Section A-Research paper

ANALYTICAL STUDY OF SENSORINEURAL HEARING LOSS IN UNILATERAL CHRONIC SUPPURATIVE OTITIS MEDIA

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ABSTRACT

Background: Chronic suppurative otitis media(csom) ,tubo tympanic or safe type is a persistent inflammation of the middle ear or mastoid cavity, and is characterised by recurrent or persistent ear discharge through a perforation of the tympanic membrane. Hearing impairment is the major complication of csom. conductive component is usually affected whereas sensory neural component is also involved in long standing case of safe type of csom. The main objective of the study is identifying the proportion of patients with chronic suppurative otitis media with sensorineural hearing loss.

Materials and methods: This is a prospective study, conducted in the department of otorhinolaryngology in a tertiary care centre from the period of February 2022 to February 2023, between the age group of 20 and 40 years and was diagnosed with csom safe type.

Result : Most patients were in the age group of 30 to 40 years . The longer the duration of the disease the more incidence of SNHL. Age has no relation with the disease and hearing loss.

Conclusion: CSOM safe type usually have a conductive type of hearing loss but it also carries a risk of sensorineural hearing loss component . Duration of ear discharge plays an important role in patients with CSOM in development of SNHL.

Key words : chronic suppurative otitis media, sensory neural hearing loss, tympanic membrane, safe type.

INTRODUCTION:

Chronic suppurative otitis media (CSOM) is a common long-standing infection of a part or whole of the middle ear cleft. It is also the most common important cause of hearing impairment which can be prevented and treated. Hearing loss described in CSOM is usually a conductive type of hearing loss. On contrary there are few patients who also exhibit a sensorineural component. Conductive hearing loss is usually a reversible type of hearing loss whereas sensorineural hearing loss occurs only in long term and is an irreversible type. Performing myringoplasty in patients with sensorineural hearing loss is contraindicated. Therefore, it is important to investigate whether the patient has sensorineural hearing loss. This study helps in identifying the proportion of patients with chronic suppurative otitis media with sensorineural hearing loss.

MATERIALS AND METHODS

A prospective, randomized, quantitative study was conducted in our hospital for a period of one year from February 2022 to February 2023in Department of ENT. The study was undertaken in a group of 100 patients visiting our ENT OPD. The patients included in the study were within the age group of 20 – 40 years of age with unilateral CSOM tubo tympanic type and active stage. Patients below 20 years and above 40 years, bilateral CSOM, unilateral CSOM attico antral type, otitis externa, history of systemic diseases like diabetes, familial hearing loss, prolonged noise exposure, recurrent cholesteatoma and previous otologic surgeries were all excluded from the study. After proper aural toileting the tympanic membrane is visualized for any perforations, granulation tissues and cholesteatoma. Patient details were recorded and compiled. One day recorded details of all the patients are collected and those who satisfy all the required criteria will be taken up for the study. After obtaining proper consent from the patient a detailed otolaryngologic history including hearing impairment, ear discharge, tinnitus, vertigo etc. will be taken from the patient. Extensive ENT examination will be done for the status of discharge, site and size of perforation, ossicular disruption and presence of cholesteatoma. Tuning fork tests such as Rinne's test, Weber's test and ABC are carried out in these patients. Pure tone audiometry is performed in all patients with last episode of ear discharge more than 3 weeks using an audiometer. Air conduction and bone conduction threshold values are tested and plotted in a graph by trained audiologists. Pure tone average which is a calculation used routinely by trained audiologists to calculate the degree of hearing loss in decibels is evaluated. All these findings are documented as per the study Performa.

