



Inappropriate sinus tachycardia

This information sheet from Great Ormond Street Hospital (GOSH) explains the causes, symptoms and treatment of inappropriate sinus tachycardia and where to get help.

What is inappropriate sinus tachycardia?

Inappropriate sinus tachycardia (IST) is a condition that causes an abnormally high resting heart rate. IST is thought to be caused by an abnormality in the sinoatrial (SA) node, although other factors may also affect development of IST.

The heart has an electrical system that makes it pump. An electrical impulse starts in a specialised area of heart tissue in the right atrium called the SA Node. It then passes from the right atrium through to the ventricles via the AV node. As the impulse passes through the atrium it makes it pump blood into the ventricle. It has the same effect when it passes through the ventricle.

This electrical impulse travels through the heart each time it beats. It is something that happens naturally – it cannot be felt.

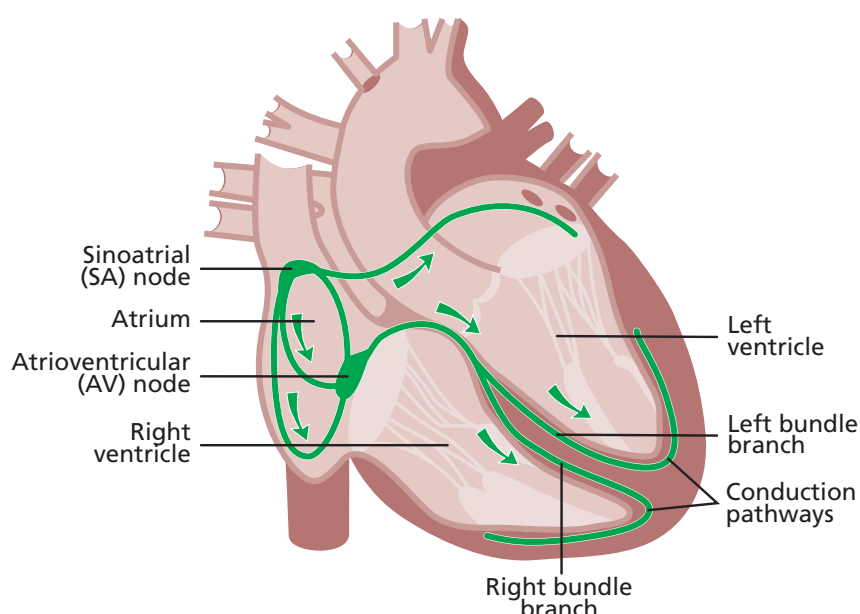
Normal resting heart rate ranges between 50 and 80 beats per minute for adolescents and adults but someone with IST will either have a resting heart rate of 100 beats per minute or more, or their heart rate will suddenly increase to over 100 beats per minute for instance when moving from a lying position to sitting. When asleep or at rest, their heart rate returns to normal.

What causes inappropriate sinus tachycardia?

There are many theories as to the cause of inappropriate sinus tachycardia (IST) and more research is needed to confirm the cause(s). One theory is that the sinoatrial (SA) node is abnormal in some way, or that the person is over-sensitive to the hormone adrenaline, which causes the heart to beat faster. It could also be caused by a disturbance to the autonomic nervous system – the part of the nervous system responsible for 'automatic' functions such as heart rate and breathing.

What are the signs and symptoms of inappropriate sinus tachycardia?

The symptoms of inappropriate sinus tachycardia are very variable and range from mild to severe. Common symptoms include heart flutters, shortness of breath and tiredness after even a small amount of exercise. Some people also feel weak, faint or dizzy when their heart is racing or beating fast. In most people, these symptoms come and go so there



are periods when normal day to day life is possible, but in others, the symptoms continue for a long time leading to reduced activity.

How is inappropriate sinus tachycardia diagnosed?

The doctor will take a clinical history – that is, what symptoms have occurred and how long they have been present – and carry out a physical examination. It can be helpful to keep a symptom diary of when the episodes occur and what activities happened beforehand.

They will usually order an electrocardiogram (ECG), which shows the heart rhythm. Sometimes it is difficult to record an episode when it is actually happening, so the doctor may suggest an exercise test or having an ECG over a 24-hour period. An electrophysiological (EP) study may be used to examine the SA node.

How is inappropriate sinus tachycardia treated?

Treatment is not always needed for inappropriate sinus tachycardia (IST), particularly if the episodes are fairly infrequent and not interfering with day to day life. If symptoms are more problematic, medicines such as beta blockers or calcium channel blockers may be suggested. It is important to balance the positive effects of the medicines against other side effects that they cause. Other new medicines are being evaluated like ivabridine which may be more helpful in the future.

Occasionally, ablation of the sinus node can be helpful, although in some cases the IST recurs or comes back. The doctor will use either radio frequency ablation or cryoablation on the affected area, which should stop the abnormal signals. Ablation works by using a targeted beam of energy to destroy the tissues causing the abnormal signals. Radio frequency (RF) ablation burns the area causing the abnormal rhythms and is effective in around 95 per cent of cases. An alternative method, cryoablation, is used where RF ablation is not suitable. Cryoablation freezes the affected area and is effective in about 80 per cent of cases, but is safer to use in certain areas of your heart.

This procedure is carried out at low risk and as a day case or with an overnight stay.

Other treatment methods that have shown potential benefit include cognitive behavioural therapy – a talking therapy that aims to change how a person reacts to and deals with difficulties such as the symptoms found in IST. This can include physical exercises such as deep breathing or stimulating the vagal nerve in the neck.

What happens next?

Inappropriate sinus tachycardia (IST) is not a life threatening condition although for some people it can have major effects on their day to day life. There is no proof that having IST increases the risk of other heart problems. In many cases, the treatments outlined above are successful although some people find that the symptoms come back every so often.

Further information and support

There are various organisations that can offer support and advice to anyone affected by inappropriate sinus tachycardia including:

- Arrhythmia Alliance – call their helpline on 01789 867501 or visit their website at www.heartrhythmcharity.org.uk
- Syncope Trust and Reflex Anoxic Seizures (STARS) – call their helpline on 01789 867 503 or visit their website at www.stars.org.uk
- Inappropriate Sinus Tachycardia Support UK (IST UK) have a Facebook™ page – search for IST UK