

## **Dizziness after post-cochlear implantation – A Prospective questionnaire study- (original research study)**

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### **Original Research Article**

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**Abstract:** Cochlear implantation is one of the extraordinary advancement in auditory field but in some cases vestibular dysfunction has been reported. The aim of this study is to determine the cases of vestibular dysfunction in terms of dizziness. A questionnaire was prepared to assess the type and onset of dizziness. 150 patients were included in the study. Dizziness was reported in 55% of the cases. Dizziness is a common complaint among the patients after post cochlear implantation. However, the degree of dizziness can vary.

**Keywords:** Cochlear implants, Dizziness, Vestibular dysfunction.

### **INTRODUCTION**

Cochlear implantation is believed to be an extraordinary advancement in the auditory field. Recently, for sensorineural hearing loss (SNHL) this treatment has been used[1].

The indications of Cochlear implant have been revised for which the primary reason is open set word recognition by the patients with implants. In adults, preoperatively in those patients which have greater degrees of residual hearing accomplish greater levels with cochlear implants. Same is the case with younger children[2].

After recognition of unilateral implantation, bilateral implantation has made great accomplishment in patient's hearing comfort which includes access to sound information from the ears on left and right side, improved perception of speech in both quiet and noise environment along with localization of the sound[3].

There is no doubt that cochlear implantation gives the patients a level of comfort for hearing but vestibular dysfunction cannot be ignored. Thus it is important to analyze the effects of cochlear implantation on vestibular system.

### **METHODS**

A questionnaire was prepared with help of various scientific studies. The selection of population was based on those patients who had undergone postoperative cochlear implantation for sensorineural hearing loss. These patients were provided with questionnaire in English and Hindi. For those patients who were unable to converse in both, an attendant himself communicated with the patient and completed the questionnaire. All those patients which were included had only unilateral cochlear implantation. The questionnaire included the type of dizziness and its onset[4,5].

### **Questionnaire**

1. Cochlear implantation – Unilateral/ Bilateral?
2. Was dizziness present before cochlear implantation? Yes/No
3. Did the dizziness start immediately after cochlear implantation? Yes/No
4. Did the dizziness start after one week of cochlear implantation? Yes/No
5. Did the dizziness start after one year of cochlear implantation? Yes/No
6. Can you carry out your daily activities without feeling any discomfort in the ear? Yes/No
7. Did you feel unsteadiness after cochlear implantation? Yes/No
8. Did you feel light headedness after cochlear implantation? Yes/No
9. Did you experience vertigo after cochlear implantation? Yes/No

10. Are you unable to identify the symptom of dizziness? Yes/No

To compare the results, the classifications and definitions by Shoman *et al.* were used[6]. Dizziness was classified as in Table 1 and onset of dizziness was classified into three categories as in Figure 1. The criteria of early dizziness included start of dizziness within first week of cochlear implantation, delayed included start of dizziness during first year after cochlear implantation and late onset included dizziness after first year of cochlear implantation[1]. The data was assessed and statistically analyzed using SPSS Version 22.0.

**RESULTS**

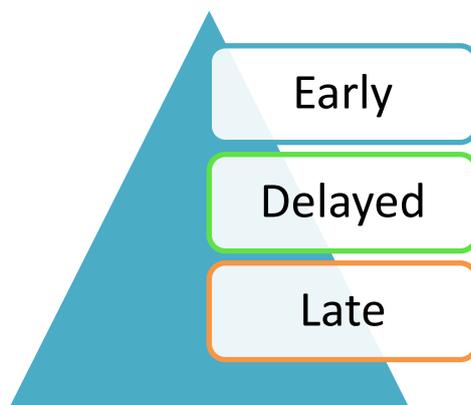
From the 150 questionnaires, 93 patients were able to fill the questionnaire themselves. For rest of the patients, attendant helped the patient to fill the questionnaire. The mean age of the patients was 63 years. From the population, 124 patients were males and rest of them was female patients.

**Prevalence of dizziness**

From 150 cases, the prevalence of dizziness before cochlear implantation was 28.7% (43 patients – Group A), whereas the prevalence of dizziness after cochlear implantation was 71.3% (107 patients – Group B). From 107 patients, two groups (Group B1, Group B2 and Group B3) were formed depending upon the onset of dizziness after cochlear implantation (Table 2). When the symptoms of Dizziness were compared in the group having patients which had dizziness after cochlear implantation, Unsteadiness came out to be the most common subtype followed by lightheadedness, vertigo and non-specific dizziness. In group B1, Unsteadiness (48%), Light headedness (44%), Vertigo (6.7%) and Non-specific dizziness (1.3%) was found. In group B2, Unsteadiness (52.4%), Light headedness (33.3%), Vertigo (9.5%) and Non-specific dizziness (4.8%) was found. In groupB3, Unsteadiness (63.6%), Light headedness (27.3%), Vertigo (9.1%) and Non-specific dizziness (0 %)(Figure 2).

