

AN OBSERVATIONAL SURVEY STUDY ON NOISE INDUCED HEARING LOSS (NIHL) ATTRIBUTABLE TO EMPLOYMENT BY INDUSTRY IN MYSORE DISTRICT

¹Dr Gavimath Shivanand ²Dr Vivek G K ³Dr Sandhya Rani D

¹Professor & H O D, Department of Shalakyatantra, ²Assistant Professor, Department of Shalakyatantra ³Reader, Department of Shalakyatantra, J S S Ayurveda Medical College, Mysuru – Karnataka-India

ABSTRACT

NIHL is generally used to denote the cumulative, permanent loss of hearing that develops gradually after months or years of exposure to high levels of noise. It has long been recognized as a problem in occupations associated with prominent noise. It has been suggested that 12% or more of the global population is at risk for hearing loss from noise, which equates to well over 600 million people. The randomised data is collected in the Industrial suburban workers of the Mysore district. Randomised Survey was done, in financial assistance from RGUHS, Bengaluru. The randomised survey was conducted in the Mysuru district Industrial workers with high emission of sound pollution in mechanical oriented industries from 2016-2017 to 2017-2018. The entire Survey was conducted in selective Industries in and around Mysore urban and rural areas. There is an urgent need to prevent the severity of the NIHL by following the strict guidelines of industrial policy framed by WHO. NIHL is more pronounced in un-organised labour industry as they won't follow any of the precautionary measures

KEYWORDS: Noise Induced Hearing Loss (NIHL), Survey Study, Occupational hazard.

INTRODUCTION

Exposure to excessive noise is the most common preventable cause of hearing loss. It has been suggested that 12% or more of the global population is at risk for hearing loss from noise, which equates to well over 600 million people^[1]. The World Health Organization estimated that one-third of all cases of hearing loss can be attributed to noise exposure^[2]. Noise-induced hearing loss (NIHL) has long been recognized as an occupational disease. Impairment of hearing at high frequencies will initially cause a loss

of clarity in perceived speech and then interfere with daily activities as hearing loss progresses. Hearing loss-related symptoms, such as trouble in normal and telephone conversation, turning up the radio/television volume and tinnitus, usually occur in the early stages of NIHL. Other major health effects due to the noise pollution are lack of concentration, irritation, fatigue, headache, sleep disturbances, etc.

The effects of the exposure to occupational noise are higher in the developing regions. In India there is a lack of epidemiological

data on prevalence, risk factors and costs of NIHL. Hence this study gives prevalence of NIHL.

NIHL is generally used to denote the cumulative, permanent loss of hearing that develops gradually after months or years of exposure to high levels of noise. It has long been recognized as a problem in occupations associated with prominent noise. NIHL is the second most common form of acquired hearing loss after age-related loss (presbycusis), with studies showing that people who are exposed to noise levels higher than 85 db suffered from NIHL. A typical NIHL is of a sensory neural type involving injury to the inner ear. It is bilateral and symmetrical, usually affecting the higher frequencies (3k, 4k or 6k Hz) and then spreading to the lower frequencies (0.5k, 1k or 2k Hz. Impairment of hearing at high frequencies will initially cause a loss of clarity in perceived speech and then interfere with daily activities as hearing loss progresses. Hearing loss-related symptoms, such as trouble in normal and telephone conversation, turning up the radio/television volume and tinnitus, usually occur in the early stages of NIHL. Other major health effects due to the noise pollution are lack of concentration, irritation, fatigue, headache, sleep disturbances, etc. The risk of hearing loss and injury to the ears increases with the sound intensity, the length of time an employee is exposed to noise and the individual susceptibility to NIHL^[3].

The exact magnitude of deafness caused by these conditions is undetermined. Together they are estimated to be responsible for nearly 15% of all causes of deafness based on different studies. Due to inherent

difficulties in population-based studies carried out under field conditions it is difficult to assign either of these causes in field situations.

MATERIALS & METHODS

Data collection: By Survey.

a) The randomised data is collected in the Industrial suburban workers of the Mysore district. Randomised Survey was done, in financial assistance from RGUHS, Bengaluru.

b) Based on the questionnaire and tuning fork tests^[4], 50 patients were selected by subjective evaluation.

c) Based on the audiogram report, patients suffering from minimum 25dB decline in normal hearing range have been considered.

d) Based on the data collected by above said methods, observation were made by giving due consideration to type of industry, chronicity of exposure, degree of hearing impairment, association with other symptoms like tinnitus, headache, sleeplessness, gastric irritation, sex distribution etc.

