

Objective

Investigate if there is a relationship between audiometric findings and audiological symptoms of postCOVID-19 patients.

Abstract

The study was made in the Hospital Civil of Guadalajara, from September 2020 to December 2022, taking 47 patients with SARS CoV2 positive test, 94 ears studied in total.

If the patient had symptoms in no more than 3 month, after COVID infection, such as ear fullness, tinnitus, subjective hearing loss, need to repeat words, ear pain, otorrhea, dizziness, vertigo and facial palsy, were between the age of 18-50 years old, and had a positive Test for COVID19. If the patient accomplish this criteria, we made them an audiometric exam.

The results showed that ear fullness, tinnitus and subjective hearing loss, were the most frequent audiological symptom after covid infection. And most of the symptoms had an Odds Ratio statistically significant to prove that they were related with covid infection but the study of the relationship of this symptoms were out of range of the actual study.

AGE FREQUENCY OF POST-COVID PATIENTS WITH AUDIOLOGICAL SYMPTOMS

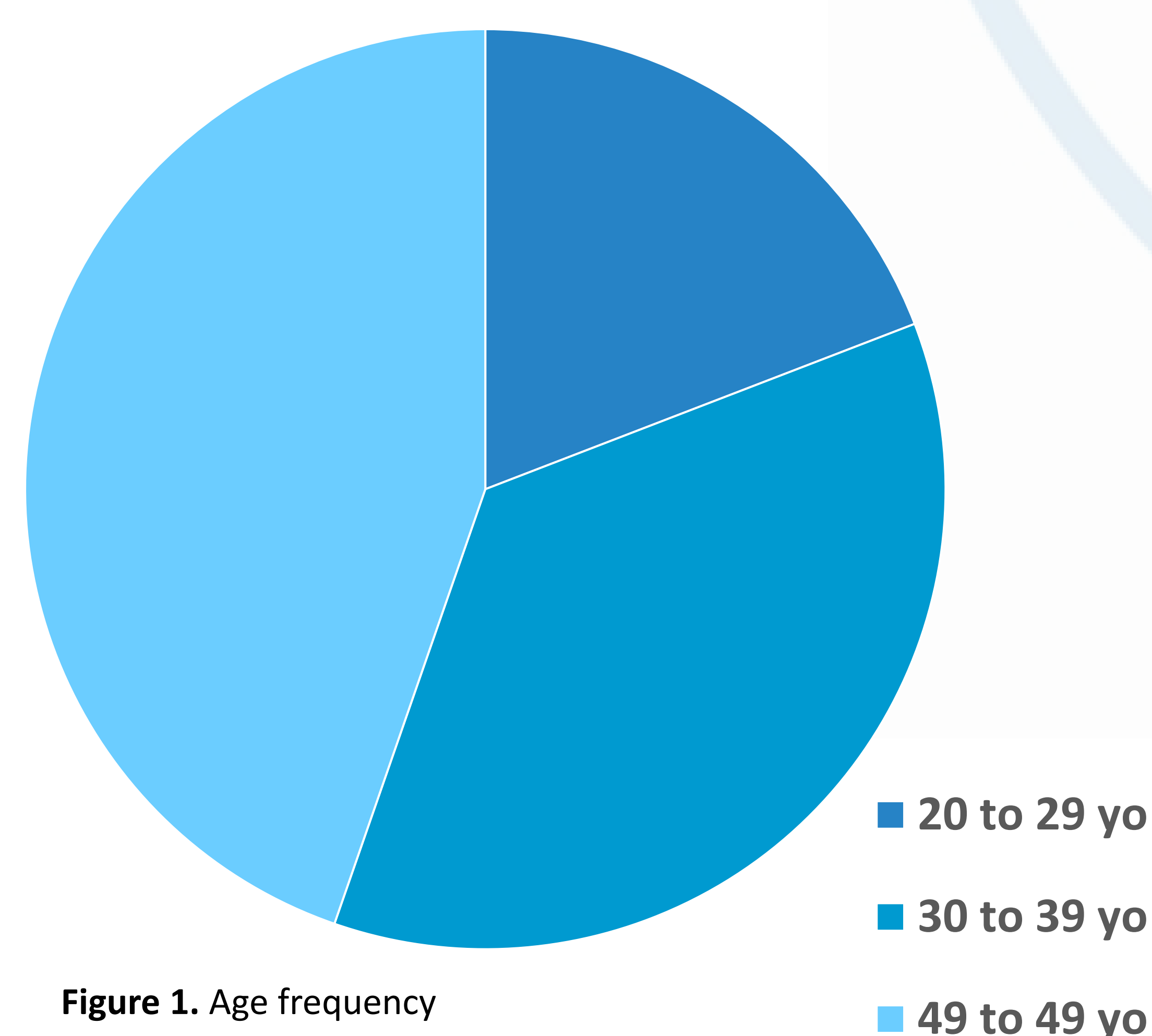


Figure 1. Age frequency

Methods and Materials

The study design was transversal. The patients were attended in the Hospital Civil of Guadalajara from Sep 2020 to Dec 2022 with positive test for SARS CoV2 and audiological symptoms in no more than three months after infection, with the intention of finding a relationship between both. The inclusion criteria was patients with an age between 18-50 years old, positive test for covid19, audiological symptoms after the diagnosis. If the patient suffered from one of the next symptoms: hearing loss, tinnitus, ear fullness, ear pain or otorrhea they were selected to undergo an audiometric study.

Results

The total studied ears were 94, of which 70 (74.5%) had a normal audition, (7.4%) mild conductive hearing loss, (1.1%) mild sensorineural hearing loss, 5 (5.3%) moderate sensorineural hearing loss, (4.3%) sudden hearing loss, (1%) moderate mixed hearing loss and (4.3%) ototubaritis. 60% of the studied ears had ear fullness with a OR = 0.361 (0.131 – 0.995 IC 95% $p = 0.044$) being statistically significant Hearing loss sensation after the COVID19 was referred in 39% of the 94 ears studied (51% of the patients) presenting 2.94 more risk of hearing loss in the audiometric study with OR = 2.940 (1.064 – 8.121, IC 95% $p = 0.033$).

The presence of tinnitus was positive in 59.6% but the relation between hearing loss and tinnitus had a OR of 1.960 (0.721– 5.329 IC 95% $p = 0.183$) being insufficient to set a relation between this two variables.