RESULTS:

Maximum patients presented in the age group of 30 – 40 years (61%)(Fig 2). Both males and females were equally affected with slight female preponderance of 53%(Fig 1). In this study we found that most of the affected patients were labourers and others like students. Mostly lower socio economic class people were affected more than the others .In our study the patients mostly had white mucus discharge followed by yellowish/greenish discharge(fig 3 ,Table 1) .31% of the patients had duration of symptoms more than 15 years. 26% of patients had duration of 11-15 years, 22% had duration of 6 – 10 years and 22 % within 3 months – 5 years(Table 2,fig 4) . Ear pain was absent in 90% of the patients whereas only 10% had ear pain. Tinnitus was present only in 8%. 92% of the patients had no tinnitus. Most of the patients had subtotal perforation (52%). Small and large perforations constituted 22% and 26

% respectively(Fig 5) .In our study most of the patients showed conductive type hearing loss but a small percentage of patients exhibited SNHL component also along with CHL(table 3) .It also showed that 29.03% of the patients with duration of more than 15 years had SNHL component.23.07% of the patients with duration of 11-15 years developed SNHL component and 13.63% within 6 – 10 years developed SNHL component(Fig 6) . patients with tinnitus for more than 15 years developed SNHL component (Table 4,Fig 7) .In my study out of 39 cases in age group of 20 -30 years only 10 cases had SNHL component whereas only 8 cases out of 61 cases in age group of 30 – 40 developed SNHL component(table 5, Fig 8).

DISCUSSION:

Chronic suppurative otitis media (CSOM) is the chronic inflammation of the middle ear with discharge through a perforated tympanic membrane. CSOM is the most common chronic infectious disease in children (1) and is considered the main cause of acquired type of hearing loss (2). Despite the many advances in health care and surgical practices globally, the impact of CSOM is overwhelming and often more noticeable in the developing countries [3]. The important factors to the higher incidence of CSOM in these regions are malnutrition, over-crowding, poor hygiene, colonization with potentially pathogenic microorganisms in the nose and nasopharynx, and there is no easy access to proper and well equipped healthcare facilities [4]. The commonest bacteriology in CSOM are *Pseudomonas aeruginosa*, *Staphylococcus aureus*, *Klebsiella pneumonia*, *Escherichia coli*, and anaerobes [5].CSOM of tubotympanic variety is often considered as safe variety without the involvement of inner ear. Most likely, a conductive hearing loss is seen in a patient suffering from CSOM but Occasionally, an elevated Bone conduction thresholds have been recorded in various audiometric evaluation in patients suffering from CSOM indicating a sensorineural element. Paparella et al (1972) believed that SNHL commonly occurs in patients with this disease. Tympanic membrane perforation and ossicular chain distruption or erosion due to the chronic discharge are often the main reason for conductive hearing loss in CSOM (6). Paperella et al showed in his extensive experimental research where there is an association between SN hearing loss and CSOM. They emphasized the deleterious consequences of chronic otorrhoea for the inner ear. Engel et al in his study on breakdown of round window membrane permeability proposed that damage to the round window membrane by potent pore-forming cytolysins (pneumolsin and streptolysin O) lead to leakage of ions from the perilymph. The Ionic disequilibrium and passage of toxic macromolecules to the cochlea are the important factors leading to disturbances of the inner ear function. MacAndie and O'Reilly (7) found a significant degree of SNHL in the diseased ear, which to be increased in higher frequencies. There was a significant relationship between SNHL and the disease duration observed by Raqib (9) and Kaur(8). These results support the hypothesis that says middle ear inflammation may change the permeability of round window membrane, and the remnants of the bacteria such as endotoxins penetrates through it and cause dysfunction of the inner ear, mainly in high-frequency region which is anatomically located close to the round window (10,11). Duration of the symptoms played an important role in my study. 31% of the patients had longer duration of more than 15 years, 26% of the patients had duration had duration of 11 – 15 years. 22% belonged to 6 – 10 years duration and 21% belonged to 3 months – 5years.

CONCLUSION:

CSOM is one of the common cause of patients to attend ENT OPD. Commonly patients in CSOM have a conductive type of hearing loss but it also carries a risk of sensorineural hearing loss component. Duration of ear discharge plays an important role in patients with CSOM in development of SNHL. Longer the duration, patients have high chances of developing sensorineural hearing loss component.

