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Review Article

## A REVIEW ON ETIOLOGY, DIAGNOSIS AND TREATMENT OF SICK SINUS SYNDROME

\*Neethu J and <sup>1</sup>Aadarsh V.S

<sup>1</sup>Fifth year Pharm D student, Sree krishna College of Pharmacy and Research Centre,  
Thiruvananthapuram, Kerala, India

\* Associate Professor, Department of Pharmacy Practice, Sree krishna College of Pharmacy and  
Research Centre, Thiruvananthapuram, Kerala, India

[Aadarsh1997adhi@gmail.com](mailto:Aadarsh1997adhi@gmail.com)

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**Abstract:**

*Sick sinus syndrome is a group of heart rhythm problems due to problems with the sinus node that includes sinus bradycardia, sinus pauses, recurrent episodes of fast heart rate, tachy-brady syndrome, etc. Sick sinus syndrome most often occurs in elder people (greater than 50yrs). Most common cause of sick sinus syndrome in children is heart surgery on upper chambers. Coronary heart disease, high blood pressure, and aortic and mitral valve diseases may occur as comorbidity of sick sinus syndrome. Symptoms may include angina, Confusion, fainting, fatigue, dizziness. The diagnosis tools are ECG, holter monitor, event recorder, implantable loop recorder. Medicines like digitalis, calcium channel blockers, beta-blockers, and antiarrhythmics may alter the function of sinus node, People with sick sinus syndrome eventually need a permanent artificial pacemaker to maintain a regular heartbeat.*

**Keyword:** bradycardia, tachy-brady syndrome, holter, ECG, pacemaker

**Corresponding author:**

Neethu J,  
Associate Professor, Department of Pharmacy Practice,  
Sree krishna College of Pharmacy and Research Centre,  
Thiruvananthapuram, Kerala, India  
[Aadarsh1997adhi@gmail.com](mailto:Aadarsh1997adhi@gmail.com)

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## INTRODUCTION:

The heartbeat starts in atria (the upper chambers of the heart). This area is known as heart's pacemaker (sinoatrial node, sinus node or SA node). Its major role is to keep the heart beat steady and regular. Sick sinus syndrome is a group of heart rhythm problems such as:

- When heartbeat rate is very slow called sinus bradycardia
- When heartbeat pauses or stops, called sinus pauses or sinus arrest
- Episodes of a fast heart rate
- Slow heart rhythms and fast heart rhythm occurs alternately, called bradycardia-tachycardia or "tachy-brady syndrome"

## Etiology

Sick sinus syndrome most often occurs in elder people (greater than 50yrs). It is due to scar-like damage to electrical pathways in the heart muscle tissues. Most common cause of sick sinus syndrome in children is heart surgery on upper chambers. Coronary heart disease, high blood pressure, and aortic and mitral valve diseases may occur as comorbidity of sick sinus syndrome. Sick sinus syndrome is uncommon disease, but not that much rare. Sinus bradycardia occurs more common than the other types of the condition.

Tachycardia (rapid heart rhythms) may in the top chambers of the heart may be part of the sick sinus syndrome. It includes atrial fibrillation, atrial flutter, atrial tachycardia. A period of fast heart rates is followed by very slow heart rates. When there are periods of both slow and fast heart rates (rhythms) the condition is called tachy-brady syndrome. Medicines like digitalis, calcium channel blockers, beta-blockers, and antiarrhythmics when given at high dose can make abnormal heart rhythms.

## Symptoms

Usually, sick sinus syndrome may have no symptoms but it may mimic those of other disorders.

Symptoms may include:

- Chest pain or angina
- Confusion or other changes in mental status
- Fainting or near-fainting
- Fatigue
- Dizziness or lightheadedness
- Sensation of feeling the heart beat (palpitations)
- Shortness of breath,during walking

## Diagnostic tools:

The heart rate and blood pressure may vary between low to normal. Symptoms of sick sinus is diagnosed during episodes of arrhythmia. However, the link is often hard to prove.

