

# Human immunodeficiency virus and hearing impairment

BY YOLANDÉ VAN DER WESTHUIZEN

With an estimated 36.7 million individuals living with HIV / AIDS and literature reporting that these conditions contribute to hearing loss, it is surprising that more focus and resources are not employed to tackle this major hearing health concern. **Yolandé van der Westhuizen** discusses how common hearing loss is in HIV / AIDS and what causes it.

**A**cquired immunodeficiency syndrome (AIDS) resulting from the human immunodeficiency virus (HIV) is a devastating pandemic, affecting the lives of millions of individuals across the world. Since the initial report of AIDS in 1981, more than 35 million people have died from it, while an estimated 36.7 million (and growing) continue to live with HIV / AIDS as a chronic condition.

Head and neck manifestations, including auditory and otological symptoms, occur commonly in HIV / AIDS infected individuals. Reported symptoms include otalgia, vertigo, tinnitus, pruritus of the ear canal, otorrhea and hearing loss. Various mechanisms of auditory dysfunction in HIV / AIDS have been proposed. These include the following:

- **The direct effects of the virus on the central nervous system and eighth cranial nerve**

Several post-mortem studies indicate central nervous system (CNS) involvement in up to 90% of individuals who have HIV / AIDS. Children are often more susceptible to CNS involvement due to immature immune systems. Frequent occurrence of abnormal auditory brainstem response (ABR) findings suggests compromised neural integrity and may, in addition to hearing loss, also result in early auditory processing disorders. The exact mechanism of CNS destruction is, however, not clear at this stage, although some studies link cortical demyelination as a potential cause thereof.

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- **Opportunistic infections commonly associated with hearing loss**

Otitis media, cholesteatoma, otosyphilis, cytomegalovirus, herpes zoster virus, toxoplasmosis and meningitis. These opportunistic infections can cause conductive hearing loss, sensory hearing loss, neural hearing loss and mixed hearing loss.

- **Ototoxicity as a result of highly active antiretroviral treatment (HAART)**

Various antiretroviral (ARV) therapies have proven to cause ototoxic hearing loss, possibly due to damage to the mitochondrial DNA. A higher prevalence of ototoxic-induced hearing loss with the use of nucleoside reverse transcriptase inhibitors (NRTI's) has been reported, whilst possible drug interactions should also be considered.

- **Ototoxicity as a result of medication administered in the treatment of opportunistic infections**

Due to the immune-compromised condition of the patient, recurrent and multiple opportunistic infections are common, which often results in treatment with medication with known ototoxic effects. This puts the HIV-infected individual at a significantly increased risk for ototoxic-induced hearing loss. Tuberculosis, for instance, is a very common opportunistic infection and requires - particularly for the multidrug resistant strains - high dosages of antibiotics, such as streptomycin, which is potentially devastating to hearing abilities.

Numerous studies from as early as 1985 have reported auditory and otological manifestations related to HIV / AIDS. Cross-sectional adult studies have reported hearing loss prevalence of respectively 23%, 29%, 28.3%, 33.5%, 39% and

49%. A larger percentage of hearing loss was evident in more advanced stages of immune suppression with abnormal otoneurological findings and central-versus-peripheral damage increasing with disease progression. Despite a certain amount of variability across studies in regards to criterion used for defining hearing loss (sample size as well as distribution of subjects according to immunological status) there is a general trend of increasing hearing loss across the frequency range, especially of a sensorineural nature, with disease progression.

Although these statistics show some variation in the incidence of hearing loss in the HIV / AIDS population, it seems conclusive that a higher incidence of hearing loss occurs in the HIV / AIDS patient. Advances in HAART have proven to be highly effective in preserving and reinstating the immune system in the presence of the disease; as a result, HIV is becoming a chronic, as opposed to acute, condition with significantly longer life expectancy. By the end of 2015 approximately 17 million HIV positive individuals were using antiretroviral therapies. This means that non-life threatening aspects of the disease affecting quality of life, such as those relating to hearing and balance, are becoming increasingly important. Hearing loss often causes poor communication, social

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isolation, withdrawal, depression, dementia, frustration, decreased functional status, and maladaptive behaviour.

This highlights the need for early detection of auditory and otological symptoms and suggests that audiological monitoring should be a part of routine medical care in HIV / AIDS patients. In turn, this has major implications, especially for developing countries with a very high HIV / AIDS prevalence and limited resources.

**Further reading**

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**SUMMARY**

- More than 36.7 million people live with HIV / AIDS as a chronic condition with an increased life expectancy due to highly effective ARV therapies.
- An increased incidence of hearing loss in HIV / AIDS patients is reported. This implies a growing population of patients with auditory and otological manifestations.
- There is a need for structured audiological monitoring programmes to be put in place as routine care for HIV / AIDS patients.
- The increased need for monitoring and treatment of audiological abilities implies a growing need for resources – especially in developing countries.

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Yolandé van der Westhuizen is an audiologist in Gauteng, South Africa. She has a great love for research and a passion for the education of her patients and the public on the importance of hearing, early detection of hearing loss and early intervention. She currently has two hearing clinics which focus mainly on diagnostic assessments, hearing aid dispensing and auditory rehab. She also currently serves on the SAAA (South African Association of Audiologists) management team.