these CVST patients.

Table 1. Risk factors associated with Cerebral venous sinus thrombosis.

Acquired risk factors
Infection (meningitis, otitis, tonsillit, sepsis, tuberculosis, HIV)
Pregnancy
Trauma and surgery (head trauma, spinal anaesthesia, radical neck surgery)
Drugs (OCSs, hormone replacement therapy, steroids, lithium, sildenafil)
Hereditary risk factors
Hypercoagulability (protein S, C, antithrombin deficiency, factor V leiden and prothrombin mutation)
Malignity (meningioma, leukemia, lymphoma)
Hematological diseases (anemia, paroxysmal nocturnal hemoglobinuria, polisitemia)
Inflammatory diseases (Behçet's disease, SLE, Wegener granulomatosis, temporal arteritis)
ther
Thyroid diseases (hyperthyroid and hypothyroid)

MATERIALS and METHODS

We retrospectively evaluated the demographic characteristics, initial signs and symptoms, etiologic factors, neuro-radiological findings and treatment processes of 50 patients whose CVST diagnosis were confirmed with MRI and MR venography between October 2010 and April 2015 at the Neurology Clinic, Inonu University, Faculty of Medicine. Patients with initial clinical evidence towards epilepsy and/or those who had seizure during clinical follow-up were evaluated with all their characteristics. Only patients who were monitored for at least 5 months were included studied.

RESULTS

There were 50 patients who received CVST diagnosis in our clinic between April 2015 and October 2010. Of these patients, 37 were females (74%) and 13 (26%) were males. The age range of patients was 20-72 with a mean age of 39,24±13,08. Evaluating clinical characteristics of these patients, we found out that all the patients (98%), except for one, had headache

complaint. Nausea and vomiting was the second most common (52%) complaint after headache. Focal neurological signs such as hemiparesis and hemihypoesthesia along with other visual symptoms were among other frequent (32%) findings. There were 10 patients (20%) who had applied with epileptic seizures. Unconsciousness was the least common (18%) finding. Clinical findings and percentages with regards to patients are summarised in Table 2. Considering the etiology of the patients, we observed that 22 patients had pregnancy-related issues, 5 patients had coagulation disorders while 4 patients had infection (otitis media in 3 patients and tonsillitis in one patient). 17 patients did not show any etiological signs.

9 of the 10 patients presenting with seizures were females. As the first clinical finding, we observed that all seizures were early period seizures. 4 of the patients had focal seizures while 6 showed secondary generalised seizures. None of the patients had status epilepticus. 7 of the patients experiencing seizure had superior sagittal sinus thrombus. The structure affected in the second frequency was the transverse sinus structure. 2 of the 10 patients having epileptic seizures had parenchymal

involvement. Both patients showed hemorrhagic infarction in the posterior parietal region. All of the patients had multiple sinus thrombosis and 1 of the patients had affected deep venous structures. All 9 female patients had pregnancy associated seizures; 8 of these patients had presented in the early postpartum period (2 days to 3 weeks). One of them was in the 34th week of her pregnancy; she also had factor V Leiden mutation. In one of the male patients who presented

with seizures, we could not detect any etiologic factors. All seizure patients were first given heparin therapy followed by a 6-month oral anticoagulant (warfarin) therapy along with antiepileptic treatment. 7 of these patients were treated with levetiracetam therapy while 2 patients received lamotrigine treatment. During the follow-up of the patients, we did not observe any late period seizures. There were no seizure-related deaths either.

Table 2. Clinical findings of the patients.

Clinical findings	Number of patients (n)	Percentage (%)
Headache	49	98
Nausea / vomiting	26	52
Impaired vision	15	30
Unconsciousness	9	18
Epileptic seizures	10	20
Focal findings (hemiparesis / hemihypoesthesia)	16	32

DISCUSSION

Epileptic seizures are the first symptom of cerebral venous sinus thrombosis in 12-31,9% of patients while this can raise up to 44.3% in the early stages of the disease (7, 8). In a series of 90 patients, onset ratio with clinical seizure was 46.7% although only 5.6% of the patients continued to have seizures. Kalita et al.'s study reports that patients with supratentorial lesions have 5 times higher rates for seizures. In particular, patients with lesions in the frontal lobe and parietal lobe have a higher risk to have seizures as the first symptom (9). Bousser and Russell have stated that rate of presenting with seizures is higher if patients have lesions around the anterior central sulcus or focal lesions (10). The mechanism behind frequent seizures in especially hemorrhagic lesions is not fully understood. However, studies on animals and people with traumatic brain damages have shown that degradation products such as hemosiderin cause focal cerebral irritation and, eventually, seizures (11, 12). The literature indicates that mortality rate of patients having seizures is significantly higher than seizure-free patients (13, 14). However, studies investigating the relationship between epileptic seizures and localisation of thrombosis have been unable to come up with a significant relationship (9).

7 of our patients who had seizures had superior sagittal sinus thrombus. The structures affected in the second frequency were the transverse sinus structures. All of the patients had multiple sinus thrombosis and one of the patients had affected deep vein structure. The frequency of seizures are more common in newborns and children compared to adults (15, 16). But the pediatric age group was not included in our study. Sensory and motor deficits particularly are important determinants for aphasia and deep coma seizures (17).

The CVST-related mortality rate is 12.5% in patients who have seizures while it is 6.3% in patients without any history of seizures (18). We did not observe seizure dependent death in our patients. None of the patients

developed late period seizures during the follow-ups. This can be associated with the effective antiepileptic treatment our patients received in the early stages of the disease.

Antiepileptic therapy should be initiated immediately for patients who present with seizures in the acute phase, especially when these seizures are accompanied by supratentorial lesions (13). In patients without seizures, administering prophylactic antiepileptic drugs is not recommended (19). Long-term risk of seizure is approximately 11% (7). To prevent seizure recurrence and status epilepticus in patients at the onset of seizures, antiepileptic drugs are recommended in the acute phase. In long-term persistent seizures, patients usually carry other risk factors for seizure such as supratentorial lesions or motor deficits (19). It is not exactly known how long antiepileptic treatment should be continued; the overall approach is to leave this decision to patients.

CONCLUSION

Previous studies on CVST report early onset of seizures in about half of the patients; this rate was found to be 20% in our study. The prevalence of seizures was higher in patients with supratentorial lesions. However, an early and effective antiepileptic treatment can prevent seizure-related deaths and seizure recurrence.

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