Inclusion criteria:

The subjects with the decline of <25dBs of hearing impairment and above have been taken for the study with the history of noise induced industrial occupation (5 to 7 exposure).

Exclusion criteria:

Persons suffering from other causes of hearing Impairment such as Acoustic trauma, Senile Deafness, Neuro degenerative deafness and Uncontrolled Diabetes Mellitus induced deafness have been excluded,

OBSERVATIONS & RESULTS

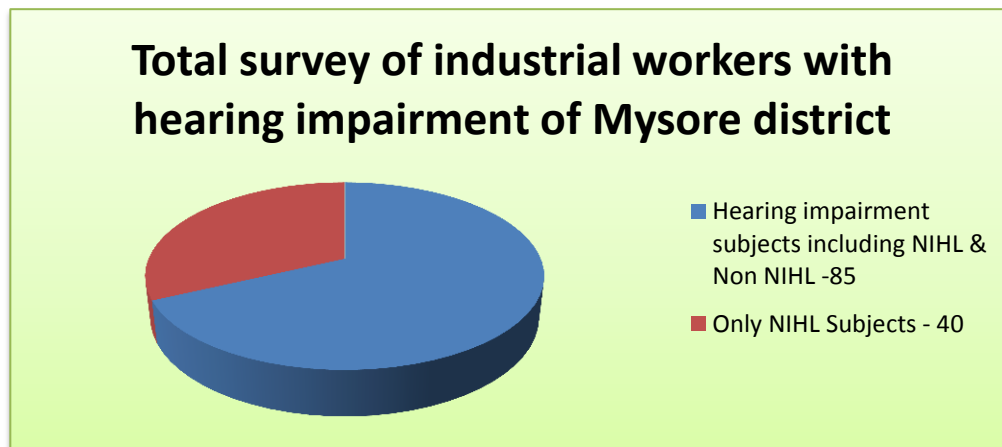
The randomised survey was conducted in the Mysuru district Industrial workers with high emission of sound pollution in mechanical oriented industries from 2016-2017 to 2017-2018. The entire Survey was conducted in selective Industries in and around Mysore urban and rural areas. The NIHL Survey was broadly classified into ChartNo:01.

two categories for professional labour categories. i.e., Organised and Unorganised sectors.

Total number of screened patients: 282

Total number of Hearing Impairment subjects detected (Including NIHL & Non NIHL) – 85

Total number of Only NIHL Subjects Detected - 40



A Brief Survey Report of NIHL in Mysore District Selective Organized & Unorganized labour – Industry & Occupation.

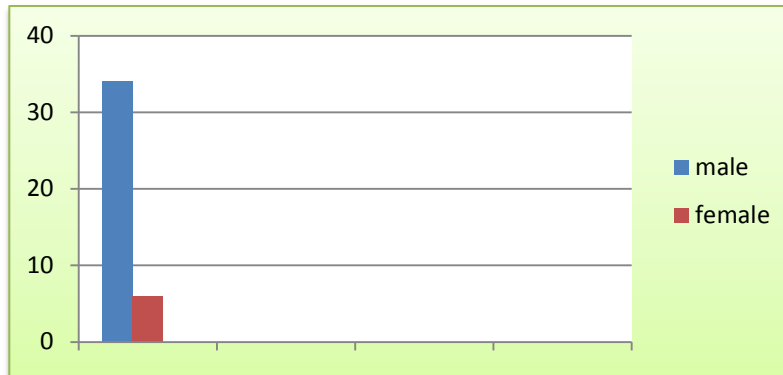
Table No : 01. Selection of subjects from organized industries.

Organizedlabour Industry	Number of Subjects Screened during Survey
Battery Spare Parts Industry	32
Media Printing Press	52
Traffic Police	21
Drivers including JCB	13
Metal cutting Industries –Aluminum	27
Locomotive Diesel engines – Train	02

Table No : 02. Selection of subjects from organized industries.

Unorganizedlabour Industry	Number of Subjects Screened during Survey
Saw Mills	26
Dehusking Rice Mills	18
Welding Engineering Works.	32
Stone Crushing Industry	40
Flour Mills	12
Bore well drilling workers	07

Graph No: 01..Sex distribution



Sex distribution: Out of 40 NIHL subjects 34 were male and 6 were female.

Table No: 03. Distribution of NIHL subjects in different age group.

Age Group	Number of subjects
20- 30 years	Not found
31-40 years	05
41-50 years	08
51-60 years	27

Table No: 04. NIHL subjects with tinnitus and sleeplessness.

