PARKHURST EXCHANGE ROUND TABLE DISCUSSION, 2009

"Taming Tinnitus"

Tinnitus is a common problem that's often frustrating for those afflicted and their doctors. The relentless ringing in the ears can drive patients to despair, depression or even suicide — yet too many clinicians inadvertently feed into this downward spiral by telling them that "nothing can be done" and they'll "just have to learn to live with it." Our panel of experts dispels these myths and explains exactly what family physicians can do to help patients achieve peace of mind.

BIOS: Deborah Lain, BA, MSc is a registered psychologist at SoulSpring Counselling in Calgary, AB. She has developed a specialization in the psychological management of tinnitus and offers a program designed to teach patients self management strategies.

Glynnis Tidball, MClSc (Aud) is an audiologist in the tinnitus clinic of the Rotary and Westcoast Hearing Clinic of St. Paul's Hospital in Vancouver, BC, where she provides tinnitus retraining therapy.

Brian Westerberg, MD, FRCSC is a clinical associate professor of otolaryngology at the University of British Columbia and otologist/neuro-otologist at the Rotary and Westcoast Tinnitus Clinic of St. Paul's Hospital in Vancouver, BC.

PE: What is tinnitus and what causes it?

Dr. Westerberg: Tinnitus is usually a subjective sensation of hearing a sound in the absence of an external source. It's typically a simple, meaningless noise, such as ringing, humming, buzzing, clicking, roaring, or chirping.

In general, we divide tinnitus into pulsatile and nonpulsatile types. Pulsatile tinnitus sounds like a heartbeat in the person's ear and can often be heard objectively with a stethoscope. Nonpulsatile tinnitus is far more common; it's almost always subjective and associated with hearing loss.

Tinnitus is fascinating from a scientific point of view — though it's often extremely frustrating for patients. A study in which medical students were put in a quiet room and asked what they heard showed that virtually everyone will have tinnitus if they really listen for it.

Most tinnitus is probably just normal physiologic signals or sounds. For example, the sound-detecting hair cells in our inner ears are so sensitive that they will respond to the movement of a single water molecule beside them. Most of the time, the brain filters this out as nonsensical noise, but in some people, for reasons that aren't well understood, the filter mechanism seems to go awry and the brain starts paying attention to it. Some

patients with severe tinnitus have actually had their auditory nerves cut, but most of them still hear it — so it's likely a phenomenon originating in the brain, not the ears.

Ms. Tidball: There's tinnitus, and then there's the reaction to it. The meaning attached to the tinnitus determines how people respond to it, not the pitch or loudness. For example, if you're afraid the tinnitus is a sign of a serious medical problem, like a brain tumour, the brain will interpret it as an alarm sound needing a response, and will keep bringing it to your attention, even magnifying it.

Ms. Lain: The distress experienced with Tinnitus isn't the result of a single isolated event. To see it that way would be like trying to understand stress without looking at the stressors.

Triggers or concurrent factors that can affect people's ability to cope with tinnitus include cultural, physical and personality characteristics; chronic medical conditions, associated hearing loss and/or other ear disorders; life cycle changes like retirement, divorce or moving; traumatic events, such as motor vehicle accident or head injury; and a history of previous emotional concerns, including anxiety or panic disorders, depression, trauma or abuse, poor family support and financial stressors.

PE: What should the initial workup include?

Dr. Westerberg: For the history, the questions we'd typically ask to determine the nature of the tinnitus are:

- Is it Pulsatile or not?
- Is it in one ear or both?
- Did it come on suddenly or gradually?
- Is it associated with hearing loss or balance problems?
- Did it begin after a loud noise exposure?
- Did it start after a head injury?
- What medications are they taking?

Keep in mind that tinnitus is listed as a side effect of almost every drug. Part of the problem is that nearly everyone has tinnitus at some point, and sooner or later it coincides with using a medication. That said, the major drugs associated with tinnitus are the aminoglycoside antibiotics like Gentamicin, which are ototoxic. Overdosing on aspirin or other nonsteroidal anti-inflammatory drugs (NSAIDs) can also cause or aggravate tinnitus.

As part of the physical examination for nonpulsatile tinnitus, you'd want to make sure the eardrums are healthy, and send the patient to an audiologist for a hearing test. For pulsatile tinnitus, we'll usually use a stethoscope to listen to the neck, in and around the ear, and even the heart, to pick up murmurs that could be transmitted to the ear.

Some people recommend vitamin B_{12} and thyroid function tests, particularly if there are balance issues, but most tinnitus is physiologic or associated with hearing loss, so I don't routinely do blood work.

Ms. Tidball: To find out if tinnitus patients might have hearing loss and could benefit from an audiologic assessment, ask:

- Do others complain your TV is too loud?
- Does your family say you don't hear well?
- Do you find people mumble?
- Do you have difficulty hearing in restaurants?

