Sleep apnoea and cardiomyopathy

Cardiomyopathy UK
the heart muscle charity

The link between sleep apnoea and cardiomyopathy

- Sleep apnoea is a condition where a person's breathing is briefly interrupted during sleep.
- There are three main types of sleep apnoea, with different causes.
- Sleep apnoea can be caused by, or be a risk factor for, some heart conditions.

What is sleep apnoea?

Sleep apnoea is a respiratory condition where a person's breathing is affected during sleep, causing periods of paused (stopped) breathing. These episodes, where breathing stops, usually last at least 10 seconds each time, but can happen throughout sleep, hundreds of times. It is therefore a serious condition and can have a big impact on quality of life as well as health.

What are the symptoms of sleep apnoea?

The person themselves may not be aware of their breathing being affected during sleep. However, this is often identified by a sleeping partner, or if they experience symptoms in the daytime.

Typical symptoms during sleep include:

- repeatedly waking up abruptly;
- breathing stops during sleep, and starts again, often with a gasp;
- snoring (this is more common in OSA than CSA – see descriptions on pages 2 and 3).

This can be very distressing for a sleeping partner to witness.

The person may be aware of the impact of their sleep being disturbed, which can include:

- feeling unrefreshed on waking (feeling like you've not had a good night's sleep);
- feeling very tired during the day;
- feeling drowsy;
- having low mood and being irritable;
- waking up with a headache;
- finding it hard to concentrate; and
- frequently falling asleep during waking hours (sometimes called 'excessive daytime sleepiness').

The condition can also contribute to problems with relationships due to partners having constantly disturbed sleep

How is sleep apnoea diagnosed?

If you have suspected sleep apnoea, a number of tests may help to diagnose it. They may include the following.

- The doctor will usually start by asking you about how you sleep. For example, whether you snore or have periods when you appear to stop breathing. As you may not be aware of how you sleep, asking someone to watch you sleeping and tell you about it, or asking a regular sleeping partner to come with you to the appointment, can be helpful. They'll also ask about whether you feel sleepy, or drop off to sleep, during the day. They might give you tests to rule out other causes of tiredness.
- You might be asked to fill in an 'Epworth Sleepiness Scale' questionnaire, which looks at whether you have periods of sleepiness during waking hours. It asks you about the likelihood of you dozing during activities such as watching TV or sitting talking to a friend.
- If the doctor thinks you might have sleep apnoea, you may need to attend a sleep clinic. The clinic will usually look at your BMI (body mass index) to see if your weight or neck circumference are likely risk factors for you.
  You might be given equipment to monitor your sleep at home. This equipment will monitor your heart rate and breathing as well as the amount of oxygen you are getting during sleep.
  If more information is needed, you may need to have a polysomnography – which means sleeping at the clinic so that you can be observed, and various tests done while you sleep. This involves monitoring your heart and breathing rate, the amount of oxygen you are getting, as well as looking at your brain activity (electroencephalogram or EEG), and your muscle movement during sleep.

The information from these tests should confirm whether you have sleep apnoea or not, and what type you have. Results can also determine how severe it is, depending on how frequently breathing is affected (usually categorised as mild, moderate or severe). It can also identify treatment that might be helpful.

What is the impact of sleep apnoea?

Sleep apnoea causes interrupted sleep, which may cause tiredness and excessive sleepiness during the daytime, which can have a profound effect on the person's quality of life. It also causes fluctuating oxygen levels during sleep, which can increase the risk of developing other health conditions in people with no underlying conditions, or worsen conditions in people who already have them (see page 3).

Types of sleep apnoea

There are different types of sleep apnoea. Here we look at two types – obstructive sleep apnoea and central sleep apnoea – which can have implications for people with heart conditions.

Obstructive sleep apnoea (OSA)

This is the most common type of sleep apnoea, and is called 'obstructive' because it's caused by an obstruction in the throat (airway) that prevents the person from breathing.

In OSA, the throat narrows and relaxes during sleep, which causes it to collapse and block the person's airway. This might be a partial blockage (referred to as 'hypopnoea') or total blockage (referred to as 'apnoea'). The blockage affects the person's breathing, and happens repeatedly throughout the night. The fall in oxygen levels caused by not breathing triggers the brain to briefly wake the person to open their airway to breathe, before sleeping again. This is an unconscious action and the person is not aware of it happening, although it causes sleep to be disrupted.

Risk factors for OSA include:

- gender – more men than women have OSA, although it is not clear why;
- age – OSA is more common in people 40 years or older;
- lifestyle – smoking, and drinking before going to sleep, can both affect OSA;
- being overweight and having a large neck size (often said a collar size of greater than 17 inches) – this can affect the amount of tissue in the neck area which puts pressure on the throat muscles, and also can cause breathing difficulties;
- genetics – a tendency to have OSA may be genetic and run in some families;
- taking sedatives – medication that can cause sedation (such as sleeping pills);
- the menopause – changes during this time might affect the throat muscles so that they relax more than usual; and
- structure of the neck or nose - such as narrowed airways, large tonsils or tongue, or experiencing nasal congestion can affect OSA.

How is OSA treated?

