RINGING THE CHANGES:

The 2 main problems which seem to affect arachnoiditis patients most commonly are:

1. Tinnitus
2. Hypersensitivity to noise (hyperacusis)

Tinnitus:

This term refers to noises heard ?in the ears' or ?in the head' which don't come from an external source.

- Buzzing
- Ringing
- Whistling
- Hissing
- Pulsing

There may also be heightened sensitivity to external sounds: hyperacusis. In particular, this tends to involve outside sounds which resemble those of tinnitus.

About 60% of people with persistent tinnitus are affected by hyperacusis.

Who gets tinnitus and why?

Brief episodes of tinnitus often happen, e.g. listening carefully in a quiet room.

90% of the population experience this phenomenon.

10% of the population have persistent tinnitus, which involves the part of the brain concerned with analysing sound signals, focusing on weak signals. It is NOT usually an ear problem.

There is a distinct association between the development of persistent tinnitus and stressful events such as bereavement, family stress etc.

Persistent tinnitus often involves significant feelings of anxiety and depression, with a perception that this is yet another problem for which there is no solution. The traditional medical view of tinnitus rather supported the viewpoint that there was no curative treatment, because it focused on irreversible damage to the ear.

A more recent model, the Jastreboff model suggests that in fact, tinnitus and hyperacusis are due to hypersensitivity of the subconscious part of the brain which picks up low intensity signals from the ears.

In arachnoiditis, the central nervous system as a whole tends to become hypersensitive and this may heighten the perception of tinnitus.

Indeed, tinnitus and hyperacusis may well simply be a facet of this overall hypersensitivity.

Ear problems?

Of course, it is important to have any correctable hearing deficit treated. Simple hearing tests and an ear examination by the GP can rule out problems such as wax or glue ear.

Less than 5% of cases of tinnitus have an ear condition (it tends to be mild age-related hearing impairment). The other causes which need to be excluded are:

1. Menieres disease (see above)
2. High blood pressure
3. Overactive thyroid
4. Raised intracranial pressure (e.g. Pseudotumour cerebri: a very uncommon condition): occasionally, arachnoiditis sufferers have features suggestive of high intracranial pressure, but these may well be transient. The usual symptom is pulsatile tinnitus (a whooshing sound like a pulse in your ear).
5. Salicylate use: some patients react to painkillers such as aspirin and other similar preparations which contain salicylate. Salicylates also occur naturally in various fruits.

Note: caffeine, alcohol and nicotine are all associated with tinnitus.

Retraining

The Jastreboff model is as yet unfamiliar with many medical practitioners. The basic tenet of this model is that tinnitus is not an ear problem, but a brain one, and that retraining this part of the brain is feasible: this is known as Tinnitus Retraining Therapy.

The goal of this therapy is to habituate the patient to the tinnitus.

The first vital step is to understand that the subconscious parts of the brain which act as ?filters' and which focus on weak electrical signals from the inner ear need to be retrained. This is NOT to suggest that tinnitus is a psychological problem.

However, it must be noted that psychological distress (anxiety, agitation, anger) often accompany tinnitus: these emotional responses are targeted in the retraining strategy.

Retraining (habituation) therapy differs considerably from ?conventional' tinnitus treatment, which has primarily involved devices such as a ?masker' which emit white noise (sounds like surf).

Maskers may be used as a secondary line of treatment in retraining, at a low level, not to mask or exclude the tinnitus by rendering it inaudible, as in conventional use of the device, but at low levels to help effect changes in the subconscious hearing system.

In any case, full blown masking to totally suppress tinnitus is only effective in 30%.

Using masking at a low level to reduce the contrast between complete silence (when tinnitus can naturally ?emerge' in anyone) and also to distract somewhat, can be a useful part of retraining.

Dispelling myths:

Tinnitus does NOT cause deafness. An RNID (Royal National Institute for the Deaf)study has found that tinnitus patients have the same level of hearing as other people.

However, having a hearing loss which is not treated appropriately (e.g. with the necessary hearing aids) is likely to lead to troublesome tinnitus (about twice as likely).

Tinnitus will NOT drive you mad.

It is NOT a harbinger of doom: a brain tumour, blood clot etc.

It will not necessarily get louder.

Tinnitus is NOT something that is to be feared.

What sound means to us:

Hearing in animals has developed into a highly specific sense which is vital for self-preservation and for predators, as a tool for successful hunting (and thus, survival).

Whilst our hearing is by no means as sensitive as that of a dog, for example, it is nevertheless highly responsive to all sorts of noises, loud and quiet.

Being alone in an old house, at night, with only the tick of the clock to listen to, we would all become very alert to the slightest creak or thud.

Years ago in my childhood, I remember waking one night and hearing a tapping sound. It persisted, and my imagination started to work. What if it were something trying to get in to the house? I got up and went out of my bedroom onto the landing, where I could hear the tapping more distinctly.

It was coming from the bathroom, a regular tap-tap-tap. By now, my heart was thumping in my chest, but I plucked up the courage to throw open the bathroom door, to find...an open window and the blind tapping against the glass in the breeze!

Needless to say, feeling rather foolish, I retired to bed. The noise continued, but no longer held any terror for me.

Later, when I was a medical student in London, I was woken up suddenly one night by an enormous, overhead thunderclap. I had obviously slept through the storm's progression, until then.

Being woken so abruptly and noisily, my body reacted strongly, my adrenaline levels shot through the roof, and my heart was pounding so much, I thought it would jump out of my chest, and I'd look down to see it pirouetting around the floor!

