

Things that go bump in the night

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Those who experience tinnitus or sound sensitivity, or have a reasons for focusing on the ears or hearing, frequently complained of a variety of ear symptoms which may at first seem bizarre, and are sometimes misinterpreted by professionals. This short article is aimed at demystifying a few common symptoms, which often turn out to be everyday experiences, and not indicators of disease and dysfunction. They are also among the most common reasons for email to our website, and clearly a cause of concern to many.

Ear fullness and blockage

This is an extremely common complaint among patients with tinnitus and hearing loss, and may also occur on its own without any other symptoms. It may be continuous or intermittent. Most patients and quite a number of professionals assume that this symptom must mean there is a physical abnormality, in the outer or middle ear, causing a problem, and which needs medical or surgical treatment. Many people will have already been treated with ear syringing and decongestant tablets or nose drops, without any change in the symptoms.

Ear wax, don't knock it (in)

While this can be a cause of ear blockage it should be easy to diagnose using an auroscope, a small light and funnel for looking into the outer ear canal. All doctors and audiologists should be trained in its use, but skills vary very widely, to the point where some professionals have clearly never been able to visualise the eardrum. This has to be a sad comment on the importance attached to otolaryngology in the undergraduate training of some universities, particularly in Europe.

Ear wax is a natural part of the cleaning mechanism of the ear, and normally falls out of the ear in small quantities combined with pieces of dead skin. However the common practice of cleaning down the ear with flannels, corners of towels and cotton buds

often pushes the wax down the ear canal against the eardrum where it forms an immovable bullet. Naturally the first thing to check is whether ear wax is blocking the ear canal or not. Frequently not! If it does, syringing with warm water by a trained person is still best, simplest, and safe.

Middle ear blockage, not always what it seems

Behind the eardrum is an air-filled space where three little bones conduct the sound to the cochlear or inner ear, when the eardrum vibrates. The air is replenished through the Eustachian tube every time we swallow or yawn, something most people have experienced on air flight. Many patients come to us with a conviction that they have Eustachian tube blockage, and this will have been reinforced by professional diagnosis in the absence of any investigation. It is very easy these days to measure Eustachian function with impedance audiometry. A soft earplug placed in the outer ear connects with a device which measures the pressure behind eardrum. In over 97% of our tinnitus patients this proves to be the same as atmospheric pressure, indicating that the Eustachian tube is functioning normally. Nevertheless many patients have been treated for Eustachian dysfunction even though they didn't have it. Do not accept a diagnosis of persistent blocked Eustachian tube without this test.

Eustachian blockage no longer such a common problem

Concepts about Eustachian tube blockage, particularly in complimentary medicine, are generally very out of date, and reflect the common clinical findings in pre-antibiotic days, when chronic infection of the throat and sinuses was commonplace. In those societies where children are given regular courses of antibiotics, and live in good housing, such chronic infections are now a rarity, compared with the high prevalence of these symptoms. Consequently Eustachian dysfunction after childhood (when glue ear is common) is now rarely seen. In any case, impedance audiometry, taking some 30 seconds to perform, gives the answer.

The tensor tympani syndrome.

This muscle in the middle ear which is attached to the back of the eardrum has no useful function. At a time when the eardrum was nearer the surface of body, it may well have been useful as a "blink reflex" to tense the eardrum when an animal was fighting. Certainly a variety of stimuli, such as tapping on the face or blowing on the eyeball can make it contract in humans. From a developmental point of view it is really one of the face muscles, from which it has migrated. It is easy to see how the tensor tympani might contract, in the same way that the eye might blink, during attack. This muscle may also increase in tension when there is a generalised increase in muscle tension with stress, or anxiety about ear symptoms. Again impedance audiometry can measure increased contractions of this muscle, and help with the diagnosis.

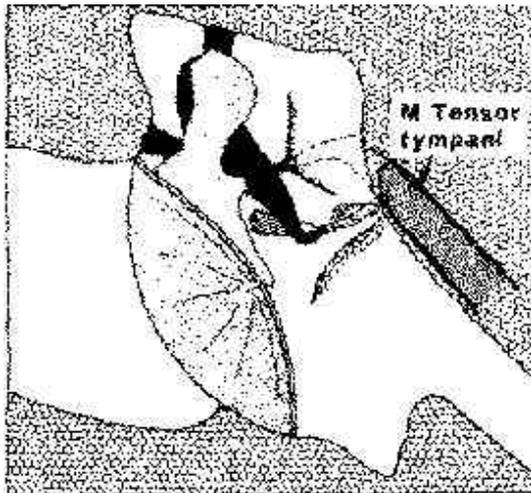


Diagram of tensor tympani muscle

Insects in the ear

When the tensor tympani muscle contracts, it pulls the eardrum inwards slightly, so that a feeling of blockage can also be associated with a genuine feeling of eardrum movement. Just as facial muscles can contract, they can also twitch! Most people are familiar with twitching muscles in the corner of the eye, very often when under stress. This may be greatly exaggerated in some people and become what is called a

facial tic. If the tensor tympani muscle is affected in the same way, the twitching produces a sensation of fluttering of the eardrum, rather like having a small insect in the ear. Again, most people that you ask will have had this experience at some time or another. If it occurs frequently and in combination with other ear symptoms, it naturally causes concern, even though it is not part of a disease process.