OSA is usually treatable, and there are a number of options to consider. These may need to be used on an ongoing basis (if they treat the symptoms but do not change the cause of the condition).

- Lifestyle changes that address some of the risk factors above, such as reducing weight and avoiding smoking and drinking, can help reduce OSA.
- CPAP devices – this stands for continuous positive airway pressure. This device involves wearing a mask, which delivers continuous pressured air to maintain the airway and stop it collapsing during sleep.
- MAD – this stands for mandibular advancement device and is (like a dental gum shield). This helps to maintain a position of the tongue and jaw so that the airway is opened during sleep.
- Surgery – this is an option for some people who have a structural cause for their OSA, such as due to the structure of their neck or throat.

OSA and driving

If you have OSA that causes excessive daytime sleepiness that could affect your ability to drive (sometimes referred to as Obstructive Sleep Apnoea Syndrome), you need to stop driving. You will have to not drive until your OSAS is effectively treated (referred to as 'satisfactory symptom control'), which can be very soon after starting treatment such as using a CPAP device. Whether you will need to inform the DVLA will depend on the severity of your symptoms.

For more information about OSAS and driving see the driving regulations on the GOV website at www.gov.uk or the DVLA's leaflet 'Tiredness can kill' (visit www.gov.uk and search 'tiredness can kill').

Central sleep apnoea

Central sleep apnoea (CSA) is less common than OSA. Here the person appears to not make any effort to breathe and so no oxygen enters the body. This is sometimes referred to as 'lack of respiratory effort'. There are many possible causes of CSA, including:

- a problem with the part of the brain that controls breathing, which means that the brain stops sending the signals that instruct the muscles of the body to breathe. This is sometimes referred to as 'reduced drive to breathe'; and
- a weakness in the muscles that control breathing.

A lack of oxygen entering the body, coupled with carbon dioxide (a waste product of respiration) not leaving the body (in the out-breath) stimulates breathing to start again, but this cycle happens repeatedly throughout sleep.

This type of sleep apnoea rarely causes snoring.

What causes CSA?

CSA can be caused by problems in the brainstem (the part of the brain that controls breathing). For example, it can be caused by an underlying condition that affects the nervous system, which in turn affect the brainstems and the nerves leaving the brainstem.

Additional factors that increase the risk of developing this type of sleep apnoea include:

- gender – men are more prone to CSA than women;
- age – CSA is more common in older people, particularly over 65 years. This may be due, in part, to other medical conditions that they have;
- taking opioid medication that affects breathing and can increase the risk of CSA, such as morphine (used for pain relief);
- sleeping at high altitudes where oxygen levels are reduced (which resolves at lower altitudes);
- neurological conditions such as strokes or tumours which can affect the brain's ability to control breathing during sleep; and
- some heart conditions, including atrial fibrillation and congestive heart failure (where fluid has started to build up around the heart and lungs).

How is CSA treated?

How CSA is treated depends on the cause of the condition, and may include the following.

- Treating any underlying causes, including reducing any medications that cause or worsen the CSA.
- CPAP devices – this stands for continuous positive airway pressure. This device involves wearing a mask, which delivers continuous pressured air to maintain the airway and stop it collapsing during sleep.
- ASV (adaptive servo-ventilation) or BPAP (bi-level positive airway pressure) devices - these deliver pressurised air, similar to a CPAP device. However, these devices vary in the pressure at which they deliver oxygen, and can gives additional breaths if needed. (They may not be suitable for people with symptomatic heart failure.)
- Oxygen – having additional oxygen during sleep may help, and different devices to give this can be considered.
- In some cases medication can be used to help stimulate breathing if the devices above have not worked for an individual.

Complex sleep apnoea (or mixed sleep apnoea)

Complex sleep apnoea is a rarer type of sleep apnoea that is a combination of OSA and CSA. It occurs in some people with OSA when they start treatment of their OSA with a CPAP machine. During this treatment they develop symptoms of CSA despite their CPAP machine treating their obstruction.

Sleep apnoea and cardiomyopathy

Having an existing heart condition can be a risk factor for developing sleep apnoea. And sleep apnoea can also be a risk factor for heart conditions, worsening conditions in those who already have them, as well as increasing the risk of developing heart conditions in those without.

Sleep apnoea is a significant risk factor for high blood pressure and cardiovascular disease (conditions of the heart and blood vessels) including strokes and a heart attack. It can also cause arrhythmias (abnormal heart rhythms) such as atrial fibrillation. In people with existing heart condition, the repeated fluctuating oxygen levels can increase the risk of arrhythmias. Sleep apnoea can cause cardiovascular problems for the following reasons.

- The effort of trying to breathe in OSA can cause additional pressure on the heart to pump, which affects how well it works.
- The repeated sudden drops in oxygen levels that occur due to sleep apnoea can trigger an increase in blood pressure and heart rate (sometimes called the 'fight or flight response').
- Fluctuating in oxygen levels throughout the night, which can lead to the development of plaques in the blood vessels which can contribute to causing heart attacks or strokes.

Further reading about sleep apnoea

NHS Choices
www.nhs.uk/conditions/obstructive-sleep-apnoea
The Sleep Apnoea Trust
www.sleep-apnoea-trust.org
The British Lung Foundation
www.blf.org.uk

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