

## The Risk of Sudden Decrease of Severe Arterial Hypertension

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Received date: May 31, 2016; Accepted date: July 28, 2016; Published date: July 31, 2016

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### Abstract

**Objectives:** The main objective of this clinical case presentation is to attract attention about the dangerous risk of sudden decrease of the value of blood pressure in hypertensive patients with severe value of blood pressure.

**Methods:** I present the clinical case of a woman patient 61 years old, hypertensive, with severe value of blood pressure (BP=210/110 mmHg) with a therapeutic scheme at home with Metoprolol 2 × 25 mg/day and Lisinopril 2 × 5 mg/day, but without a good response and control of the value of blood pressure (BP=180/90 mmHg). For this reason the patient was investigated very carefully in direction of secondary hypertension, but all the investigations were normal and nothing was found like a cause of this. Because the value didn't decrease to come in normal range after this therapeutic scheme, the patient goes one day to the Emergency Department because after she administrated at home the dosages of medications, the value of blood pressure maintain high 200/100 mmHg. In the Emergency Department they administrated 1 drug of Captopril 25 mg and one ampoule of Furosemid i.v. , but after one hour because the value of blood pressure remained the same 200/100 mmHg, was administered once again a ampoule of Furosemid i.v. and unexpected the patient present a lypothimia with arterial hypotension (BP=70/40 mmHg) and surprising severe bradycardia=30 bates/min, immediately was administrated ½ of ampoule of atropine i.v. and after 5 minutes the value of blood pressure become BP=160/80 mmHg and HR=74 bates/min.

### Results and discussions

1. A vagal reaction could be possible because of sudden decrease of the value of blood pressure?
2. A posterior-inferior myocardial infarction could be possible, but the normal image of EKG and normal level of Troponin I=0.01 ng/mL and CPKMB=4.2 ng/mL excluded this possibility.
3. Unstable angina pectoris was excluded because the patient didn't have chest pain and missed ischemic-lesion changes on EKG.
4. Suspicion of a possible sick sinus syndrome? The patient, after Holter monitorization, presented a pass of brady-tachy syndrome confirmed safe the diagnosis of sick sinus syndrome and performed a pacemaker implantation with good evolution.

**Conclusion:** The therapy of arterial hypertension must be personalized and sudden decrease of the value of high blood pressure is very dangerous with patients with an unknown sick sinus syndrome, because it can develop to an unexpected severe bradycardia.

**Keywords:** Risk; Sudden decrease; Arterial hypertension

### Introduction

The topic of arterial hypertension is one of the most common and most researched topic all over the world and it exist also many protocol guidelines in the medical practice, however unexpected situation can appear anytime, because the therapy must to be personalized.

### Objectives

The most important objective of this clinical case presentation is to attract attention that the sudden decrease value of blood pressure is dangerous and could develop unexpected sudden death.

### Materials and Methods

I present the clinical case of a woman patient 61 years old, hypertensive, with severe value of blood pressure (BP=210/110 mmHg) with a therapeutic scheme at home with Metoprolol 2 × 25 mg/day and Lisinopril 2 × 5 mg/day, but without a good response and control of the value of blood pressure (BP=180/90 mmHg). For this reason the patient was investigated very carefully in direction of secondary hypertension, but all the investigations were normal and nothing was found to be a cause of this. Because the value didn't decrease to come in normal range after this therapeutic scheme, the patient goes one day to the Emergency Department because, after she got administrated at home the dosages of medications, the value of blood pressure maintain high 200/100 mmHg. In the Emergency Department was

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Furosemid i.v. and unexpected the patient present a lypothimia with arterial hypotension (BP=70/40 mmHg) and surprising severe bradycardia=30 bates/min (Figure 1).



Figure 1: EKG – Severe sinus bradycardia =30 beats/min.

With risk of sudden death, but immediately administrated ½ of ampoule of atropine i.v. and in 5 minutes the value of blood pressure become BP=160/80 mmHg and HR=74 beats/min (Figure 2).

- A suspicion of a possible sick sinus syndrome?

