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## CASE REPORT

# NON-CONVULSIVE STATUS EPILEPTICUS FOLLOWING FOCAL MOTOR STATUS AFTER COLONOSCOPY PREPARATION IN AN ELDERLY PATIENT WITHOUT HYPONATREMIA

## ABSTRACT

Non-convulsive status epilepticus is seen in elderly patients who have not previously suffered from epilepsy. The seizures are usually provoked by an acute precipitating factor with underlying conditions such as cerebrovascular disease or brain tumours. Bowel-cleansing preparation has been used in such cases and seems to be safe but can rarely result in seizures due to hyponatremia. Focal motor status epilepticus was seen after colonoscopy preparation in our case. On the fifth day following the control of the focal motor status, non-convulsive status epilepticus was seen with unilateral periodic epileptiform discharges on electroencephalography. The patient had no prior history of epilepsy or seizures but had chronic cerebral damage. Mild hyperglycaemia and slight electrolyte abnormalities were thought to have provoked the low-threshold seizure activity.

**Key Words:** Non-convulsive Status Epilepticus; Bowel Preparation; Elderly; Periodic Lateralized Epileptiform Discharges; Chronic Cerebral Damage.



## OLGU SUNUMU

# YAŞLI BİR HASTADA KOLONOSKOPİ HAZIRLIĞI SONRASINDA HİPONATREMİ OLMASIZIN FOKAL MOTOR STATUSU TAKİBEN GÖRÜLEN NONKONVÜLZİF STATUS EPİLEPTİKUS

## Öz

Nonkonvülfik status epilepticus daha önceden epilepsisi olmayan yaşlı hastalarda görülebilmektedir. Nöbetler genellikle altta yatan serebrovasküler hastalık, tumor gibi serebral patolojisi olan hastalarda akut bir olay tarafından tetiklenmektedir. Kolonoskopi öncesi bağırsak temizliği bu yaş grubunda da güvenle uygulanmakta fakat nadiren hiponatremiye bağlı nöbetler görülebilmektedir. Hastamızda kolonoskopi hazırlığı sonrasında fokal motor status görülmüş, bu durum kontrol altına alındıktan 5 gün sonra ise elektroensefalografide tek taraflı periyodik lateralize epileptiform deşarjlarla karakterize nonkonvülfik status tablosu ortaya çıkmıştır. Hastada epilepsi veya nöbet öyküsü olmamakla birlikte kronik serebral hasar saptanmıştır. Muhtemelen ılımlı hiperglisemi ve elektrolit düzeylerindeki hafif anormallikler nöbet eşiği düşük olan bu hastada nöbet aktivitesini provoke etmiştir.

**Anahtar Sözcükler:** Nonkonvülfik Status Epilepticus; Kolonoskopi Hazırlığı; Yaşlı; Periyodik Lateralize Epileptiform Deşarj; Kronik Serebral Hasar.

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## INTRODUCTION

Non-convulsive status epilepticus (NCSE) is defined as a condition of intermittent or ongoing seizure activity seen on electroencephalography (EEG) without any convulsions for at least 5 min. There are two main types of NCSE: 1) confusion or abnormality in behaviour and 2) continued unconsciousness after a prolonged generalized tonic-clonic seizure with or without subtle motor manifestations (1,2). Seventy percent of elderly patients with NCSE are reported to have not previously suffered from epilepsy (3). Postictal confusion can last from hours to days with this population; therefore, prolonged episodes of confusion should prompt an evaluation for NCSE (4).

The aetiology of NCSE includes cerebrovascular disease, neurodegenerative diseases, brain tumours, trauma, metabolic disturbances and infections (4,5). There are few case reports regarding elderly patients who had seizures due to electrolyte abnormalities, especially hyponatremia, after bowel preparation (6,7,8). The substances used for colon cleansing are known to cause electrolyte abnormalities (6,9). One of these substances is oral sodium phosphate, which is generally well tolerated by patients and has been found to be very effective (9).

EEG and brain magnetic resonance imaging (MRI) are the most important specific investigations for NCSE (4). EEG manifestations include continuous or virtually continuous spike-wave discharge, discrete focal electrographic seizures, diffuse slow activity with or without spikes and periodic or repetitive epileptiform discharges (10).

Our case describes an elderly patient with no history of epilepsy who presented with NCSE with unilateral EEG changes and focal motor status following colonoscopy preparation.

## CASE

An 84 year old female was hospitalized for delirium triggered by infection. On admission, brain MRI showed encephalomalacia due to left posterior cerebral artery infarction, nonspecific subcortical white matter hyperdensity due to ischemic, gliotic changes in the left frontoparietal region and occlusion of the left internal carotid artery. On neurological examination, she was found to be disoriented and had difficulty with complex commands. Past medical history included diabetes mellitus, coronary artery disease, chronic obstructive pulmonary disease, hypertension and peripheral artery disease.