**Table-1: Sub classification of Dizziness**

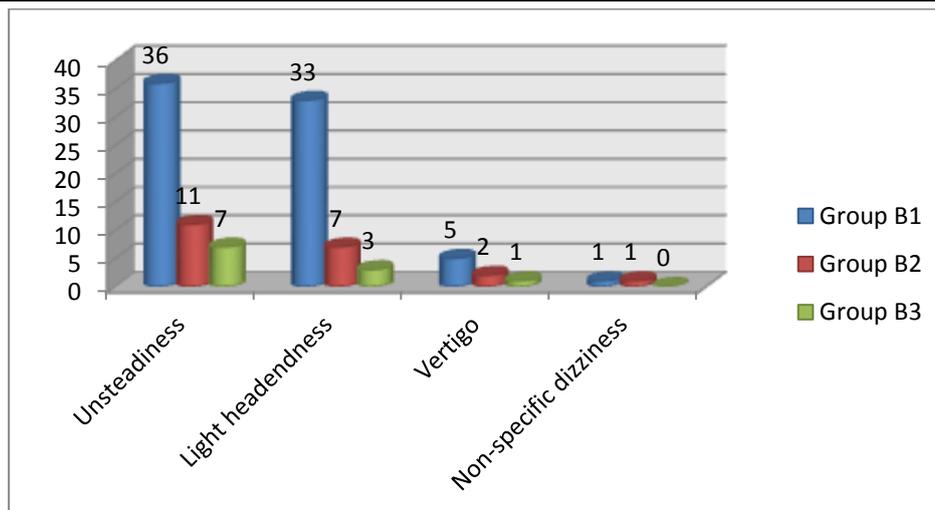
1	Light Headedness
2	Unsteadiness
3	Vertigo
4	Non-Specific dizziness



**Fig-1: Onset Of Dizziness**

**Table 2 Classification of groups depending upon symptoms of dizziness**

Groups	Number of patients	Percentage
According to presence of dizziness before or after cochlear implantation		
Group A (Dizziness before cochlear implantation)	43	28.7%
Group B (Dizziness after cochlear implantation)	107	71.3%
Group B – According to onset of dizziness		
Group B1 (Early)	75	70.1%
Group B2 (Delayed)	21	19.6%
Group B3 (Late)	11	10.3%



**Fig-2: Comparison of subgroups B1, B2 and B3**

**DISCUSSION**

Vestibular dysfunction cannot be ignored after the cochlear implantation. From our results we found out that dizziness is a common symptom in the patients after cochlear implantation. However, in some of the patients dizziness was also present before cochlear implantation.

As regards to onset of dizziness our results showed that 70% of the patients showed early onset of dizziness while Shoman *et al.* reported 63.4% cases for the same[6].

Kubo *et al.* [7] observed 16% of delayed cases of onset of dizziness and Study by Zawawi *et al*[1] showed 45.4% of delayed cases of onset of dizziness while our study observed 11% of cases for the same.

According to Shoman *et al* [6] the percentage of patients who suffered from dizziness before cochlear implantation was 48.3%, however in our case it came out to be 28.7%. Study by Zawawi *et al* [1]reported this percentage to be 27% which was nearly similar.

Dizziness after cochlear implantation was reported 58.2% by Shoman *et al* [6] and by Zawawi *et al*[1], it was reported to be 45.9% whereas in our study it was found to be 71.3%.

In another study by Kubo *et al.* the dizziness reported after cochlear implantation was 49 % while in our case it was much greater[7].

Dizziness was sub classified into Unsteadiness, Light headedness, Vertigo and Non-specific dizziness from which Unsteadiness was found to be the most common symptom in all the three sub groups. According to Zawawi *et al*[1], 53% of the patients showed the symptom of unsteadiness whereas in our subgroups it was found to be 48% (Group B1), 52.4% (Group B2) and 63.6% (Group B3). So, our study also

supported that Unsteadiness is the most common symptom in the dizziness.

According to Zuwawi *et al*, less than 10% of the patients reported for Vertigo[1]. In our study, similar findings were observed. In all the subgroups, less than 10% of the patients reported for Vertigo. These findings were comparable with the findings of Kubo *et al* who reported somewhat less cases[7].

From this study, it can be observed that a large number of patients complained of dizziness but the symptoms were mild. The cause of dizziness is related to opening of the inner ear along with insertion of the array. That is why more understanding of the changes taking place in vestibular function physiologically as a result of cochlear implantation is needed.

The limitation of this study is that it is only based on questionnaire. Further studies are required for more clear understanding.

**CONCLUSION**

The most common symptoms with patients undergone cochlear implant is dizziness. The symptoms of dizziness in majority of the patients are not severe but cannot be ignored. Patients need to be counseled before cochlear implantation and follow up is important after the cochlear implantation.

**REFERENCES**

1. Zawawi F, Alobaid F, Leroux T, Zeitouni AG: Patients reported outcome post-cochlear implantation: how severe is their dizziness? Journal of Otolaryngology – Head and Neck Surgery 2014;43:49.
2. Arts HA, Garber A, and Zwolan TA:Cochlear implants in young children. Otolaryngologic Clinics of North America 2002;35(4):925-943.
3. Sampaio AL, Arajuo MF, Oliveria CA: New criteria of indication and selection of patients to

- cochlear implant. International Journal of Otolaryngology 2011;2011:1-13.
4. Jacobson GP, Newmann CW: The development of the dizziness handicap inventory. Arch Otolaryngol 1990;116:424-427.
  5. Steenerson RL, Cronin GW, Gary LB: Vertigo after cochlear implantation. OtolNeurotol 2001;22:842-843.
  6. Shoman N, Ngo R, Archibald J, Pijl S, Chan S, Westerberg BD: Prevalence of new-onset vestibular symptoms following cochlear implantation. J Otolaryngol 2008;37:388-394.
  7. Kubo T, Yamamoto K, Iwaki T, Doi K, Tamura M: Different forms of dizziness occurring after cochlear implant. Eur Arch Otorhinolaryngol 2001;258:9-12.