



ANAESTHETIC MANAGEMENT OF A PATIENT WITH SINUS NODE DYSFUNCTION FOR CAROTID ARTERY STENTING-A CASE REPORT

Dr. Manju Manmadhan	MD, PDF - Consultant Anaesthetologist And Neurocritical Intensivist, Rajagiri Hospital Aluva.
Dr Jithin Antony Bose*	MD, DM – Consultant Neurologist, Rajagiri Hospital Aluva. *Corresponding Author
Dr Sunesh E.R	MD, DM – Consultant Neurologist, Rajagiri Hospital Aluva.
Dr Gigy Kuruttukulam	MD, DM – HOD, Neurology & Neurointerventionlist , Rajagiri Hospital Aluva.
Dr.Jacob Chacko	MD, DM – Consultant Neurologist, Rajagiri Hospital Aluva.
Dr.Jayasankar VR	MD, DM – Fellow in Stroke and Intervention, Rajagiri Hospital Aluva.
Dr.Ancy Rehman	MBBS – Medical Officer, Neurology, Rajagiri Hospital Aluva.

ABSTRACT

Sinus node is the pacemaker node of the heart that regulates rate and rhythm of heart according to the physiological needs of body. Sinus node dysfunction is manifested as episodes of bradycardia and asystole. It poses an anaesthetic challenge because of the haemodynamic fluctuations pre and post carotid stenting and bradycardia episodes during carotid stenting. We report the anaesthetic management of a patient with sinus node dysfunction for carotid artery stenting.

KEYWORDS : Sick Sinus Syndrome, Pacemaker Insertion, Carotid stenting

Sinus node dysfunction includes progressive rhythm disturbances and mortality. Rhythm disturbance associated with SND evolve over a period of time with high risk for thromboembolic and cardiovascular events(1). Carotid stenting is a first line treatment in severe carotid occlusive disease. Procedure related haemodynamic changes and carotid baroreceptor sensitivity may prolong hospitalization and increase procedure related morbidity and mortality (2,3). The frequency of haemodynamic depression is between 13 and 75.9%(4–8). Sinus node dysfunction patient coming for elective carotid artery stenting under general anaesthesia poses unique challenge for anaesthesiologist in terms of perioperative control of hemodynamics and balancing the neurological assessment. We report the successful management of sinus node dysfunction patient for carotid stenting under general anaesthesia and reviewed the available literature.

Case report:

65 year old man was admitted for elective right carotid artery stenting. He is a known case of stroke and coronary artery disease. Patient came with left leg weakness and noncontrast MR Angiogram showed absent flow related signals in entire right internal carotid artery and right vertebral artery. Cardiology evaluation was done preprocedure, 2D Echo revealed global LV hypokinesia, severe LV systolic function and grade 2 diastolic dysfunction and holter showed sinus node dysfunction. Preoperative Hb was 14.4g% and Serum Creatinine was 0.92 mg/dL. Preoperative fasting for 6 hours done, with sips of water 2 hours before procedure. Tab. Rantidine 150mg and Tab Metoclopramide 10 mg was given on the day before and on the morning of procedure. Intravenous fluid plasmalyte A was started on the morning of procedure. Preinduction monitors such as ECG, Spo2 and left radial artery cannulation was done under local anaesthesia with continuous arterial monitoring. Under local anaesthesia temporary cardiac pacing was done by Cardiologist. Premedication Inj Midazolam 1mg, and Inj fentanyl 150 ugm, given, Induced with intravenous 7.5mg Etomidate and Inj.cisatracurium 7.5mg. maintenance of anaesthesia was done with O2:Air[2:3]. Sevoflurane and cisatracurium infusion

1-3 microgram/kg/min. Blood pressure was maintained 20% above baseline with noradrenaline infusion 0.05-0.1 microgram/kg/min before stenting. Post stenting blood pressure was kept under control by NTG infusion 5-6 microgram/min, which was tapered and stopped. Extubation was done with reversal agents Inj. Neostigmine and 0.8mg glycopyrrolate. Inj. ondansetron 8 mg i/v was given before extubation. Temporary pacemaker was removed after extubation. Strict intake/output monitoring was done with a target urine output of 0.5-1ml/kg/hr, with 60ml/hr plasmalyte A and 0.9% normal saline alternatively given. started orally after four hours with sips of water. Postoperative haemoglobin was 13.1gm%. Patient was discharged on the fourth postoperative day.

DISCUSSION:

Sinus node is the pacemaker of heart. It is innervated by sympathetic and parasympathetic system and works in a balance between both. In sinus node dysfunction it is unable to meet the physiological demands of the body(9,10). Patients may be asymptomatic or can have syncope or giddiness like symptoms.

Sinus node dysfunction can occur due to sinus node fibrosis, medications and toxins, childhood or familial disease or due to cardiovascular events(11). It can be a disorder of impulse generation or impulse propagation. The patient whom carotid stenting was done is a known case of coronary artery disease who underwent coronary artery bypass graft.

Inducing anaesthesia in sinus node dysfunction can precipitate hypotension, bradycardia, decrease in cardiac output and sinus arrest. Detailed cardiac evaluation was done with plan for temporary pacing before induction of anaesthesia was done(12). General anaesthesia was planned for this patient for better patient cooperation, control of haemodynamics and airway. Carotid stenting also posed so many challenges in sinus node dysfunction patients. Carotid baroreceptors are located at bifurcation of common carotid artery. They are innervated by ninth and tenth cranial nerves. They are stretch receptors monitoring the changes of

blood pressure through distension of vessel wall. The afferent impulses activated by arterial BP pass by nucleus tractus solitarius, caudal ventrolateral medulla and the rostral ventrolateral medulla, reach sympathetic preganglionic neurons leading to decrease in sympathetic activity and increase in parasympathetic activity and complete the feedback circuit of the carotid reflex. This results in bradycardia, decreased cardiac contractility and decreased peripheral vascular resistance. (13). Manipulation of carotid sinus during carotid artery stenting may cause baroreceptor dysfunction (14). During stenting baroreceptors are stretched by the angioplasty balloon and stent, which is similar to the stimulation of blood pressure and they send impulses to brainstem which may result in decrease in heart rate and blood pressure. A patient with sinus dysfunction is likely to develop bradycardia and sinus arrest during the procedure. General anaesthesia in contrast to monitored anaesthesia care poses the challenge of neuromonitoring in such patients, various modalities like EEG, Evoked potentials, Transcranial Doppler and Near infrared spectroscopy can be used.

CONCLUSION:

Sinus node dysfunction along with carotid occlusive disease for carotid artery stenting poses a challenge for the anaesthesiologist. Detailed preoperative evaluation with multidisciplinary involvement, balance between cerebral and coronary perfusion, avoiding extremes of haemodynamic fluctuations and early extubation for neurological assessment are the anaesthetic goals. With the help of new generation anaesthetic agents and control of haemodynamics perioperative period was uneventful. Extubation was done immediately after the procedure which helped in rapid neurological assessment.

Conflicts of interest: None

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