Research Article

# Comparison of Sensorineural Hearing Loss in all Age Groups in the Year 2020 (COVID-19), 2021 and 2022: A Retrospective Study

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**Background:** Hearing loss can be categorized into two types: Conductive and sensorineural. Sensorineural hearing loss, which becomes more prevalent with age, is the most common type and accounts for the majority of all hearing loss cases. This study aims to compare the prevalence of sensorineural hearing loss across all age groups in the years 2020 (during COVID-19), 2021, and 2022.

**Methods:** The study was conducted in the Department of Otorhinolaryngology at R. D. Gardi Medical College in Ujjain (M.P.). A total of 901 patients with audiologically confirmed sensorineural hearing loss (SNHL) were included and evaluated in this study.

**Results:** The patients' ages ranged from 1 to 90 years, with a mean age of 54.13 years. The highest number of patients (30.52%) were in the 61 to 70 age group.

In our study, we exclusively examined and reported 901 cases of sensorineural hearing loss, out of which total patients in 2020, 2021, and 2022 were 118 (13.09%), 336 (37.29%), and 447 (49.61%), respectively. A total of 78 (8.65%) cases were unilateral and 823 (91.34%) cases were bilateral. Male:Female ratios in 2020, 2021, and 2022 were 3.53:1, 1.60:1, and 2.31:1, respectively.

Possible reasons for the reduction of sensorineural hearing loss during COVID-19 lockdown -

1. Nearly all the services, factories, social gatherings and events were suspended during this phase.

2. During the lockdown, there was a notable decrease in noise levels. Before the COVID-19 lockdown, average noise levels varied between 44.85 and 79.57 dB across different areas. However, during the lockdown, these levels dropped to between 38.55 and 57.79 dB.

3. During the lockdown period, road traffic noise was notably reduced compared to the noise levels observed before and after the lockdown.

4. In 2020, the outpatient department (OPD) was open only for emergency cases in March, April, and May, resulting in no diagnoses of sensorineural hearing loss (SNHL) during these three months. Additionally, even after the OPD resumed normal operations, the number of patients seeking treatment was notably lower compared to 2021 and 2022.

**Conclusion:** Most patients with sensorineural hearing loss (SNHL) in this study were male, with an average age of 54.13 years. In 2020 (COVID-19), a total of 118 patients were affected with SNHL as compared to 336 and 447 patients in the years 2021 & 2022, respectively. Affected patients with SNHL in 2020 are less as compared to 2021 & 2022, as per the study.

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**Keywords:** Sensorineural hearing loss, COVID-19, Lockdown, Unilateral sensorineural hearing loss, Bilateral sensorineural hearing loss.

## Introduction

Hellen Keller famously remarked, "Blindness cuts off from things. Deafness cuts us off from people." Hearing loss hinders one's ability to communicate with others, affecting participation in social and professional activities. In children, it disrupts the learning process. Deafness can contribute to cognitive deterioration, dementia, and depression in elderly individuals. Hearing loss is a common issue that often prompts referrals to secondary care for evaluation by an otorhinolaryngologist. Hearing loss can be classified into two categories: conductive and sensorineural. Sensorineural hearing loss, which becomes more common with age, is the most prevalent type and constitutes the majority of hearing loss cases. This type of hearing loss is caused by damage to the cochlea, auditory nerve, or central nervous system. Individuals experiencing newly developed hearing loss should be thoroughly assessed through a comprehensive

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**Table 1:** Total patients in 2020, 2021 and 2022 according to the age groups[7]

| *Age group (Years)* | *Patients in 2020* | *Patients in 2021* | *Patients in 2022* | *Total patients* |
|---|---|---|---|---|
| 1–10 | 01 | 05 | 12 | 18 |
| 11–20 | 03 | 22 | 20 | 45 |
| 21–30 | 06 | 34 | 25 | 65 |
| 31–40 | 08 | 27 | 40 | 75 |
| 41–50 | 16 | 43 | 51 | 110 |
| 51–60 | 34 | 58 | 72 | 164 |
| 61–70 | 35 | 88 | 152 | 275 |
| 71–80 | 15 | 46 | 40 | 101 |
| 80–90 | 00 | 13 | 345 | 48 |