Regarding tonal thresholds in audiometric studies, we averaged the decibels in all frequencies and found that most of the auditive thresholds were above the normal range, (≤ 20).

RELATION BETWEEN AUDIOLOGICAL SYMPTOMS AND AUDIOLOGICAL FINDINGS

Symptoms	OR
Ear Fullness	0.361 (0.131 – 0.995 $p= 0.044$)
Tinnitus	1.960 (0.721 – 5.329 $p= 0.132$)
Subjective hearing loss	2.940 (1.064 – 9.121 $p= 0.033$)
Need to repeat words	3.802 (1.359 – 10.636 $p= 0.008$)

Figure 2. Odds Ratio of different audiological symptoms.

OTOLOGICAL SYMPTOMS FREQUENCY IN POST-COVID PATIENTS (n = 47)

Symptoms	Frequency (%)
Ear Fullness	74%
Tinnitus	59.6%
Subjective hearing loss	51.5%
Need to repeat words	31%
Ear pain	31.9%
Otorrhea	2.1%
Dizziness	48.9%
Vertigo	21.3%
Facial palsy	0%

Figure 3. Frequency of otological symptoms in post- COVID patients..

Discussion

Many studies have demonstrated that SARS COV2 infection affects internal ear, with inflammatory and vascular reactions. This study included patients that had an audiological symptom after COVID-19 in less than 3 month, we included 47 patients, 19 % had some degree of hearing loss in the audiological studies. The most prevalent symptom was ear fullness in 60% of patients. With an OR = 0.361 (0.131-0.995, IC 95% $p= 0.04$) establishing that the patient has 0.649 less probability of presenting hearing loss in the audiometry.

The subjective hearing loss was referred in 51.1% of patients, representing a 2.94 times more risk of being diagnosed with hearing loss in the audiological exam, OR = 2.940 (1.064 – 8.121 $p= 0.03$).

The rest of audiological symptoms had a prevalence of 31.9% ear pain, 2.1% otorrhea, 48.9 dizziness, 21.3% vertigo and 0% facial palsy, the relationship of this symptoms were out of range of the actual study, but they could have and important significance with the morbidity of the post covid patients.

Conclusions

The prevalence of hearing loss in postCOVID19 patients with audiological symptoms is 38% and sudden NSHL was 8%. Ear fullness as an audiological symptom represents a decreased risk of presenting hearing loss in tonal audiometry in post COVID19 patients with audiological symptoms.

The sensation of hearing loss is related as a risk factor for presenting some degree of hearing loss in the tonal audiometry in post COVID19 patients with audiological symptoms. Paradoxically patients with ear fullness (with an OR of 0.36) showed no changes in audiometric exam, what means that the presence of this symptom reduces the risk of hearing loss.

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