References

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Figure 1

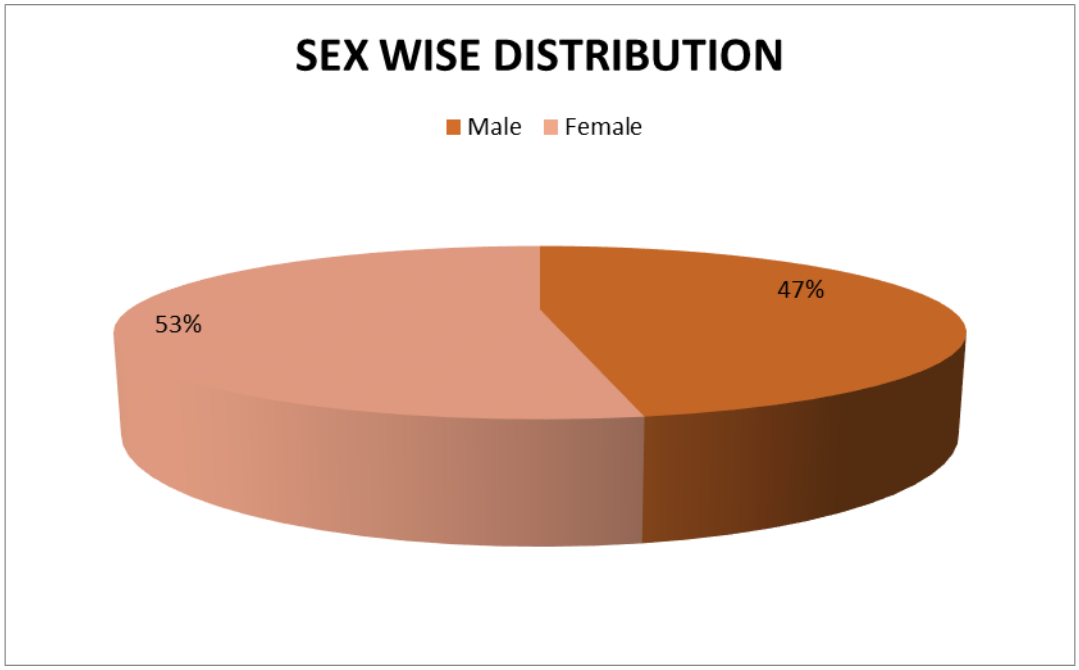

Figure 2

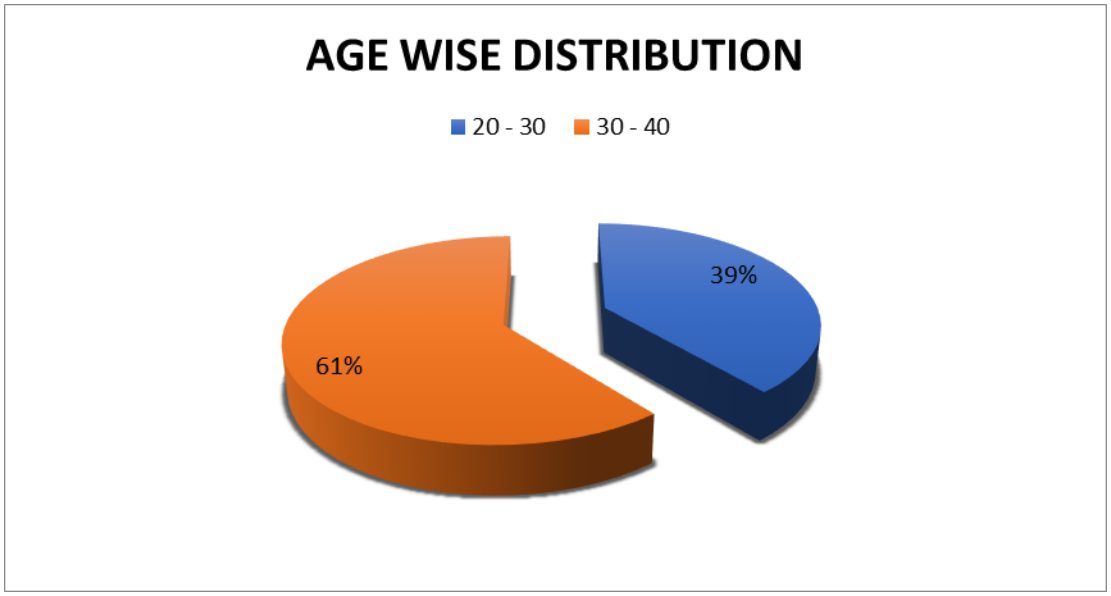

Table 1 DISCHARGE WISE DISTRIBUTION

TYPE OF DISCHARGE	NO.OF CASES	PERCENTAGE