**Table 2:** Total patients with SNHL in 2020-2022[7]

| | *Patients in 2020* | *Patients in 2021* | *Patients in 2022* | *Total patients in 2020, 21, and 22* |
|---|---|---|---|---|
| Total patients with SNHL | 118 | 336 | 447 | 901 |
| Total patients with bilateral SNHL | 114 | 304 | 405 | 823 |
| Total patients with unilateral SNHL | 04 | 32 | 42 | 78 |
| Males with SNHL | 92 | 207 | 312 | 611 |
| Females with SNHL | 26 | 129 | 135 | 290 |

audiometric examination by a diverse team of specialists, including an otorhinolaryngologist, audiologist, radiologist, and speech-language therapist.[1]

Sensorineural hearing loss represents approximately 90% of all hearing loss cases and affects about 23% of individuals over 65. In older adults, hearing loss is commonly attributed to "age-related" factors, while similar hearing loss patterns in younger individuals are often labeled as idiopathic, with little exploration into potential underlying causes.[1]

The 2019 coronavirus disease (COVID-19), caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), is a new and highly contagious virus impacting humans. Evidence indicates that COVID-19 can impact various organ systems throughout the body. SARS-CoV-2 has the potential to invade both the central and peripheral nervous systems, leading to a range of neurological disorders.[2]

Following were the phases of lockdown in 2020-21 in India.

Phase 1: March 24, 2020 – April 14, 2020

Phase 2: April 15, 2020 – May 3, 2020

Phase 3: May 4, 2020 – May 17, 2020

Phase 4: May 18, 2020 – May 31, 2020[2]

The lockdown period in 2021: April 5, 2021 - June 21, 2021. Nearly all the services, Commercial work, factories, social gatherings, meetings and events were suspended during this phase.

### *Aim and Objectives*

To compare sensorineural hearing loss in all age groups in the years 2020 (COVID year), 2021, and 2022.

### *Inclusion Criteria*

- The study included patients of all ages and genders who presented with hearing loss at the otorhinolaryngology outpatient department.
- The study specifically focused on patients with sensorineural hearing loss, whether unilateral or bilateral.

### *Exclusion Criteria*

- The study did not include patients with congenital hearing loss, conductive hearing loss, or mixed hearing loss.

### *Methods*

The research was conducted at the Department of Otorhinolaryngology, R. D. Gardi Medical College in Ujjain (M.P.). Each patient underwent a comprehensive examination of the ears, nose, and throat, including otoscopy and tuning fork assessments. Additionally, pure tone audiometry (PTA) was carried out as part of the audiometric evaluation.

**Table 3:** Total patients in 2020, 21 and 22 according to the month[7]

| *Months* | *Total patients in 2020* | *Total patients in 2021* | *Total patients in 2022* |
|---|---|---|---|
| January | 13 | 29 | 30 |
| February | 37 | 34 | 41 |
| March | 16 | 41 | 27 |
| April | 00 | 08 | 27 |
| May | 00 | 03 | 30 |
| June | 00 | 22 | 38 |
| July | 01 | 30 | 40 |
| August | 05 | 25 | 45 |
| September | 06 | 45 | 41 |
| October | 10 | 29 | 43 |
| November | 16 | 35 | 43 |
| December | 14 | 35 | 42 |
| Total | 118 | 336 | 447 |

## Results

The study encompassed 901 cases in total. The distribution of patients for the years 2020, 2021, and 2022 was 118 (13.09%), 336 (37.29%), and 447 (49.61%), respectively. The patients were segmented into age brackets of 1 to 10 years, 11 to 20 years, 21 to 30 years, 31 to 40 years, 41 to 50 years, 51 to 60 years, 61 to 70 years, 71 to 80 years, and 81 to 90 years for the years 2020, 2021, and 2022. The largest number of patients fell into the 61 to 70 age bracket, with 275 individuals representing 30.52% of the total. Specifically, in 2020, 2021, and 2022, the numbers of patients in this age group were 35 (29.66%), 88 (26.19%), and 152 (30.00%), respectively. The average age of the patients was 54.13 years. The overall ratio of males to females was 2.10:1. For the years 2020, 2021, and 2022, the male-to-female ratios were 3.53:1, 1.60:1, and 2.31:1, respectively (Table 1).