Sleep evaded me for the rest of that night.

Thankfully, I haven't gone on to fear thunder.

The point of these rather silly stories is that sound causes a physical response in our bodies: the autonomic nervous system reacts, in particular to sounds that might signal ?danger'.

This response to extreme noise, with the sympathetic nervous system in full swing, is likely to provoke an emotional response: fear or anger (or even both!). This in turn, may be stored as a memory and later, similar noises interpreted accordingly. Our perception of sound can altered by our emotional response.

We cannot stop tinnitus occurring, but we can alter our emotional response to it.

Another pertinent example which will be familiar to all parents: as mothers of young babies, we can sleep through all sorts of noise, but if the baby stirs and whimpers, we are awake in an instant.

I still wake up (despite medication) the instant my 6 year-old daughter comes into our bedroom at night, even though she is silent. So we are finely tuned into some noises, however slight.

Talking of babies, nowadays, young mums are advised to let the baby go to sleep in amongst daily activity, so that he/she becomes accustomed to falling asleep despite the washing machine, the dog, other siblings, the radio etc. (even the hoover in some cases!).

This means that the baby doesn't need total peace and quiet to have a nap: something that in this day and age, is hard to find! This is a type of early ?habituation'.

Imagine your favourite auntie has bought you a hideous painting; she's a regular visitor, popping in at a moment's notice. You have no choice but to hang it up somewhere.

It hangs there on your wall, day in day out. You are most likely to start to ignore it.

Eventually, you ?forget' it is there. The picture hasn't moved, nor has it got any prettier, but you tolerate it to the point where you are ?unaware' of its presence.

This is another example of habituation.

We all practice habituation of one sort or another without realising it.

How does this fit in with tinnitus? Well, if one considers the noise of tinnitus as a-n-other sensation, and divorce it of its emotional connotations, we are likely to be better able to cope with it.

It is vital to appreciate that it is NOT the tinnitus itself which causes distress, but our reaction to it. (and, again, this is NOT to suggest that the tinnitus itself is a psychological problem).

The sound of silence

Tinnitus is, as per the Simon and Garfunkel song title, ?the sound of silence': which is why it is often worst at night when we have nothing else to distract us from it.

I recall the silence of the countryside at night being almost painful when I was staying with my parents in Devon as a break from a busy job in London.

My ears had become so accustomed to constant noise, day and night, that the incredible, virtually tangible silence in Devon seemed almost overwhelming.

Silence is not golden:

One of the strategies people often use to combat tinnitus is to use ear plugs.

This is absolutely the worst thing one can do because it makes the parts of the brain which pick up weak signals become even more sensitive.

People affected by tinnitus should not seek out silence, but should avoid it.

If there is hypersensitivity to sounds, then silence seems an attractive alternative;
however, one should still avoid extreme silence.

The goal is *sound enrichment*: use of pleasant, non-intrusive background sound.

This may be something like opening the window, pleasant, quiet music, devices which produce sounds like the sea, rain etc.

Trying to blot out tinnitus with white noise/radio/loud TV is NOT recommended.

Retraining in arachnoiditis patients.

In a sense, retraining therapy would seek to reverse the process by which arachnoiditis has caused central sensitisation; the problem arose through a process called *plasticity*, which is the nervous system's capacity to change due to constant bombardment of signals, such as pain.

As I explained earlier in this article, it is as if the entire system has been ?reset' to be much more sensitive.

What retraining involves:

1. a thorough examination by an ear specialist
2. development of a full understanding of what happens in the ear and the brain to cause tinnitus
3. correction of any hearing loss*
4. acceptance that the sounds of tinnitus are natural sounds and it is our interpretation of them which makes them seem distressing *habituation of reaction*: the initial stage of retraining *habituation of perception:* tinnitus becomes quieter and eventually disappears or becomes part of the natural background ?sound of silence'.

Retraining therapy takes time, about 2 years.

- hearing loss will cause a tendency to strain to hear, thereby increasing the amplification of sound signals, increasing the sensitivity of the brain and thus the ease with which tinnitus is picked up.

N.B. Retraining (habituation) can only be effective if the tinnitus is perceptible; so maskers/strategies such as leaving the TV on loud all the time, which render tinnitus inaudible, are counterproductive.

Tactics

1. listen to tinnitus (or unpleasant external sounds if you have hyperacusis) for short periods each day (very gradually extending the time): only whilst you do not experience an unpleasant reaction (perhaps 10 seconds to begin with).

   This should be done 10 times a day only. The rest of the time you may find you react as before, with distress (anger/frustration/feeling upset)

2. try to identify your emotional and body reaction to this sound and try to reduce it a little each time. Don't try to overdo this (?flooding' techniques which expose you to too much unpleasant experience at once can make things worse) As with desensitisation to an allergy, progress will be slow

   and steady. (may take 18-24 months)

3. think positively about tinnitus: it is a natural sound
4. reduce the impact of tinnitus/unpleasant external sounds by sound enrichment.

Results:

A study at the London Tinnitus and Hyperacusis Centre showed that 83.7% of patients showed a 40% or greater improvement.

Useful contact:

Royal National Institute for Deaf People (RNID) supports a helpline in
Nottingham; for advice from trained advisers on all aspects of tinnitus,
and referral to local service and support groups:
Monday-Friday 10am-3pm 0345 090210 (local call rates in UK).