White Mucus	68	68%
Yellowish /Greenish	22	22%
Blood stained	10	10%

Figure 3

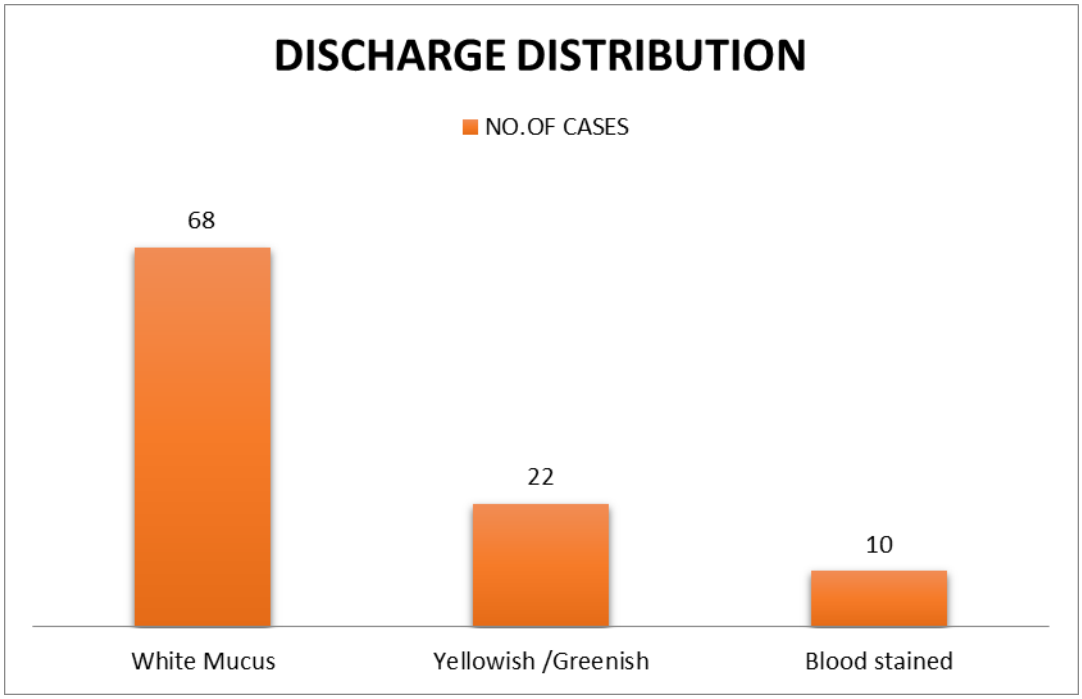

Table 2

DURATION	NO.OF CASES	PERCENTAGE
3 months - 5 years	21	21%
6 - 10 years	22	22%
11 - 15 years	26	26%
> 15 years	31	31%