According to PTA results, there were 78 cases (8.65%) of unilateral hearing loss and 823 cases (91.34%) of bilateral hearing loss. Among the unilateral cases, right-sided hearing loss was observed in 49 cases (62.82%), while left-sided hearing loss was present in 29 cases (37.17%). The distribution of unilateral hearing loss for the years 2020, 2021, and 2022 was 4 cases (3.38%), 32 cases (9.52%), and 42 cases (9.39%), respectively (Table 2).

## Discussion

In this study, patient ages varied from 1 to 90 years, with an average age of 54.13 years. The largest patient group

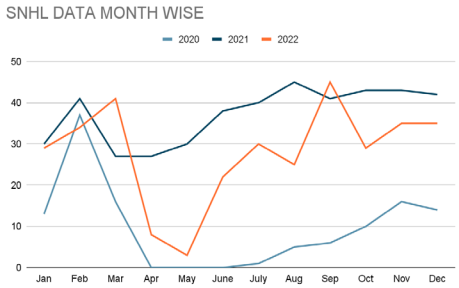


**Figure 1:** SNHL data month wise

was between 61 and 70 years old, comprising 30.52% of the total. This result aligns closely with Angeli *et al*., who found a mean age of 54.4 years.[3] Segal *et al*. noted the highest patient count in the 56 to 65 age range (29.1%), though their study focused exclusively on patients with asymmetric hearing loss.[4] Cruickshanks *et al*. reported a mean age of 65.8 years, including patients aged 48 to 92 years.[5] In our research, we examined 901 cases of sensorineural hearing loss, with patient distributions for 2020, 2021, and 2022 being 118 (13.09%), 336 (37.29%), and 447 (49.61%), respectively. Among these, 78 cases (8.65%) were unilateral, while 823 cases (91.34%) were bilateral.

Following were the phases of lockdown in the year 2020-21 in India -

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Possible reasons for the reduction of Sensorineural Hearing Loss during COVID-19 lockdown -

- Nearly all the services, factories, social gatherings and events were suspended during this phase.
- During the lockdown, there was a notable decrease in noise levels. Before the COVID-19 lockdown, average noise levels varied between 44.85 and 79.57 dB across different areas. However, during the lockdown, these levels dropped to between 38.55 and 57.79 dB.
- During the lockdown period, road traffic noise was notably reduced compared to the noise levels observed before and after the lockdown.
- In 2020, the outpatient department (OPD) was open only for emergency cases in March, April, and May, resulting in no diagnoses of sensorineural hearing loss (SNHL) during these three months. Additionally, even after the OPD resumed normal operations, the number of patients seeking treatment was notably lower compared to 2021 and 2022 (Table 3 and Figure 1).

## Conclusion

In this study, most patients with sensorineural hearing loss were male, with an average age of 54.13 years. In 2020 (COVID-19), a total of 118 patients were affected with SNHL as compared to 336 and 447 patients in the years 2021 & 2022, respectively. Affected patients with SNHL in 2020 are less as compared to 2021 & 2022, as per the study.

Possible reasons for the reduction of Sensorineural Hearing Loss during COVID-19 lockdown -

- During this period, almost all services, factories, social gatherings, and events were halted.
- During the lockdown, a notable decrease in noise levels was recorded. Before and during the COVID-19 lockdown, the average noise levels varied between 44.85 and 79.57 dB prior to the lockdown and between 38.55 and 57.79 dB during the lockdown across different areas.[6]
- Throughout the lockdown period, road traffic noise was observed to be lower compared to the levels before and after the lockdown.
- In 2020, the outpatient department (OPD) was operational only for emergency cases in March, April, and May, resulting in no diagnoses of sensorineural hearing loss (SNHL) during these months. Furthermore, even after the OPD resumed regular operations, patient visits for treatment remained lower compared to the years 2021 and 2022.

Sensorineural hearing loss can affect younger individuals, too, emphasizing the critical need for timely diagnosis and early intervention.

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