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Baclofen and Consciousness Disorders in Chronic Hemodialysis: A Case Report

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Abstract **Case Report**

Baclofen is a chlorophenyl derivative of gamma-aminobutyric acid, which is ubiquitous in the central nervous system and which is the main inhibitory neurotransmitter of the Central Nervous System. Overdose of Baclofen treatment can be life-threatening for the patient. We report the case of a 58-year-old patient with a history of hypertension. He was treated with COVERAM 10/10, Physiotens 0.4. He has been on chronic hemodialysis for three years for nephroangioslerosis. The patient was admitted to the hospital by his neurologist for disturbances in alertness after administration of Baclofen 120 mg/day orally for neuromuscular pain. Clinically he had disturbances of consciousness (Glasgow score of 10) without signs of neurological focalization. Hemodynamic constants were normal. The biological assessment revealed chronic end-stage renal failure with Cockcroft clearance at 2 ml/min. The electrocardiogram was without abnormality. Chest x-ray, brain CT scan and lumbar puncture were normal. The electroencephalogram showed diffuse slowing. A probable drug poisoning was mentioned. A 4-hour hemodialysis session was undertaken with a favorable clinical outcome. The objective of our work was to provide our experience on a case of Baclofen poisoning occurring in a chronic hemodialysis patient in the nephrology department of Point "G" University Hospital.

Keywords: Baclofen, Consciousness Disorders, Chronic Hemodialysis Patient.

INTRODUCTION

Baclofen is a muscle relaxant. It acts in the spinal cord as an agonist of the GABA receptor by inhibiting mono and poly sympathetic reflexes by promoting relaxation of skeletal muscles [1]. Baclofen is a chlorophenyl derivative of gamma-aminobutyric acid (GABA), which is ubiquitous in the central nervous system and is the main inhibitory neurotransmitter of the Central Nervous System (CNS) [2]. The exact mechanism of action of Baclofen Baclofen is not yet completely understood. Baclofen is used in the treatment of muscle spasticity. Overdosing on Baclofen treatment can be life-threatening and this risk increases with the expansion of its use. Since 2008 its use has been extended off-label in the treatment of ethanol addiction mainly [1, 2]. The aim of our work was to provide our experience on a case of Baclofen poisoning occurring in a chronic hemodialysis patient in the nephrology department of Point "G" University Hospital.

OBSERVATION

We report the case of a 58-year-old patient with a history of arterial hypertension (hypertension). He was treated with Amlodipine 10/10, Moxonidine 0.4. This was a chronic hemodialysis patient for nephroangioslerosis followed for three years at two sessions per week by a left humerocephalic fistula. The patient apparently consulted a neurologist for neuromuscular pain in the lower limbs, the latter of whom had put him on Baclofen at a dosage of 2 tablets twice a day or 120 milligrams per day orally. He was admitted to the hospital by this attending physician for impaired alertness after the administration of Baclofen. In the hospital emergency room, the patient presented a state of agitation and a fluctuating confusional syndrome

with disturbances of consciousness (Glasgow score of 10) without signs of neurological focalization, and a few episodes of fasciculations of the lower limbs. The respiratory examination found a respiratory rate of 15 cycles/minute, without rheumy of the bases. Hemodynamic constants were normal (blood pressure 139/78 mm hg, heart rate 72 beats/minute). Our patient was afebrile at 36.7°Celcuis. The biological assessment found: a normal ionogram, chronic end-stage renal failure with Cockcroft clearance at 2 ml/min, normal liver enzymes. The electrocardiogram (ECG) was without abnormality **(Figure 1).**

