

Inappropriate Sinus Tachycardia (IST)

What is IST?

Inappropriate Sinus Tachycardia (IST) is a condition in which an individual's resting heart rate is abnormally high – greater than 100 beats per minute or rapidly accelerating to over 100 beats per minute without an identifiable cause for the tachycardia, although small amounts of exercise, emotional or physical stress are triggering factors.

An ECG will not show any abnormalities (other than an abnormally fast heart rate), as IST arises within the sinus node where normal sinus rhythm is generated i.e. the heart rhythm is arising from the normal location but at an inappropriately high rate.

It is a relatively new disorder (first recognised in the late 1970s) that is underappreciated by many in the medical profession and with many doctors regarding it as a psychological condition. Individuals with this condition can find themselves increasingly disabled and experiencing high levels of anxiety.

Symptoms

IST is primarily experienced by young women in their thirties, who may have been suffering symptoms for a few years. The main symptoms of IST include:

- ♥ Palpitations
- ♥ Shortness of breath
- ♥ Exercise intolerance
- ♥ Fatigue
- ♥ Resting heart rate of greater than 100bpm
- ♥ Sleeping heart rate of 70 – 90bpm
- ♥ Heart rate will rapidly reach 150bpm upon minimal exertion

Potentially related symptoms:

- ♥ Drop in blood pressure upon standing
- ♥ Blurred vision
- ♥ Dizziness
- ♥ Syncope
- ♥ Pre-syncope
- ♥ Sweating

What causes IST?

Unfortunately, to date nobody knows. There is a belief that IST is a result of the sinus node having an abnormal structure. There is another view that individuals with IST might be super-sensitive to adrenaline as the smallest amount of exertion can cause a pronounced rise in the heart rate. However, a number of informed medical professionals believe there are a number of factors and disorders which point to disturbance within the autonomic nervous system. It is for this reason that it is a condition that can be mistaken for, or overlap with, postural tachycardia syndrome (PoTS). Please contact Arrhythmia Alliance for further information.

How is IST diagnosed?

The following guidelines may help towards securing the correct diagnosis for an individual presenting with IST symptoms.

1. ECG for resting heart rate - a resting heart rate generally must exceed 100bpm to be considered IST

24hr ECG/ holter monitor - the average heart rate during a 24 hr period is usually >95bpm. When lying down or sleeping there should be little reduction in heart rate

Exercise/stress test - demonstrate an inappropriate heart rate response to exercise
2. Symptoms documented should indicate tachycardia
3. Other known causes of sinus tachycardia must

be excluded - these include anaemia, hyper thyroidism, phaeochromocytoma, diabetes induced autonomic dysfunction, fever, and dehydration

4. Sometimes an EP Study will be performed to exclude atrial tachycardia before an IST diagnosis is finally made
5. Echocardiogram – to rule out any structural abnormality of the heart

Treatment

IST doesn't shorten life expectancy, therefore treatment is aimed at alleviating symptoms. Patients can choose to do nothing, and live with the symptoms if they are not that severe or have little impact on their life. Or they can take medications to try and slow the heart rate, have an ablation procedure to destroy the heart tissue responsible for the tachycardia, or have open heart surgery if symptoms are very severe and other treatment options have failed.

Medication A variety of medications have been tried and it is a matter of trial and error to see if a helpful medication can be found for each individual. Beta blockers are often tried first; calcium channel blockers (diltiazem or verapamil) are an alternative. Where there is an overlap with autonomic dysfunction, Fludrocortisone, Midodrine, and serotonin-reuptake inhibitors have all been used. More recently drugs such as Ivabradine have been tried, but with varying results. It is important not to make things worse with side effects from the drugs, which may be worse than the symptoms of IST itself.

Ablation Ablation of the sinus node (either to modify the node or destroy it completely) has been used with some success, but this is very variable and may not be long-lasting, and ablation carries its own risks. Ablation is a surgical procedure that uses either heat or freezing methods to destroy areas of the heart tissue via a catheter (thin, flexible tubes passed through blood vessels to the heart). Scar tissue

is deliberately created in an attempt to prevent the tachycardia. It is best to discuss this with an Electrophysiologist who specialises in this form of treatment.

Self help

Cognitive behavioral therapy (CBT) has had some success in helping patients come to terms with IST, and help manage their lives.

It is very important to recognise that, however disabling symptoms may be, this is not a life threatening disorder and lifespan is normal; with no increased risk of strokes or heart attacks. The number of people who develop any problems with their heart function as a result of a long-term fast heart rate is also very small. So, in some people, the best thing is to wait and see how things develop – it may improve on its own, particularly once a person has been reassured that there is no other sinister problem. Where there is an overlap with autonomic dysfunction, increasing salt and fluid intake may help.

IMPORTANT POINTS

Where sinus tachycardia is identified it is important to rule out other treatable conditions before making the diagnosis of IST – it may be that there is a curable cause.

IST is not a life threatening condition but symptoms can be very disabling.

A variety of therapies exist, but it is important not to make things worse with any treatment.

The opinion of a specialist, usually an Electrophysiologist, can be helpful.

Please contact Arrhythmia Alliance for further information and advice regarding IST.

Acknowledgements: Arrhythmia Alliance would like to thank all those who helped in the development and review of this publication. In particular, thanks are given to Dr Kim Rajappan (Electrophysiologist) and Dr Charlotte D'Souza (Arrhythmia Alliance medical writer & reviewer).

President: Prof. A John Camm **Trustees:** Mr Mark Bullock, Mr Nigel Farrell, Dr Adam Fitzpatrick, Prof. Richard Schilling, Trudie Lobban MBE

© Arrhythmia Alliance Registered Charity No. 1107496
Published April 2010, Reviewed January 2017

endorsed by
 **Department of Health**