In most cases the increased muscle activity is caused by a general increase in tension (autonomic activity), which may be part of a reaction to tinnitus, or to other stressful events. This means that improvements in these other conditions, combined with relaxation techniques can reduce the muscle tension and twitching. This was first described by Klockoff in his original paper on the tensor tympani syndrome. We estimate that over 40% of our patients at the tinnitus and hyperacusis centre in London complain of, or remark on, symptoms relating to the tensor tympani muscle.

Just as with tinnitus, conscious experience can be enormously enhanced by a process of focusing on what is considered to be a negative event. Reassurance about the mechanism of these ear symptoms often results in their disappearance. In my career I have only found it necessary to perform surgery to cut the tensor tympani muscle to provide relief of symptoms caused by it, in 10 cases. However this relatively simple procedure remains an option for those who do not respond to conservative management.

Other muscle activity

A much less common cause of ear symptoms is palatal myoclonus. In this condition, irregular clicking sounds emanate from the ear and may be heard by others. This is caused by tic-like contractions of the muscles of the palate, forcibly opening the Eustachian tube and producing a click from the wet surfaces of the tube separating suddenly. Again the condition is quite harmless, but the clicks can be intrusive and we have known of cases in children where sleep-over guests were kept awake! In troublesome cases specialist management is advised.

Jaw joint dysfunction

Part of the body's defense mechanism is to increase tension in muscles, when under attack by internal or external elements. With any ear problems, powerful neck muscles attached behind the ear to the mastoid process, often going into spasm causing pain in and around the ear. Often these muscles will feel tender to touch because of prolonged spasm. Jaw joint muscles can also go into spasm, causing pain and dysfunction in the joint. It shares a nerve supply with the ear canal, causing pain to be referred into the ear. **This is the commonest cause of ear pain and earache in adults.** It often accompanies tinnitus and tensor tympani syndrome, and no one can be blamed for wrong-thinking that there is some acute infection causing the whole problems. Strongly held wrong beliefs about what is going on in the ear cause more distress than anything else.

About 60 years ago a dentist called Costen thought that tinnitus was caused by jaw joint dysfunction. Many centres still use his ideas as a treatment for tinnitus. Understanding the mechanism shows how the two may be associated, but without a direct connection.

Somatosounds

Somatosounds simply means body sounds. We hear these all the time when our tummy rumbles, or we swallow and our ears click. In fact the head (and the body) is a very noisy place. The head has constant loud pulsations from blood vessels around the brain, and from the carotid artery which passes about 6 mm from the cochlea. Frequently, normal heart sounds are conducted up this artery to the inner ear. If you want to hear them, borrow a stethoscope and listen to your own heart! In addition joints and muscles around the ear and in the head make constant sounds, as does the normal Eustachian tube, and the sound of air passing through the nose, over the end of the tube. Transmitted sounds of the normal heart beating can also be heard easily with a stethoscope placed on the neck. All these sounds can be heard clearly by listening with a small microphone placed in the outer ear canal of a normal subject,

proving that they should be there!

There is rarely anything wrong

Despite the head being a noisy place, very few people hear these sounds on a daily basis, and even fewer are distressed by them. However just as tinnitus can become audible due to compensatory changes in the auditory system, or changes in environment or stress, so body sounds, previously selectively blocked by the brain, can become enhanced and even very loud. Somatosounds become troublesome in the same way as tinnitus does; check out the Jastreboff model. The sequence is as follows. Someone becomes aware of a body sound, which in the vast majority of cases is the result of normal function, which has always been there (blood flow etc.). They become worried that something HAS gone wrong, and focus on the sound, directing auditory filters to amplify it (just like tinnitus). What increases is the perception of the sound, not the generator, and also an aversive reaction to it, which causes the distress.

Reversing the process

By the same token, retraining is essential to make the sound disappear from consciousness, once the negative associations are lost. Naturally this requires proper examination by a specialist to allow reassurance to be given. Specialists who are convinced that somatosounds must mean there is a body abnormality responsible, and do not believe in Jastreboff's model, cannot always reassure patients when it is needed. Some people cannot believe that the auditory system is capable of such complex activity, but the Jastreboff model explains why and how, and in simple language with illustrations that all can understand. Of course it is always possible that some somatosounds do indicate benign changes in head / body function, but these can almost always be fixed, if necessary, and account for only a few percent of those troubled by somatosounds.

Teeth clenching, head movement and other triggers

A common reason for people to worry about tinnitus being a disease related event, is the ability for it to change predictably with simple events like teeth clenching, head or eye movement, touching parts of the face etc etc. Recent research has confirmed the presence of powerful connections between skin and muscles, particularly around the head, and the auditory pathways where sound is processed before it is perceived. It is likely that the auditory system uses this information in the subconscious brain to help with sound location, or to enhance perception in event of danger and attack (could the animal be snarling?). In addition facial and chewing muscles share a motor nerve with middle ear muscles, and this could also change or attenuate hearing in a way that would temporarily alter tinnitus and somatosounds. Teeth clenching in a quiet room allows almost everyone to hear tinnitus! If you have loud tinnitus already, the effect will be much more pronounced.

Information is the key

Understanding what is causing these experiences gets rid of the problem in the majority of cases. Often only unresolved anxiety is keeping the symptoms going. A much greater awareness about somatosounds, and the tensor tympani syndrome is needed among professionals who deal with tinnitus and hyperacusis patients on a daily basis.

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