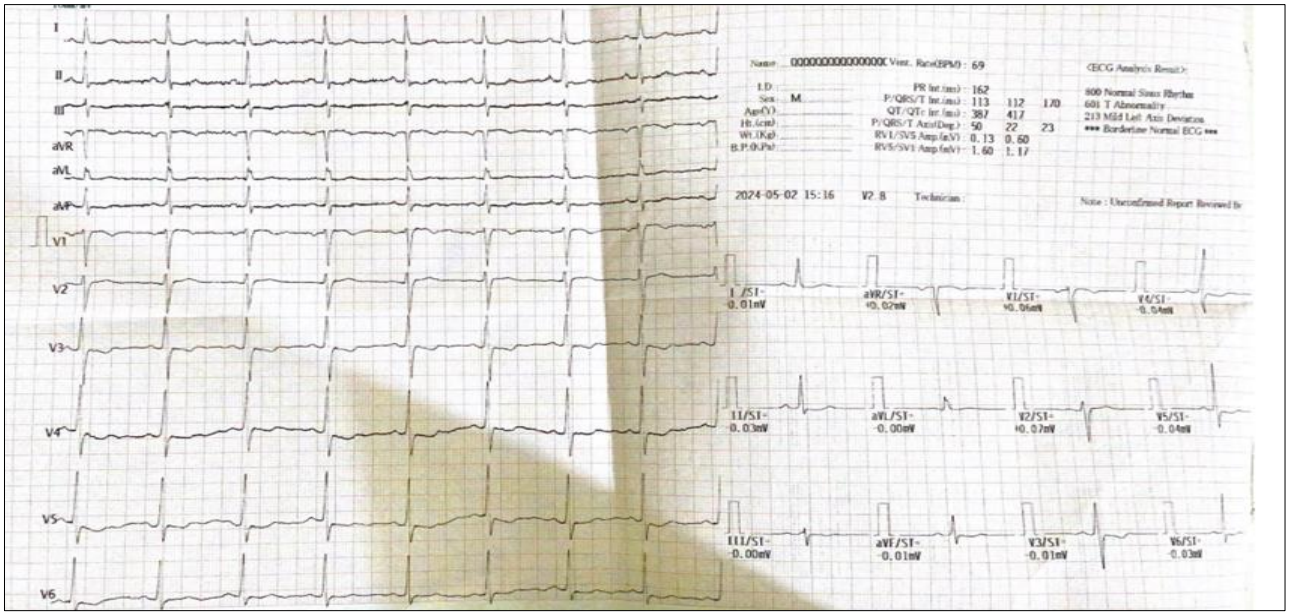

Figure 1: Normal ECG

The frontal and lateral chest x-rays were normal, in particular there was no alveolar-interstitial infiltrate **(Figure 2).**

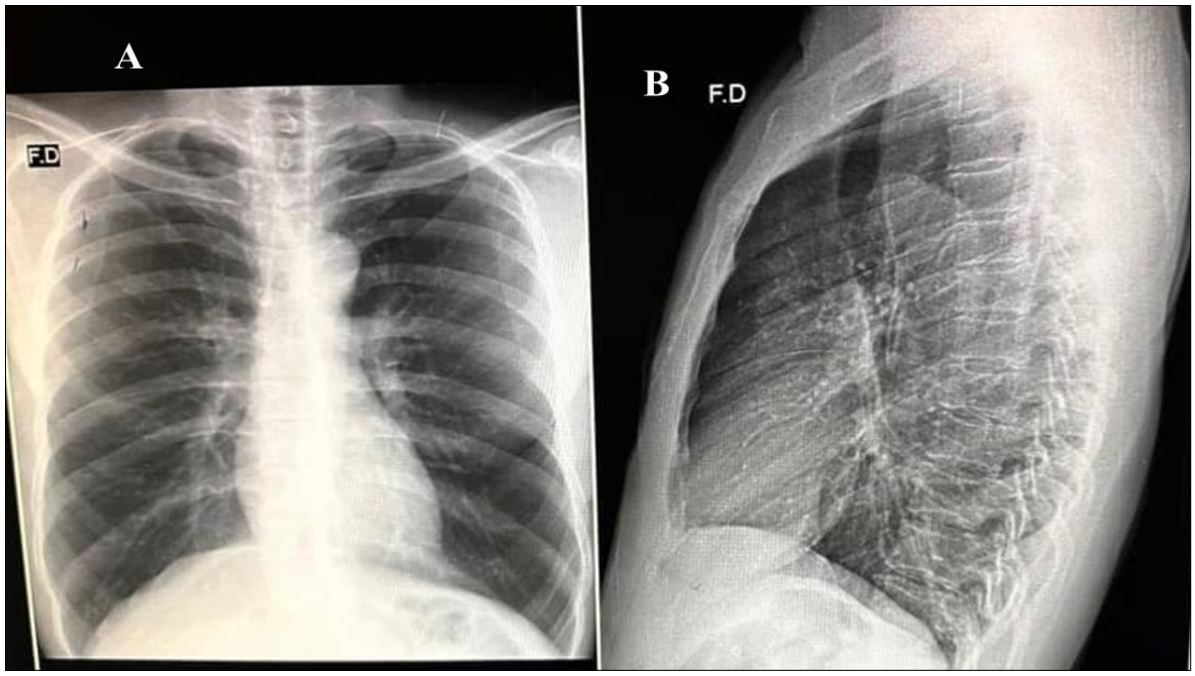

Figure 2: Normal frontal (A) and lateral (B) chest radiograph

The neurological assessment included a brain computed tomography (CT) scan and a lumbar puncture which were normal **(Figure3).**

