

Role of Audiologists in Managing COVID-19 Patients: Is It Too Soon?

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The role of an audiologist, like that of other health care professionals, is ever-evolving. In fact, during the advent of audiology in the 1940s, audiologists' scope of practice did not include vestibular assessment and management or fitting of hearing aids.¹ The auditory and vestibular systems can be affected by a various diseases and medications used to treat some health conditions.²⁻³ A quick literature review of contributing factors of hearing loss worldwide yielded the following: aging, otitis media, occupational noise, non-communicable diseases (e.g., diabetes), communicable diseases (e.g., mumps), and the use of ototoxic medications to name a few.⁴⁻⁶ As such, audiologists are often part of multidisciplinary teams in health care settings and across a variety of contexts, including schools, community clinics, and industrial settings.

Whenever a novel disease or pharmaceutical treatment is discovered, a *sine qua non* for audiologists and hearing health specialists is the evaluation of the clinical audiology picture of the disease and an investigation of possible ototoxic effects of the pharmaceutical treatment. COVID-19 is not exempted from this necessity—as shown by recently published articles on the audiological profiles of COVID-19 patients and the potential ototoxic risks of treatments.⁷⁻⁸ As experts learn more about the novel coronavirus, hearing care providers have begun to ask: What is the role of audiologists in the management of patients diagnosed with COVID-19?

AUDIOLOGICAL MANIFESTATION OF COVID-19

A few published studies have looked into the impact of COVID-19 on the auditory and vestibular systems. Mustafa investigated the hearing thresholds of 20 participants with COVID-19 and 20 controls and found that those with COVID-19 had elevated hearing thresholds (≥ 4 kHz) and significantly lower transient evoked otoacoustic emissions (TEOAEs) amplitudes.⁹ A case report involving 82 participants with COVID-19 found that 1.2 percent of the participants had sensorineural hearing loss.¹⁰ Another case study found binaural hearing loss and



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tinnitus, albeit it only had one participant.¹¹ A cross-sectional study of more than 1,400 participants with COVID-19 reported otalgia in 25 percent of the participants, rotatory vertigo in 0.4 percent, and tinnitus in 0.3 percent.¹² Finally, Cui and colleagues reported tinnitus in five percent of the 20 participants with COVID-19.¹³

RISK OF OTOTOXICITY DUE TO TREATMENTS

With no available treatment nor vaccine for COVID-19, the therapy model used for COVID-19 patients targets the symptoms and provides general support. Antivirals and anti-inflammatory drugs have been found to help manage the symptoms. Widely used as antimalarial drugs, chloroquine (CQ) and hydroxychloroquine (HCQ) have been used to treat COVID-19 patients due to their antiviral properties.¹⁴⁻¹⁵ The use of CQ has been approved by various drug safety regulators in different countries. However, the ototoxic effects of these drugs may manifest as both auditory and vestibular impairments, with patients reporting audio-vestibular symptoms such as imbalance, tinnitus, and hearing loss.¹⁶ Amid a growing debate on the reversibility of CQ and HCQ ototoxicity, some studies have found that these audiological symptoms can be transient, although some patients have reported permanent auditory and/or vestibular impairments.¹⁷⁻¹⁸

Azithromycin, which is used to prevent severe respiratory infections in patients with viral infections, has shown promise in COVID-19 treatment when combined with HCQ.¹⁹ Although this combined therapy may not be used often, the ototoxic effects of azithromycin must be highlighted. The administration of this drug has been reported to cause transient hearing loss,²⁰ with some studies reporting permanent



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hearing loss even when the drug was administered in low doses.²¹⁻²²

Other Ototoxic Drugs. For patients with acute COVID-19, other treatments have been introduced, such as aminoglycosides for the treatment of secondary bacterial infections in pneumonia.²³ The auditory and vestibular effects of aminoglycosides have been extensively reported.²⁴⁻²⁶ Other antiviral drugs such as remdesivir, favipiravir, and lopinavir, which have been proposed as potential treatments, have also been reported to be ototoxic.²⁷

Although the mentioned studies have shown evidence of the impact of COVID-19 on the auditory and vestibular systems, the incidence was low. This could be attributed to the low reporting of patients' audiovestibular symptoms due to the need to prioritize life-saving interventions during the acute phase of the disease.


A concerning observation, however, is the poor description of audiological symptoms in these studies. For example, in most of the studies, no report was made on the treatment the participants were on, and there is no clarity of whether the symptoms pre-existed the virus. A recent rapid systematic review assessed the quality of seven studies reporting on audiovestibular symptoms in COVID-19 patients, using the National Institutes of Health's Quality Assessment Tool for Case Series.⁸ This systematic showed that three of the studies were of poor quality (two case reports and one cross-sectional study), and four were rated as fair (three case reports and one cross-sectional study). Nonetheless, audiovestibular symptoms have been reported in COVID-19 patients as indicated in the cited studies and it is prudent that audiologists and other health care professionals should not ignore that until there is sufficient research evidence showing otherwise.

AUDIOLOGISTS & COVID-19 MANAGEMENT

Audiological intervention. Given the emerging research evidence on the audiovestibular symptoms in patients with COVID-19, audiologists have a responsibility to be part of multidisciplinary teams that manage patients with this disease. Audiologists must play a leading role as patient advocates to make sure that other health care professionals are cognizant of possible auditory-vestibular systems problems that may result following COVID-19 infection or as a result of treatment that patients receive when treated for COVID-19. Patient education and counseling regarding potential problems that may result from COVID-19 infection and treatment will also help patients overcome denial of audio-vestibular difficulties that they may experience which may lead to more reporting of these symptoms, and seek appropriate management and/or treatment. As audiologists, we also have a significant role to play in generating the required clinical and research evidence that document the impact of COVID-19 on the auditory-vestibular system to contribute to literature or knowledge regarding the audiological profile of patients diagnosed or treated for COVID-19.

Vestibulotoxicity and Ototoxicity monitoring. Audiologists also have a major role to play in ensuring proper monitoring of the hearing thresholds of COVID-19 patients who are

treated with drugs that are known to be ototoxic. Responsibilities include detecting changes in hearing status earlier so that modification in the drug used may be considered and providing audiological intervention when impairment occurs (or has occurred).²⁸ The latter may be more crucial during the COVID-19 pandemic as in some cases the disease may be life-threatening and drugs used may not be modified. Otoacoustic emissions and high-frequency audiometry are highly recommended in the monitoring of ototoxicity as they are sensitive in detecting auditory impairments earlier.²⁸

Because of the contagious nature of COVID-19, researchers have highlighted ways in which audiologists can continue serving their patients, and in this case, COVID-19 patients. Using what is now termed low- and no-touch audiology, audiologists can reduce the risk of infection.²⁹ Traditional audiological services that require the use of sound-treated audiometric booth have been shown to pose a medium to high infection risk.²⁹ Therefore the use of boothless audiometry may decrease the risk of cross-infections, especially when managing patients diagnosed with COVID-19 during the acute phase of the disease. Recently, an all-in-one audiological equipment has been validated to conduct comprehensive diagnostic audiometric assessments (pure tone [air- and bone conduction], speech, and immittance audiometry) outside of the booth.³⁰⁻³² This type of solution could facilitate accurate comprehensive audiological services via a low- and no-touch approach. 

References for this article can be found at <http://bit.ly/HJcurrent>.