Medication history included ciprofloxacin, 1000 mg/d. After the delirium symptoms were taken under control, colonoscopy was planned for the investigation of anaemia. The patient was given oral sodium phosphate and parenteral fluids to prevent dehydration and electrolyte imbalance. After the preparation prior to colonoscopy, clonic seizures of her right lower extremity were observed, which subsequently spread to the upper extremity and face. These were controlled with diazepam (5 mg). The patient had two more seizures and was diagnosed with focal motor status epilepticus. Considering her age and co-morbidities, 15 mg/kg levetiracetam (LEV) infusion was started and an EEG was performed. As seizures of the right hemibody continued, rhythmic delta frequency activity was recorded on the left hemisphere. Seizure activity was controlled by the end of the LEV infusion. After the seizure, she became aphasic and hemiplegic on the right side. At the start of the seizure, her vital signs were as follows: blood pressure, 110/70 mmHg; pulse, 100/min and temperature, 36.7°C. Her laboratory results before the seizure were as follows: glucose, 200 mg/dL; sodium, 134 mEq/L; potassium, 3.34 mEq/L; calcium, 9.42 mg/dL; magnesium, 1.49 mg/dL and phosphorus, 3.92 mg/dL. We continued with 500 mg/d LEV that was increased to 1000 mg/d in 3 days. On the fifth day, the patient lost consciousness. Her eyes were deviated to the right, and an increase in right hemiparesis was observed. She was determined to be in NCSE, and diazepam (10 mg) was administered. As a result, an improvement in the neurological status was observed. EEG showed periodic lateralized epileptiform discharges (PLEDs) in the left hemisphere and central areas (Figure 1). Her vital signs at this time were as follows: blood pressure, 190/80 mmHg; pulse, 110/min and temperature, 36°C. Laboratory values were as follows: glucose, 254 mg/dL; sodium, 136 mEq/L; potassium, 3.82 mEq/L; calcium, 9.5 mg/dL; magnesium, 1.59 mg/dL and phosphorus, 3.26 mg/dL. The patient was still unconscious during the EEG recording, and hence, 500 mg LEV was given as an intravenous infusion in addition to her routine treatment. When the patient was unresponsive to the LEV infusion, she was considered as refractory status epilepticus and admitted to the intensive care unit. She was intubated and ventilated, along with the initiation of a midazolam infusion (0.3 mg/kg/h). The sedation was gradually terminated when a suppression pattern was observed on EEG. Phenytoin was added with a 750-mg loading dose and a dose of 200 mg/day thereafter, which was subsequently increased to 300 mg/d after considering blood concentration levels. On the following