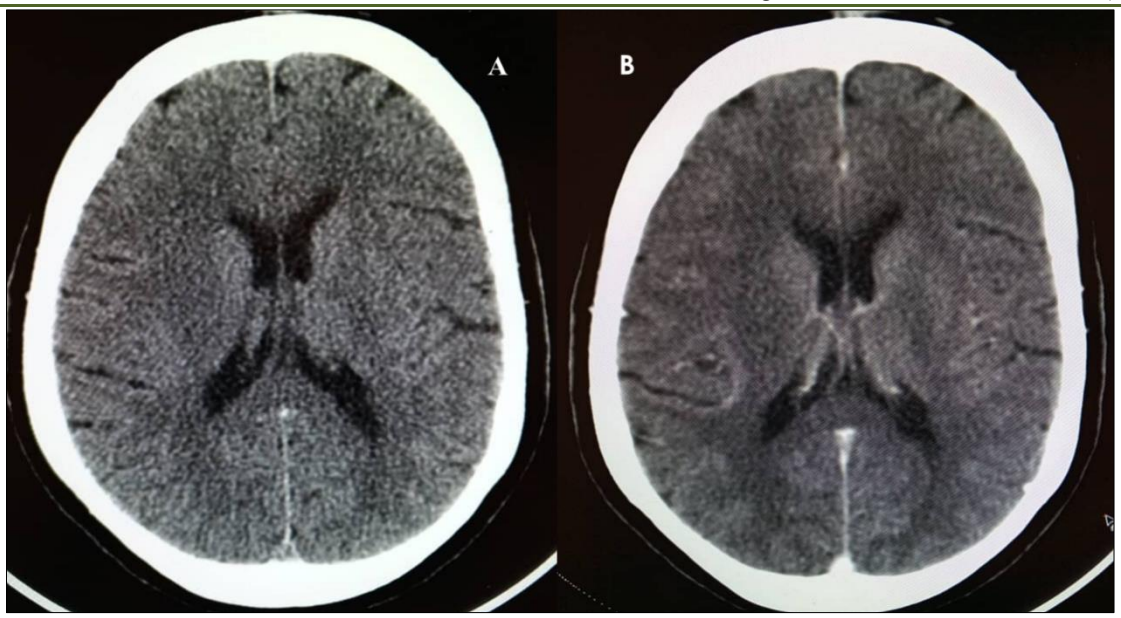

Figure3 (A and B): normal brain CT scan

The electroencephalogram (EEG) showed diffuse slowin **(Figure4).**

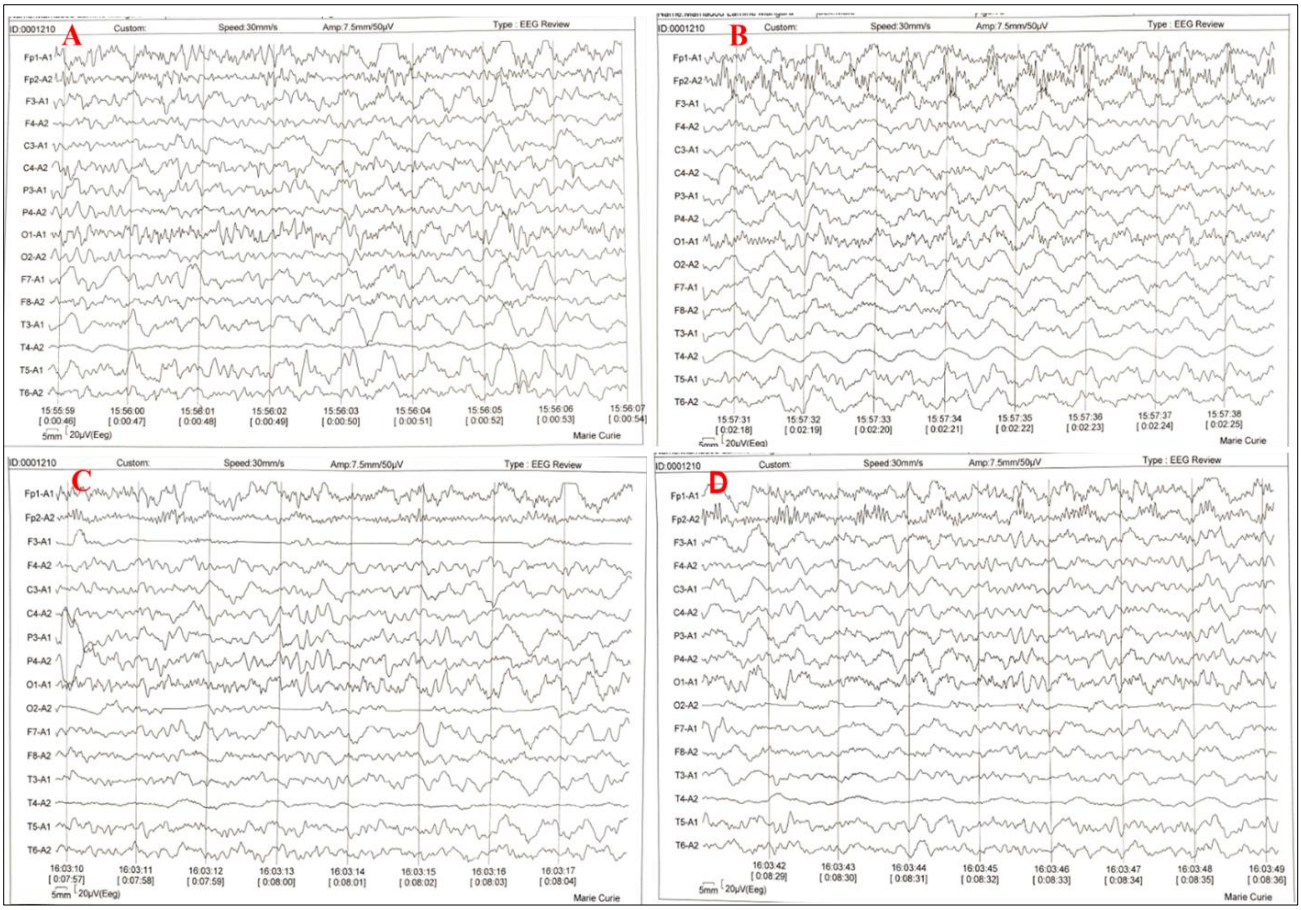

Figure 4 (A, B, C and D): EEG showing diffuse cerebral pain

Faced with this atypical picture of cerebral suffering, probable drug poisoning was suspected. The concordance of the symptoms with possible Baclofen poisoning was confirmed by the patient's parents by bringing the rest of the medication. The patient was admitted to intensive care. The decision to have a hemodialysis session was taken given the argument of an overdose of Baclofen and the persistence of the

symptoms for more than 72 hours. Baclofen blood testing was not carried out due to the lack of resources and infrastructure available in Mali. A 4-hour hemodialysis session was undertaken with a spectacular clinical evolution: neurological symptoms disappeared, respiratory depression reduced, with an increase in respiratory frequency. The patient was discharged from the hospital after 5 days of hospitalization.

DISCUSSION

Baclofen is an agonist of GABA B receptors of the central and peripheral nervous system. It is commonly used orally and intrathecally in the treatment of muscular spasticity of central origin. Baclofen is a neurotropic, lipid-soluble drug allowing passage of the blood-brain barrier. Its absorption is digestive. It has low protein binding (30% of cases), a low volume of distribution 0.7 liters per kilogram, and a short half-life of 6-8 hours. It has low hepatic metabolism into an inactive metabolite and its elimination in unchanged form is renal in 85% of cases, mainly by glomerular filtration [3, 4]. These characteristics explain the risk of accumulation in the event of renal failure and the dialyzable nature in the event of intoxication as in our case. The plasma dosage of Baclofen is not easily carried out routinely in Mali and even in Africa and this will limit the confirmation of intoxication a posteriori. In the treatment of spasticity, the optimal dosage is 40 to 80 mg 3 times a day. In people with kidney failure, it is recommended to start with only 5 mg per day. El-Husseini analyzed 42 patients