Family physicians (FPs) should also ask if these patients have ever worked around significant noise, as they could be eligible for worker's compensation, or whether they're veterans, since Veteran's Affairs covers not only hearing loss, but also tinnitus.

Ms. Lain: FPs are likely the first medical professionals patients will see about ringing in their ears. Patients will probably also tell them how the tinnitus is affecting their lives, which could include emotional, cognitive, social, relationship, occupational and physical impacts. That's why it's crucial for a comprehensive treatment approach to include not only medical and audiologic assessment, but also evaluation of the patient's overall psychologic functioning.

PE: What are some indications for referral?

Dr. Westerberg: Pulsatile tinnitus could be a sign of malformed blood vessels in or around the ear, certain types of tumors that can arise in the ear, or narrowing of arteries in the neck. We'd often do a computed tomography (CT) scan with contrast, since it provides a better picture of the bone surrounding the ear, which is where Pulsatile tinnitus often arises. But in the vast majority of people with Pulsatile tinnitus, we don't find a cause — it's probably just the sound of turbulent flow in large blood vessels in and around the ear.

Nonpulsatile tinnitus in one ear only and associated with hearing loss may be a sign of acoustic neuroma. To rule this out, we'd usually do magnetic resonance imaging (MRI) to examine brain and nerve tissue.

Ms. Lain: There are four main concerns for the FP in assessing psychologic functioning: significant impairment shows up as recognizable symptoms of depression, anxiety, sleep disturbance or suicidal ideation. Unless they have a prior psychiatric history or are suicidal, most patients wouldn't need to see a psychiatrist.

It's important to recognize when someone requires skills that may be beyond the scope of the usual supportive doctor-patient dialogue. Consider psychologic intervention for:

- ongoing moderate to severe emotional distress, including symptoms of depression or anxiety that interfere significantly with overall functioning
- extremely negative and distorted thinking which is directly linked to negative emotional states

- inability to concentrate or work, limiting of activities or increased avoidance and withdrawal behaviors
- increased stress or conflict in their marriage, family or other relationships because of the tinnitus, or lack of support network
- concurrent factors or stressors, such as life cycle changes, or death in the family

The challenge is to ensure patients understand the value of the FP recommending a psychologist without thinking they're being told "it's all in your head." To address this stigma, doctors need to be able to say with confidence, "It isn't in your head — it's very real, but in addition to the sound itself, the tinnitus is creating significant emotional distress and influencing the quality of your life." " Stress is known to aggravate all medical conditions, and learning the tools that can help you decrease the impact of the tinnitus, will help you to feel more self-control, versus the tinnitus controlling you."

If patients spend considerable time telling you how difficult their lives have been since getting tinnitus, it's a sign that a psychologist could help. A psychologist can teach people coping strategies and help them improve their quality of life — even though the sound itself may not change. Tinnitus is a good example that we can't just focus on physical manifestations of a condition, but must also look at psychologic health.

PE: What's the link between hearing loss and tinnitus?

Dr. Westerberg: In some respects, tinnitus is very similar to phantom limb pain, where people who've lost an arm or leg will still have sensation in the missing limb. Likewise, tinnitus often develops in people with hearing loss and tends to arise at a frequency that's consistent with the frequency range they're missing.

Even patients with tinnitus whose hearing seems normal may have some form of hearing loss. Audiologists typically only test hearing in the speech range, from 250 to 8,000 Hz, so these people might have hearing damage above 8,000 Hz that isn't being measured. Also, our standard hearing tests are pretty crude — they're unlikely to pick up subtle changes.

Ms. Tidball: Hearing aids can be very helpful to manage tinnitus in people with hearing loss — even if it's barely noticeable and wouldn't warrant hearing aids on its own. Some patients can't hear their tinnitus at all when they're wearing hearing aids, while others find they just take the edge off the sound. Another group won't notice any difference in the short term, but will benefit in the long term: if tinnitus is the brain's way of compensating for a lack of sound input, then hearing aids should prevent the problem by bringing in more sound.

Many people with tinnitus also have sound intolerance or hyperacusis — they can't tolerate moderately loud or sharper, high-pitched sounds, such as children screaming or cutlery rattling. If these patients also have hearing loss, they should see a hearing-aid dispenser or audiologist who's familiar with fitting hearing aids for people with all three conditions. When people have sound intolerance, we need to gradually work our way up to the right amount of sound.

PE: How does tinnitus become a problem for some people?