**Electrocardiogram (ECG):** In this test, sensors (electrodes) are attached to your chest and legs to create a record of the electrical signals traveling through your heart. The test may show patterns that indicate sick sinus syndrome, including a fast heart rate, slow heart rate or long pause in the heartbeat after a fast heart rate.

**Holter monitor:** This portable ECG device is carried in your pocket or in a pouch on a belt or shoulder strap and it automatically records your heart's activity for 24 to 72 hours and asked to keep a diary of symptoms.

**Event recorder:** This portable ECG device which may be worn up to a month, enables your doctor to correlate symptoms and heart rhythm. When you feel symptoms, you should push the button, and a brief ECG recording is saved.

**Implantable loop recorder:** This small ECG device is implanted under the skin of your chest and is used for continuous monitoring of your heart's electrical activity.

## Complications

Complications may include:

- Angina
- Decreased exercise capacity
- Fainting (syncope)
- Falls or injury caused by fainting
- Heart failure
- Poor heart pumping

## Treatment

The primary treatment goals are to reduce or eliminate symptoms and to manage and treat other comorbid condition of sick sinus syndrome.

**Medication changes:** Medicines like digitalis, calcium channel blockers, beta-blockers, and antiarrhythmics may alter the function of sinus node so such medication should be monitored or alternative should be prescribed

**Pacing the heart:** People with sick sinus syndrome eventually need a permanent artificial pacemaker to maintain a regular heartbeat. This small, battery-powered electronic device is implanted under the skin near your collarbone by a minor surgical procedure. The pacemaker is programmed to stimulate your heart to beat normally and their rhythms can be

treated with a single-chamber pacemaker, which uses only one wire (lead) in the right atrium to pace the heart rate. Most people benefit from dual-chamber pacemakers that include one lead in the right atrium paces the upper chambers, and one lead in the right ventricle paces the lower chambers.

If you have a rapid heart rate as part of your sick sinus syndrome, you may need additional treatments to control these rhythms, they are

**AV node ablation:** This procedure can control fast heart rhythms in people with pacemakers. It involves applying radiofrequency energy through a catheter to destroy ablate around the atrioventricular (AV) node between the atria and the ventricles, this stops fast heart rhythms from reaching the ventricles and causing problems.

**Cardiac ablation for atrial fibrillation:** This procedure is similar to AV node ablation and ablation targets heart tissues that can lead to atrial fibrillation. This eliminates atrial fibrillation itself, rather than just preventing it from reaching the ventricles.

#### Lifestyle and home remedies

Exercise and eat a healthy diet. Live a heart-healthy lifestyle by exercising regularly. Eat a diet with essential portions of non-starchy vegetables, fruit and whole grains and modest portions of fish, lean meats, poultry and dairy. Maintain a healthy body weight. Overweight will increase your risk of developing heart disease. Monitor blood pressure and cholesterol and take medications as prescribed to correct high blood pressure (hypertension) or high cholesterol.

Do not smoke. If you smoke and can't quit on your own, talk to your doctor about ways to keep smoking under control or to quit the habit. If you drink, do so in moderation. In some conditions alcohol should completely avoided. Don't use illegal drugs. Talk to your doctor about an appropriate program if you need rehabilitation to end illegal drug use.

Control stress. Avoid unnecessary stressful lifestyle and learn coping techniques to handle normal stress in a healthy way. Visit your physician regularly and report if any signs or symptoms are present.

#### CONCLUSION:

Sinus node dysfunction is a disease of older adults, although it can occur at any age. Sinus node dysfunction develops in one of every 600 cardiac patients of 65 years of age or older. Males and females are equally affected. Furthermore, it causes various metabolic derangements such as

hypothyroidism, hyperkalemia, hypokalemia, hypocalcemia, and hypothermia. On the other hand, atrial arrhythmia could be another reason for morbidity of the disorder. To improve patient outcome, the clinicians should consider a dual chamber pacing due to increased risk of AV block in sinus node dysfunction. Sick sinus syndrome are in increased risk of stroke. Therefore, clinicians should take necessary precautions and use the accurate diagnostic method in order to provide the best treatment to ensure prolonged life span.

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