Baclofen poisoning and kidney failure; he recommends not using Baclofen in patients with a clearance lower than 3ml/min [5]. Thus, the common but mild side effects observed during the treatment of spasticity are likely to increase in number and severity. The most common side effects of oral Baclofen are drowsiness and muscle weakness, reversible within 24/48 hours after reducing or stopping the medication. In the event of an overdose, there is mainly depression of the central nervous system with hypotonia, hyporeflexia, disturbances of consciousness, up to coma with loss of brainstem reflexes which can mimic a state of brain death [2-7]. Our patient had persistent muscle pain and impaired consciousness. Myoclonus or seizures may be observed and the electroencephalography trace may show an appearance of "bust-suppression" or pseudoperiodic diffuse paroxysmal abnormalities [8].

Our case had diffuse slowing. Respiratory depression is common and cardiovascular abnormalities may be present. Despite the presence of serious signs, there is a low morbidity and mortality linked to Baclofen overdose. In the 107 patients of WeiBhaar *et al*., [9], and the 23 patients of Leung *et al*., [6-9], poisoned at massive doses (up to 2.5 grams), only 3 deaths (1 from cerebral edema and 2 not directly linked to the intoxication) were reported, and there were no after-effects. discharge from hospital. Our patient's CT scan was normal. Symptoms secondary to poisoning are quickly reversible after elimination of the drug. There is no antidote. Treatment is mainly symptomatic by assisting organ failure. Hemodialysis is not systematically indicated in Baclofen poisoning but is to be discussed given the severity of the clinical picture and/or in the event of renal failure as was in our observation. Hemodialysis significantly reduces the half-life of Baclofen, from 15.5 to 2.06 hours for Wu *et al*., [3]. Our case showed that a short hemodialysis session allows rapid clinical improvement. Baclofen is a booming treatment whose overdose can be life-threatening for patients.

Conflict of Interest: None.

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