Figure 4

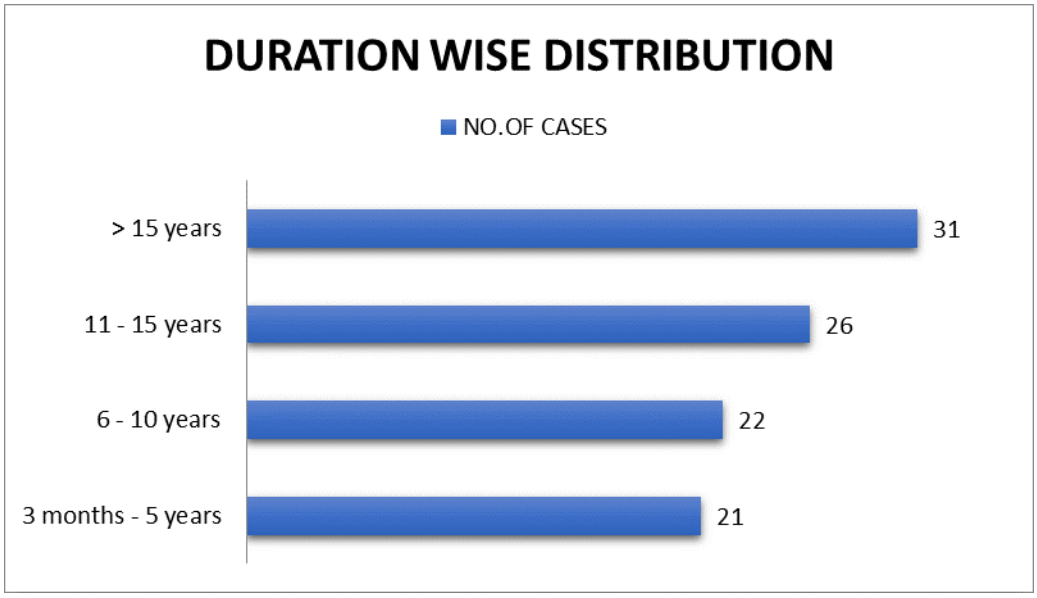

Figure 5

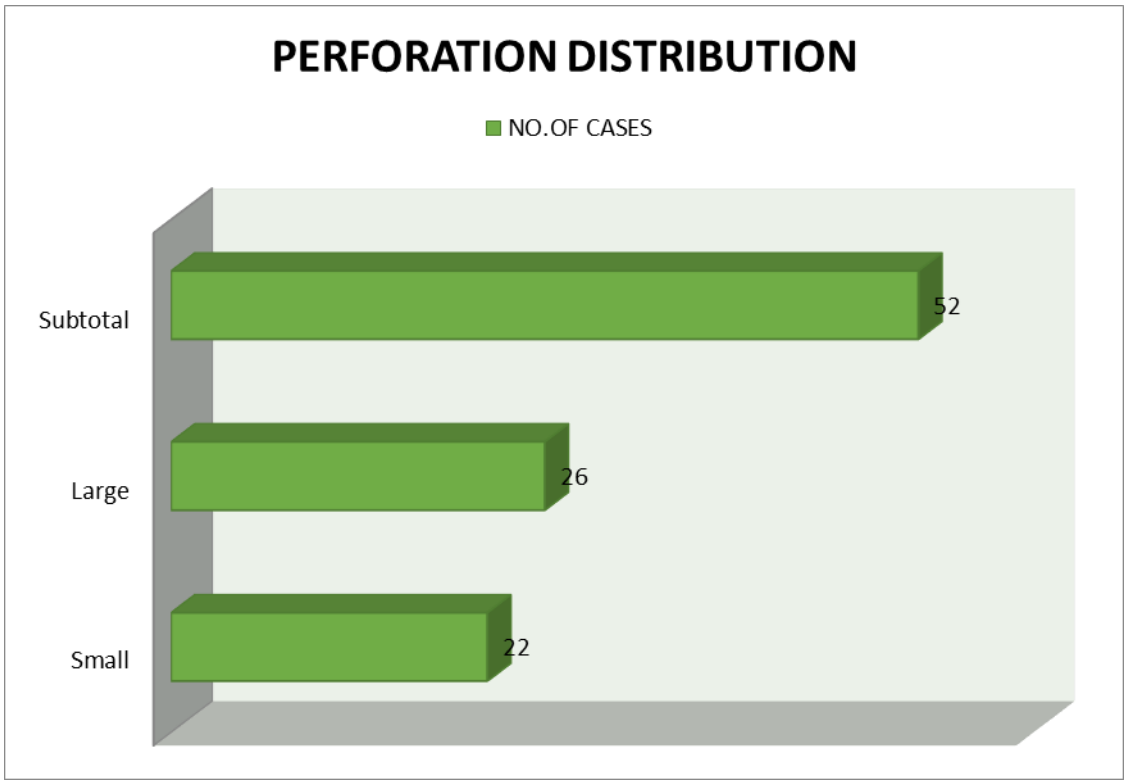

Table 3

TYPE OF HEARING LOSS	NO.OF CASES	PERCENTAGE
Conductive	82	82%
Sensorineural	0	0
Mixed	18	18%

