Tachycardia-bradycardia Syndrome in a patient undergoing pertrochanteric fracture repair under spinal anesthesia

Naumovski F.¹, Kartalov A.¹, Kuzmanovska B.¹, Toleska M.¹, Shosholcheva M.²

¹PHI University Clinic of Anesthesia, Reanimation and Intensive Care – Skopje

²PHI University Clinic of Surgical Diseases “St. Naum Ohridski” - Skopje

Introduction

Sick sinus syndrome is a conduction abnormality of the heart with most frequent incidence in the elderly patients. SSS can be presented as a different kind of conduction disorder including: sinus bradycardia, sinoatrial block, tachycardia-bradycardia syndrome, or unexpected sinus arrest. Symptoms are often intermittent, changeable, and unpredictable. SSS could be a co-morbidity in a patient with a well established diagnosis of CAD (coronary artery disease), but it can be present in a patients without any previous history of cardiac disease also. ECG and 24-hour Hollter monitoring are the diagnostic settings needed for establishing the diagnosis of Sick sinus syndrome. Atrial pacing is the most superior therapeutic measure in treating Sinus node dysfunction.

Case report

We present a 89 years old female patient undergoing pertrochanteric fracture repair under spinal anesthesia. The patient has previous history of Hypertension and Dementia. There is no data for any other comorbidities, nor previous diagnosis of any cardiac disease. 12 channel ECG has been done and has shown: sinus rhythm, with HR of 60 and normal morphology of the P wave, QRS complex and the ST-T segment in all leads. The patient has received 2.4 ml of Bupivacaine 0.5% and 10 micrograms of Fentanyl. Dural puncture was done at the L3-L4 level in an aseptic technique, and clear liquor was seen prior to application of the anesthetic.

The first hour after the application of the anesthetic went uneventful. One hour after application of the anesthetic there was sudden onset of rapid heart rate rise from 58 to 112 and after that abrupt spontaneous resolution of the tachycardia from 112 to 54 bpm. The patient was awake and not experiencing any pain, nor breathing difficulties. After the resolution of the first episode of tachycardia, the patient had experienced another episode of abrupt rise of the heart rate from 54 to 109 followed with spontaneous falling of the heart rate to 48 bpm. The episodes of rapid and abrupt onset of changes in heart rate has continued without any significant changes in the blood pressure levels, neither any electrocardiographic changes in the P, QRS and ST-T segment morphology. When the lowest value of 45bpm was reached, the onset of bigeminy was noted on the ECG. 0.5mg of Atropine was given to the patient immediately, after what restoration of normal sinus rhythm and termination of the episodes of tachycardia and bradycardia was seen. Postoperative ECG in PACU has been made without any signs of cardiac suffering, nor conduction abnormalities.

Discussion

SSS is characterized by sinus node dysfunction with an atrial rate inappropriate for physiologic requirements. Despite the idiopathic SSS, a lot of the patients who present with sinus node dysfunction are having some stage of CAD, are experiencing acute myocardial infarction, or had experienced a myocardial infarction in the past.

Bradycardia-tachycardia syndrome is more common in older patients with advanced form of SSS. Symptoms associated with SSS may be worsened in patients who are receiving digitalis, verapamil, beta blockers, sympatholytic agents such as clonidine, methyldopa, and anti-arrhythmic agents. Sinus node dysfunction can be precipitated perioperatively because of increased vagal tone caused by anesthesia or surgical intervention.

According to Thomas A. Csepe et al. the process of intranodal fibrosis could be a serious modulator of the sinoatrial function as important as in sinoatrial dysfunction. In cardiac diseases the up-regulation of the fibrosis could lead to slowed SAN rhythm due to fibrotic replacement of pacemaker cells. We've made a research on Pub Med Central for case reports of manifestation of SSS in a patient under anesthesia. We've found eight case reports from 1994 to 2017 in a patients undergoing general anesthesia, one undergoing mixed general and epidural anesthesia and one under spinal anesthesia. Eight of nine presented patients were previously healthy without any known cardiac disease except one who had well established diagnosis of ischemic cardiac disease. All of them had normal preoperative ECG findings Different types of conduction and heart rate abnormalities, including asystole, were presented in all cases after induction of the patients under general anesthesia. During the anesthetic management of intra and post-operative period in 4 of 8 patients temporary or permanent pacing was performed as a therapeutic measure. The resolution of tachycardia-bradycardia syndrome after giving the 0.5mg of atropine shows a possible relationship between the local anesthetic induced temporary sympatectomy and parasymphyc predominance on one hand and the onset of tachycardia-bradycardia syndrome as a form of SSS on the other hand. This means that not only anesthetics used during general anesthesia, but local anesthetics also could be involved in the process of triggering the onset of clinical manifestation of previously clinically silent SSS.

Conclusion

Spinal anesthesia could be as much potent triggering factor for sinus node dysfunction as general anesthesia is. Detailed pre-operative assessment of every patient, especially elderly and those with well known cardiac disease is a must.

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