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Case Report

# Carbamazepine Induced Hypertension: A Case Report

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## Abstract

We report a case of 70 year old women with primary hypertension and trigeminal neuralgia of the right side of face. Hypertension was well controlled with one antihypertensive drug for long time which became uncontrolled after administrating Carbamazepine for trigeminal neuralgia. The adverse effects of carbamazepine include cardiac conduction abnormalities, aplastic anemia, bone marrow depression, congestive heart failure, peripheral edema. Hypertension has rarely been documented with therapeutic doses of carbamazepine. On admission the patient had blood pressure 180/110 mmHg, despite an antihypertensive therapy. Treatment with additional antihypertensive medication did not reduce her blood pressure. After discontinuation of Carbamazepine levels of blood pressure were normal. Therefore, we considered that resistant hypertension was induced by oral carbamazepine therapy.

**Keywords:** Trigeminal neuralgia; Carbamazepine; Hypertension

## Introduction

Trigeminal neuralgia also known as tic douloureux is distinctive facial pain syndrome that may become chronic and recurrent. It is characterized by unilateral pain following the sensory distribution of cranial nerve V [1]. Carbamazepine except for treating epilepsy in adults and children. It is also used for treatment of trigeminal neuralgia, neuropathic pain, and bipolar affective disorder [2].

The drug of choice of trigeminal neuralgia is carbamazepine. Most common adverse effects observed with Carbamazepine are drowsiness, unsteadiness, constipation nausea and vomiting. There are various side effects related to different systems [3]. Although rare, a variety of cardiovascular effects including hypertension, congestive heart failure, edema, aggravation of hypertension, hypotension, syncope and collapse, aggravation of coronary disease, arrhythmias, AV block, thrombophlebitis have been reported [4].

## Case Presentation

A 70 year old woman was hospitalized in department of Neurology because of nausea, vomiting, headache, numbness in left side of body. She had long history of hypertension and trigeminal neuralgia. Hypertension was well controlled with two antihypertensive drugs prescribed by the cardiologist.

Two years ago, she was diagnosed with trigeminal neuralgia of wright side of her face and it was prescribed carbamazepine. Short time after she used Carbamazepine her blood pressure went very high which resulted in discontinuation of the same.

Several days before of hospitalization she develops severe pain of the right side of the face and general practitioner prescribed Carbamazepine tablets 200 mg 4 × 1. Short after using carbamazepine her hypertension was very high, in admission was 180/110 mmHg in the left arm and laying position, she complained severe nausea, vomiting and headache. Neurologic examination was unremarkable.

Antihypertensive therapy was prescribed: Lizinopril 20 mg and Hydrochlorothiazide 25 mg tablets 1 × 1.

Even with antihypertensive therapy hypertension was persistent. Since the facial pain was persisted we decided to adjust Carbamazepine dosage and we reduced it to 150 mg but hypertension was still present. We reduced Carbamazepine again until doses of 50 mg but hypertension was still present so we had to discontinue Carbamazepine. After withdrawal of Carbamazepine treatment, blood pressure reached normal values with the same antihypertensive regimen. Since facial pain was persistent we started treatment with Gabapentin tablets 300 mg 3 × 1. Meanwhile the patients showed normal glucose, electrocardiogram and echocardiogram, MRI results were normal. Further investigation ruled out secondary hypertension such as primary aldosteronism, pheocromocitoma and renal artery stenosis. Patient didn't smoke and drink alcohol. Other medications included Aspirin 100 mg Family history: she didn't have history of hypertension in family.

Our patients didn't have vascular disease and hypertension was normal after discontinuation of Carbamazepine and after detailed review of patient's medical and family history, we concluded that Carbamazepine induced hypertension to our patient.

## Discussion

Our patient with Trigeminal neuralgia developed severe hypertension soon after being started with Carbamazepine and resolution after discontinuation. This is the first report of carbamazepine induced hypertension in Kosovo. Literature search was conducted and we find other reports on Carbamazepine–induced hypertension in different countries [4-10].

Carbamazepine is pharmacologically complex drug and its mechanism of action is not fully understood [4]. Cardiovascular toxicity is sine most frequently in overdoses and patient requiring high maintenance doses, although a wide range of cardiac irregularities have been reported with usual prescribed doses, and serum levels maintained in the standard reference range [4]. Carbamazepine is well-known inducer of P450 enzymes that mediate drug interactions [8].

Our case report suggests drug-drug interactions between antihypertensive therapy and Carbamazepine. Several prescribed antiepileptic drugs including Carbamazepine stimulate the synthesis of a broad range of mono-oxygenase and conjugating enzymes. These agents are well known to reduce the duration and action of many lipid and non-lipid soluble drugs including antihypertensives. Izoenzime

CYP3A4 which is subset of P450 enzyme, has the greater abundance in the liver and intestine, and is responsible for the metabolism of the largest number of clinically used drugs, as well as a range of endogenous substrates such as prostaglandins, steroid, hormones and fatty acids [9].

A causal association between hypertension and Carbamazepine was assessed by World Health Organization (WHO) probability method and Naranjo's adverse drug reactions probability scale [10].

The WHO probability method and Naranjo's Adverse Drug Reactions Probability Scale showed "certain" and "definite" (Naranjo's score 10) association respectively.

Hypertension is a rare side effect of Carbamazepine, reported in limited number of studies, however our presented case and other cases reported by the other authors suggest a carful monitoring of blood pressure in hypertensive patient who begin taking Carbamazepine. Carbamazepine therapy seems not to be dose dependent, since it was associated with increased blood pressure even at very low doses (50 mg). Based on this evidence we recommend that Carbamazepine therapy should be reassessed in all patients developing de novo hypertension while taking antihypertensive therapy and Carbamazepine.

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