Dr. Westerberg: It's human nature to pay attention to things we worry about. I remember seeing an elderly woman who had been mugged in a park. She had gotten a blow to the head that made her ears ring, but afterward she was left with persistent tinnitus. Obviously, being mugged is psychologically traumatizing, but she was dealing with the tinnitus as well. Once she was able to work through the emotional issues, the tinnitus went away.

Ms. Tidball: As long as you have a very strong reaction to the tinnitus, your brain will bring it to your attention. You can only pay attention to one thing at a time, and your brain chooses what's most important. So, if your brain has determined that the tinnitus is the most important, that's what you'll focus on. With tasks like reading, or if you're having trouble hearing something, the tinnitus will even tend get worse as your attention keeps returning to it.

Ms. Lain: A vicious circle of emotional distress can be set off by negative thoughts, such as "I can't stand it," "Why did this happen to me?" or "No one can help me." Sufferers start to think: "I can't do anything anymore," "I can't go to work" — a lot of can'ts, which in turn leads them to withdraw and isolate themselves from other people. This can also strain relationships with loved ones, who may become resentful. Patients end up feeling angry, depressed, anxious, lonely, and helpless. Physically, they may begin to show the signs of long-term stress: sleep problems, neck or back pain, stomach aches, and headaches.

PE: What are the key treatment approaches?

Dr. Westerberg: The worst thing you can say to someone with tinnitus is "Nothing can be done" or "You'll just have to live with it" — it's very counterproductive and can take forever to undo. Granted, because it's a normal physiologic process, there's no pill or operation that can just make the tinnitus go away, but there are many helpful options.

Once you've ruled out the serious medical conditions, the vast majority of people just need to be reassured their tinnitus isn't a sign of anything ominous. My goal is to convince patients it's not something important they need to focus on, so eventually their brains will filter it out and the sound gets quieter over time. It's essential to be positive with patients and always reassure them that it will get better.

Ms. Tidball: For tinnitus that continues to interfere with everyday activities, tinnitus retraining therapy (TRT) can be very effective. TRT isn't a cure for tinnitus, but it can get patients to the next-best place: the tinnitus is still there, but most of the time they're not aware of it; and if they do still notice it, it doesn't bother them.

TRT trains the brain to gradually tolerate the tinnitus, through a combination of education about the condition and "sound enrichment," which involves being exposed 24/7 to a bland, background sound. It's essential to still be able to hear the tinnitus, or else the brain can't get used to it. For many people, fountains or inexpensive sound therapy machines producing nature sounds like "ocean waves" or "waterfalls" work well. Those with more severe tinnitus or hyperacusis might need in-ear noise generators.

About 80% of people receiving TRT will benefit from it — they're less aware of the tinnitus, have lower stress and participate more in usual activities.

Ms. Lain: Addressing the emotional impact of tinnitus is an often-neglected component of treatment. The goal of cognitive behavioral therapy (CBT) is to get people to recognize the crucial link between their *thoughts* about their tinnitus and the resulting *feelings* of emotional distress. By questioning the validity of these thoughts, they can create healthier emotional and behavioral responses, and regain a sense of control over their lives. A recent review of six clinical trials of CBT for tinnitus concluded this therapy significantly boosts people's quality of life (*Cochrane Database Systematic Rev* 2007 Jan 24;[1]:CD005233).

PE: What's the role of medications in managing tinnitus?

Dr. Westerberg: Antidepressants can be helpful when the emotional reaction to the tinnitus is quite strong. For some patients, the antidepressant seems to help not only the mood, but also the tinnitus itself. We try to avoid sedatives, as they tend to be counterproductive in allowing patients to adapt to the tinnitus.

Ms. Tidball: It's also surprising that benzodiazepines are prescribed for people with tinnitus, because withdrawal from these sedatives can actually trigger this symptom.

Ms. Lain: Another reason why benzodiazepines should be prescribed with caution is their addictive properties: patients could be in so much despair they might abuse this type of drug to "escape" the distress by self-medicating. Many antidepressants can aid in sleep, as well as being anxiolytic, so they're a safer alternative. But in severe cases, a short course of alprazolam or lorazepam, or the short-acting sedative zoplicone, could be used to get someone through a crisis.

However, this can't be the only coping strategy! Medication won't teach patients how to cope with their condition. This is where a referral for a psychologist would come in who can empower the patient to believe that there is hope beyond "living with it"; they can learn to live again, while having it.

Resources

Tinnitus Association of Canada (www.kadis.com/ta/tinnitus.htm): offers patient-oriented resources, including listings of support groups and audiologists who provide TRT

British Tinnitus Association (tinnitus.demonweb.co.uk): has extensive information for health professionals and patients

The Tinnitus and Hyperacusis Centre, London, U.K. (www.tinnitus.org): was set up by Jonathan Hazell, one of the codevelopers of TRT; has in-depth information on the theory and practice of TRT, including exercises for patients