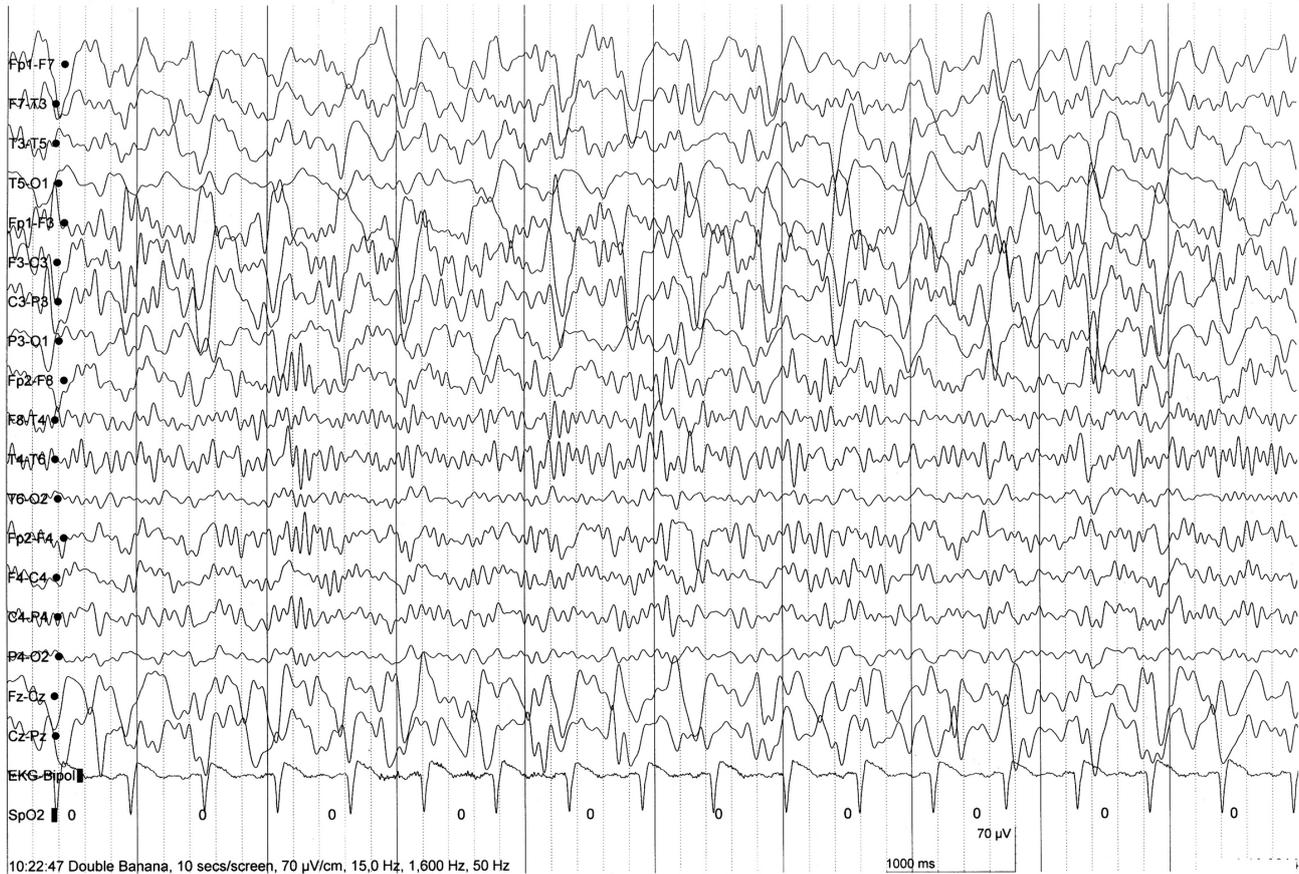


Figure 1— Periodic lateralized epileptiform discharges seen in the left hemisphere and the central areas with a slow background activity.

EEGs, PLEDs in the left hemisphere were observed for approximately 5 more days, which then gradually disappeared (Figure 2). The patient continues to be seizure free while maintained on 200 mg/d phenytoin.

## DISCUSSION

Several studies have shown that the incidence of acute provoked and unprovoked seizures as well as status epilepticus is higher in the elderly (4), and 12%–30% of adults with newly diagnosed epilepsy present with status epilepticus (11). Mortality progressively increases with age, aetiology and duration of status and increases to almost 50% in those older than 80 years (2,3,4). Cerebrovascular disease appears to be

the most common aetiology (4,12). In a study conducted in Turkey, the etiologic factor was determined to be a structural pathology in 44.7% cases, metabolic disorder in 13.2% and systemic infection in 18.4% (5).

Oral sodium phosphate is the most frequently used substance for colonoscopy preparation and is regarded as safe for use in patients older than 80 years. With the frequent use of this substance for bowel preparation, electrolyte shifts are typically minor, transient and clinically insignificant (9). In our case there was only slight electrolyte imbalance. We believe that due to the underlying cerebral pathology, colonoscopy preparation triggered focal motor seizures. Despite the mild hyperglycaemia (254 mg/dl), the HbA1c value was under 6.5, indicating that the diabetes was controlled. Due to



**Figure 2**— Periodic lateralized epileptiform discharges seen in the left hemisphere and the central areas during the administration of the midazolam infusion.

the lowered seizure threshold, hyperglycaemia likely provoked NCSE on the fifth day, without any obvious electrolyte abnormalities. Furthermore, the patient was taking ciprofloxacin, which is known to lower the seizure threshold.

Approximately 44%–66% of focal findings in NCSE are reported on EEG (5,13). PLEDs are the consequence of acute cerebral damage, which may or may not be associated with seizures (14). Periodic discharges should direct attention to the high potential for seizures and status epilepticus (15). After the clinical seizure has ceased, periodic hemispheric after-discharges can be seen, which eventually burn out with time, as seen in our case (15, 16).

The standard treatment for status epilepticus is diazepam, phenytoin, or valproate. In refractory cases, heavy sedation is

recommended (2,17). Due to its circulatory side effects, phenytoin is unsuitable for frail, elderly, or cardiac-compromised patients (18). Recently LEV is recommending as an antiepileptic drug with an excellent safety profile and broad spectrum efficacy in cases where phenytoin is not appropriate, as in our patient (2,17,18).

Because the elderly, especially those with a brain lesion, are far more susceptible to any biochemical changes or dehydration causing them to have a lower seizure threshold, any sort of interventional procedures should be undertaken with great care. There is also the possibility of the elderly patient's condition deteriorating even after recovery; therefore, continuing the attentive care for a longer duration during the postictal period is highly recommended.



### Conflicts of Interest

None of the authors has any conflict of interest to disclose.

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