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Auditory Cinchonism in COVID Era

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The battle over coronavirus disease 2019 (COVID-19) is taking a different turn over different parts of the world. The previously austere lifestyle is taking a completely different turn, where people in various parts of the world have started to go outdoors. During the ongoing combat against COVID-19, multiple treatment regimens have been attempted and investigated, including use of hydroxychloroquine (HCQ) and its derivative chloroquine. Traditionally, HCQ and its quinine-related derivatives were vastly used for malaria and autoimmune diseases, notably systemic lupus erythematous (SLE). Its antiviral and anti-inflammatory properties account for its potential use in COVID-19 treatment.

Hydroxychloroquine, along with its derivatives, has unveiled its prospect in treating COVID-19 based on in vitro studies, though clinical trials are still ongoing.[1] We are now facing a surge in demand for HCQ and its derivatives in the community as this drug is freely available. Albeit the search for an elixir to treat COVID-19 continues, patients who have recovered from COVID-19 following HCQ-treatment are now facing a new predicament, its side effects. Known potential side effects following HCQ and its derivatives include arrhythmias, retinopathy as well as muscle weakness.

Cinchonism, a term used to describe disorder characterized by dose-related side effects of quinine and its derivatives, including a variety of auditory toxicity such as sensorineural hearing loss, tinnitus, and vertigo. Auditory manifestation following HCQ can either be temporary or permanent,[2] while ototoxicity following chloroquine has been found to be irreversible.[3]

The plausible hypothesis of auditory toxicity includes atrophy of stria vascularis as well as nerve fibre damage[4], outer hair cell damage, inhibition of postsynaptic sodium channel function in cochlear spiral cell ganglion along with changes in central auditory function.[5] In addition to that, accumulation of chloroquine leads to injury to sensory hair cells, reduction in neuronal population, and loss of supporting hair cells (Bortoli).

It is noteworthy that, administration of more than one ototoxic drug leads to synergic effect, for instance administration of azithromycin and HCQ simultaneously, further heightens the risk of auditory toxicity.[6] Additionally, the prescribed dosage of HCQ and chloroquine is found to be higher in treating COVID-19 as compared to malaria or SLE treatment.[2] Hence, the auditory ramifications may be intensified. Interestingly, COVID-19 patients with hypoxia prescribed with HCQ or its derivatives are more prone to develop audiological complications as hypoxic status is known to damage the inner ear especially striae vascularis of the cochlea.[2]

According to a recent published literature review, onset of hearing loss following HCQ ranges from months to years.[3] This review reported studies on ototoxicity ensuing usage of chloroquine dated from 1954 whereas ototoxicity secondary to HCQ is from 1998.[3]

With the climbing numbers of COVID-19 patients treated with HCQ or its derivatives, awareness of auditory complications is prudent as early intervention may prevent detrimental effects notably on quality of life. Patient presenting with hearing loss, tinnitus, and/or imbalance ought to be investigated thoroughly including obtaining a history of recent medication prescribed for COVID-19. Additionally, the investigation should include otoacoustic emission, pure tone audiometry (extended high-frequency pure tone audiometry at 8-16 kHz if possible) once the patient is stable and needful management is to be undertaken immediately including counselling, hearing aid, and tinnitus retraining therapy.[2]

As we are currently facing a challenging situation post COVID era, complications ignited by overzealous treatment adds to the current dilemma. We, therefore, urge that, follow-

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up of patients post COVID-19 includes audiological assessment for early recognition of the affected group in addition to proper counselling of patients who are on HCQ or its derivatives. It is prudent for attending physicians notably the otorhinolaryngologist, to be aware of the potential auditory complication following HCQ usage.

Authors' Note

Jeyasakthy Saniasiaya is responsible for planning, conducting, and reporting the work. Jeyanthi Kulasegarah is responsible for editing the work.

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