Of course a vagal reaction is a transitory event, with good response at Atropine administrated i.v, but sick sinus syndrome is a very serious disease then we need an implantation of a pacemaker.

The hypothesis of the literature and mechanism behind the event discussed is a vagal reaction in condition of sudden decrease of the value of blood pressure, because the vagal stimulation can develop sudden bradycardia and hypotension in same time.

The Bezold–Jarisch reflex (also called the Jarisch-Bezold reflex) involves a variety of cardiovascular and neurological processes which cause hypopnea (excessively shallow breathing or an abnormally low respiratory rate) and bradycardia (abnormally low resting heart rate) [1].

The Bezold–Jarisch reflex is responsible for the sinus bradycardia that commonly occurs within the first 60 minutes following an acute myocardial infarction [2], and explains the occurrence of AV node block in the context of acute posterior or inferior myocardial infarction [3]. Bradycardia in this setting may be treated with atropine.

The Bezold–Jarisch reflex has been suggested as a possible cause of profound bradycardia and circulatory collapse after spinal anesthesia [4].

Additionally, M2 receptors reduce the contractile forces of the atrial cardiac muscle and reduce the conduction velocity of the atrioventricular node (AV node). However, M2 receptors have no effect on the contractile forces of the ventricular muscle [5].

## Evolution

After the first 24 hours monitorization, the patient performed a Holtermonitorization, and presented a pass of brady-tachy syndrome (Figure 3), confirmed safe the diagnosis of sick sinus syndrome.

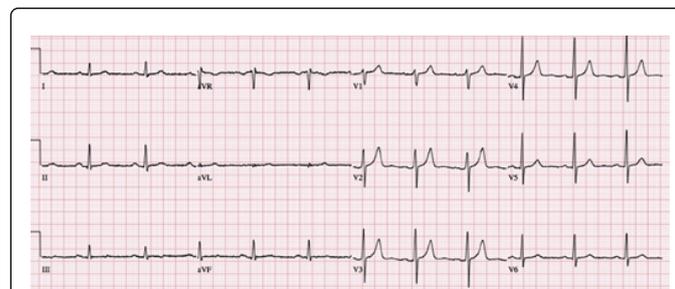


Figure 2: EKG- Normal heart rate 74 beats/min after atropine i.v.

The level of cardiac enzymes: Troponin I=0.01 ng/mL and CPKMB=4.2 ng/mL were in normal range and was excluded a possible posterior-inferior myocardial infarction and also the EKG image doesn't suggest this diagnosis, because the image in leads DII, DIII and a VF looks normal.

After this unexpected complication, the patient was followed and monitories the heart rhythm 24 hours but no other pass of bradycardia appear.

## Results and Discussion

The most important discussion of this situation is how was it possible to appear an unexpected and severe bradycardia=30 beats/min and an arterial hypotension (BP=70/40 mmHg) and put the patient's life in danger?

- A vagal reaction could be possible because of sudden decrease of the value of blood pressure?
- A posterior-inferior myocardial infarction could be possible, but the normal image of EKG and normal level of Troponin I=0.01 ng/mL and CPKMB=4.2 ng/mL excluded this possibility.



**Figure 3:** The Brady-tachy syndrome-sick sinus syndrome.

The patient was referred to the Cardiovascular Surgery Department, they implanted a pace maker, with good evolution of the patient after the procedure.

### Conclusion

The most important conclusion of this clinical case presentation is that the therapy of arterial hypertension must to be personalized and the sudden decrease of the value of high blood pressure is very dangerous to the patients with an unknown sick sinus syndrome, because a severe bradycardia and arterial hypotension can appear unpredictable anytime and this will put the patient's life in danger.

In conclusion, we must to assess all the hypertensive patients with Holter monitoring before therapy management. This is an ideal but not impossible.

Only in this way we can detect an unknown sick sinus syndrome and can prevent in the future dangerous events like this situation mentioned before.

We never have to lower blood pressure too suddenly to avoid a dangerous incident like the one shown.

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