Figure 6

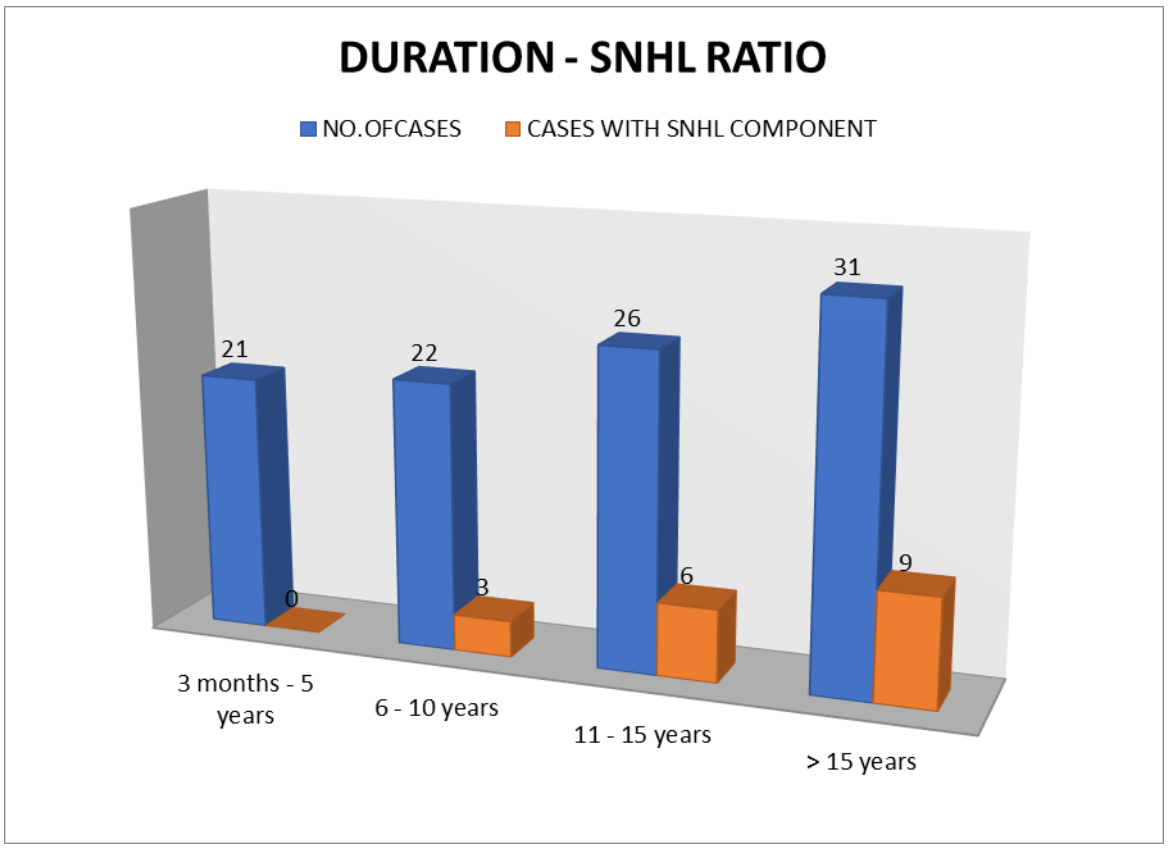

Table 4

Table 1 DURATION – TINNITUS – SNHL DISTRIBUTION

DURATION	TINNITUS	SNHL COMPONENT	PERCENTAGE
3 months - 5 years	0	0	0
6 - 10 years	3	1	33.30%