Number of subjects with Tinnitus	Number of subjects with sleeplessness	Number of subjects with both.
25	10	05

Table No: 05. Mechanical and non-mechanical industries

Mechanical industries	Non mechanical industries
08	02

Table No: 06. Degree of Hearing Impairment

Degree of Hearing Impairment	Number of Subjects
Mild Hearing Loss	28
Moderate Hearing Loss	10
Severe Hearing Loss	02
Profound Hearing Loss	00

Table No: 07. NIHL association with headache

NIHL Subjects with headache.	NIHL Subjects without headache.
10	30

Table No: 08. NIHL Subjects attributable to habits.

Attributable habits	No of NIHL Subjects
No habits	25
Smoking/tobacco users	07
Alcohol	08

Table No: 09. Along with NIHL, associated complaints observed (Loss of appetite and gastric irritation)

Associated complaints	No of NIHL Subjects
Loss of appetite	08
Epigastric irritation	10
Not noticeable complaints	22

Table No: 10. No of Subjects based on chronicity of the exposure of the Noise Industry.

No of years of noise exposure	No of NIHL Subjects
10 years	8
20 years	22
30 years	10

DISCUSSION

Noise Induced Hearing Loss is one of the unnoticed, slowly burning health of the industrial workers in today's world. As the workers are exposed decades or more till their retirement to the loud emission of sounds, definitely it will be having a deficit effect on the sense organs especially the auditory.

As the NIHL is more common in males than in females is a clear indication that the percentage of workers who work in noisy atmosphere are male dominated, and hence this ratio.

As the NIHL gradually starts in the first decade of the industrial exposure and aggravation to moderate degree of hearing loss in the subsequent decades, it is an alarming phenomenon in the industrial workers. In context there is a need to give more attention regarding the industrial health policies.

NIHL can be considered as a type of *Bhadiryam*^[5]. According to Vagbhata, "*Mithyayogena Shabdhasya Bhadiryam*"^[6] is a clear indication and aetiology for noise induced hearing loss. *Atiyoga of Shabda* (exposure to high frequency sounds for longer duration) will decrease the hearing

capacity of the human race and subsequently may leads to sensory neural deafness and/or other neurological disorders.

Many a times *Bhadiryā* is associated with *Karna Pranada*^[7,8]. Acharya *Vagbhata* says *Karna Pranada* if neglected will leads to *Bhadiryā* gradually^[9]. The other causative factors^[10] for *Bhadiryā* are *Avashyaya*, *Jalakreeda*, *Karnakandu* and *Mithyayoga* of shastra.

The percentage of the industrial workers are working in night shifts, there is variation in the *Dinacharya*, which will impair the biological clock of the human body, will leads to sleeplessness and headache, which will disturb the daily quality of life.

In this survey, the NIHL is more pronounced in the elderly age group than in the young. Here two major reasons play an important role. One is more number of years of sound exposure, and *rasa kshaya* according to advancement of the age and variation of sleep. Hence there is a need to improve the quality of health, especially in the elderly age group among industrial workers.

As per the survey, NIHL is more marked along with Tinnitus. This is because of the

Sthanika atipravrudda vata, which has vitiated the *Sravanendriya* and *vatavaha mahasrotas* (CNS).

Hence all the *vatashamakriyas* should be done to combat the *pravridhdhava* while treating the Tinnitus along with *nidana privarjanam*.

Even though the personal habits may increase the intensity of the hearing loss, it is advisable to treat the alcoholism and tobacco intoxication to prevent the further irreversible damage of the nervous system. Gastritis and headaches are the associated symptoms observed in this study.

Although, the WHO has instructed strict guidelines to follow for industrial workers, many of the industries are not following the health care preventive aspects as per the instructions which is also one of the alarming factor.

CONCLUSION

1. There is an urgent need to prevent the severity of the NIHL by following the strict guidelines of industrial policy framed by WHO.
2. NIHL is more pronounced in unorganised labour industry as they won't follow any of the precautionary measures.
3. Special nourishment, supplementation and good sleep are essential to treat the NIHL subjects as this is more found in the second decade of the noise exposure.
4. Tinnitus and sleeplessness are the major associated complaints which have destroyed the quality of life than the hearing loss. Hence the same has to be addressed while treating holistically.
5. Ear plugs, masking devices and other health precautions to be taken along with food and health supplementations to reduce

the percentage and intensity of the hearing loss.

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CORRESPONDING AUTHOR

Dr Gavimath Shivanand
Professor & Head, Department of Shalaky
Tantra, J S S Ayurveda Medical College,
Mysuru, Kanataka, India.
E-mail: shiva.shalaky@gmail.com

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