11 - 15 years	6	2	33.33%

> 15 years	9	5	55.55%

Figure 7

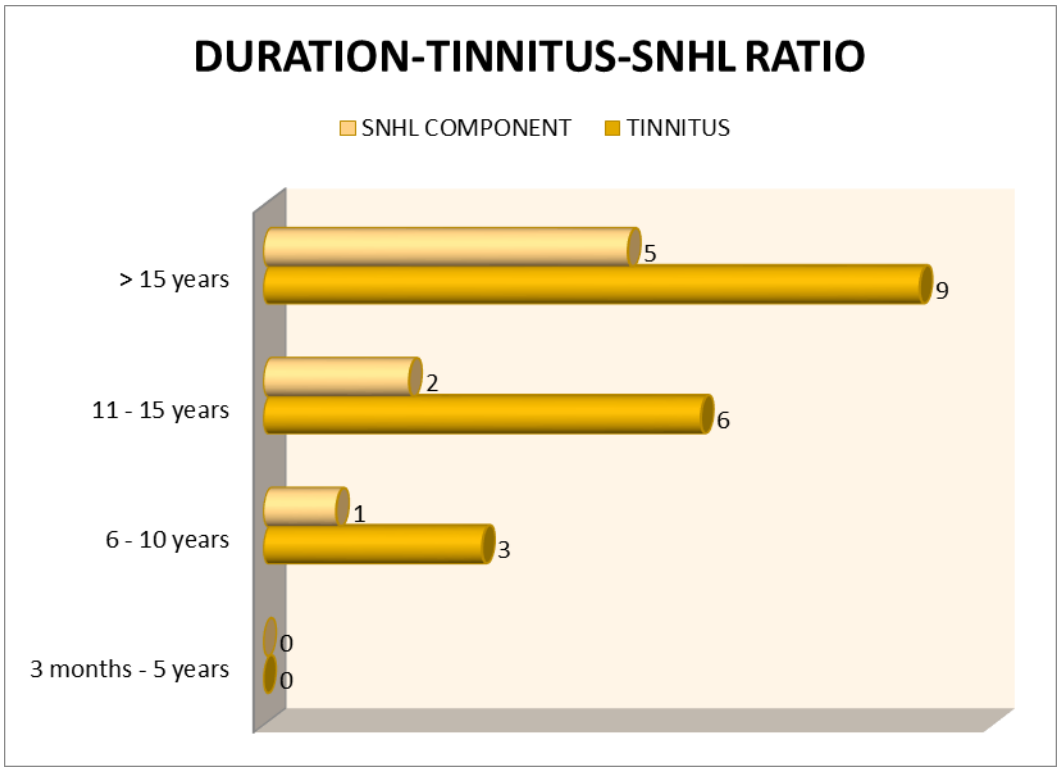

Table 5 : AGE WITH SNHL

AGE	NO. OF CASES	SNHL
20 – 30	39	10
30 – 40	61	8

Figure 8