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Assessment of Hearing Loss among Workers of A Sugarcane Industry

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Abstract:
Background: *Occupational noise exposure is likely to contribute in very high proportion of cases of sensorineural hearing loss in workers who are continuously exposed to high frequency noise being emitted from industrial machines*
Objectives: *1-To estimate the proportion of noise induced hearing loss among study participants. 2-To study the different types of hearing loss among study participants.3-To study non-audiological health problems related to noise exposure among the study participants.*
Results: *A total of 120 were included in the study i.e 60 in the case group and 60 in the control group. The age of study population ranged from 26-55 years with mean age of 47.1 years in the study group. The range of SPL meter reading was between 85 to 96 dB in the working environment of study population. 30 % of study population had hearing defects,as compared to 8.33% of comparison group. Majority(65%) i.e 13 participants had sensorineural hearing loss and the rest 7 had conductive hearing loss.Majority had bilateral hearing loss.Hypertension, headache and sleep disturbances were reported high among the study participants.*
Conclusion: *A regular medical examination,use of personal protective equipment and periodical maintainence of machines will be useful for protection of the workers from excessive noise prevailing at the work place environment.*
Key Words: *Noise induced hearing loss,Occupational Hearing loss,Sensorineural hearing loss,Sugarcane industry.*

I. Introduction

Occupational noise induced hearing loss is a major cause of disability throughout the world. Occupational noise exposure is likely to contribute in very high proportion of cases of sensorineural hearing loss in workers who are continuously exposed to high frequency noise being emitted from industrial machines.

World wide,16% of disabling hearing loss in adults is attributed to occupational noise.small scale industries like textile,saw mills,printing and mining etc are also responsible for excessive noise and exposure of workers to hazardous noise levels.In India,there are large number of agro based small scale industries.the workers in these industries are exposed to high noise levels prevailing at the work place environment during duty hour.

India is the second largest producer of sugar in the world with more than 45 million of sugarcane growers in the country.one of the agro based enterprises in India,sugar manufacturing is second largest agricultural industry after textile sector.

Excessive sound levels produce a hostile acoustic environment by masking wanted signals and with chronic exposure ,by a central blocking out of all auditory signals. In addition they damage cochlea and thus produce noise induced hearing loss.all these have deleterious effect on education,communication,and the hearing of warning signals

Exposure to loud noise for prolonged periods cause sensory neural deafness.Occupational deafness is a recognized industrial disease.Apart from deafness non-audiological effects like headache,hypertension,and emotional disturbances are also reported

Hence, An Attempt was made to assess the proportion of Noise induced hearing loss among workers in sugar manufacturing industries.

II. Methodology

A cross sectional study was conducted in sugar industry locateed in Vizianagaram district,Andhra Pradesh. Men who were working close to noise generating machinery for more than five years formed the study group.Men residing in the same area formed the comparison group.Age was matched.A total number of 120 were included in the study(60 in the case group and 60 in the control group).A pretested questionnaire was administered and all were subjected to general examination and pure tone audiometry.Study tools were oral

questionnaire,tuning forks,pure tone audiometer,sound pressure level meter,sphygmomanometer etc By using SPL meter, sound pressure readings were recorded at various noise generating machines in all possible corners.Study variables include age,hearing defects,types of hearing loss etc..Data was analysed manually and relevant stastical tests were applied.

III. Results

A total of 120 were included in the study i.e 60 in the case group and 60 in the control group.

Table 1: Age Wise Distrubution Of Population

AGE IN YEARS	STUDY GROUP NO (%)	CONTROL GROUP NO (%)	TOTAL
26-30	6(10%)	3(5%)	9
31-35	3(5%)	6(10%)	9
36-40	3(5%)	3(5%)	6
41-45	12(20%)	15(25%)	27
46-50	24(40%)	18(30%)	42
51-55	12(20%)	15(25%)	27
Total	60	60	120

The age of study population ranged from 26-55 years with mean age of 47.1 years in the study group and 47.5 in tne control group. In our study, majority of were in the age group of 41-51 years and 15% were in the age group of 26-35 years.

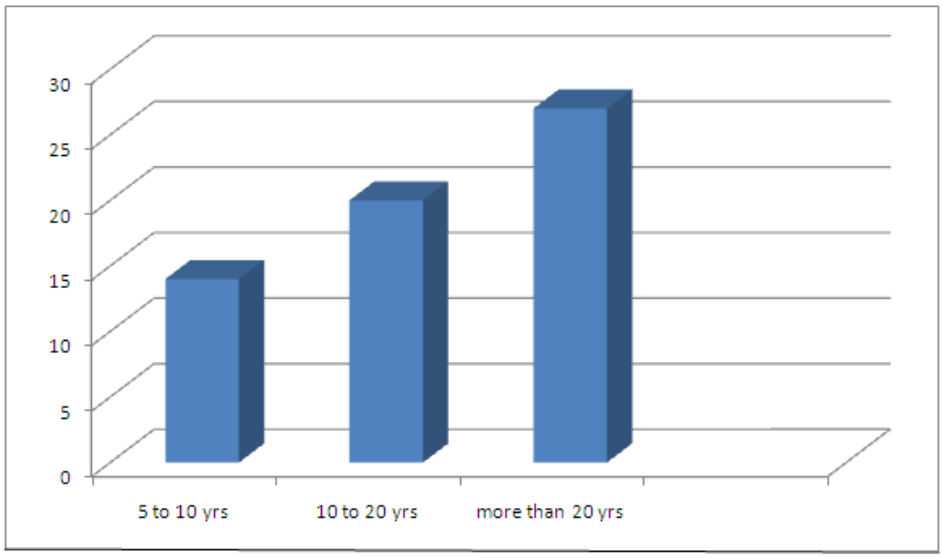

Figure 1 :Distribution Of Study Population Based On Work Experience

Nearly half (45%)of study participants had more than 20 years of working experience near the noise generating machines.

Table – 2: Reading Of SPL(dB) In The Working Environment Of Study Population

MACHINE	CORNER 1	CORNER 2	CORNER 3	CORNER 4
BOILERS	86.6	85	85	85.2
CRUSHERS	88.4	90.2	90.8	89
CENTRIFUGERS	85.6	85.2	-	-
POWER PLANT MACHINE -1	96	-	-	-
POWER PLANT MACHINE -2	85.2	91.6	85.2	87.6

The range of SPL meter reading was between 85 to 96 dB in the working environment of study population.All the study participants work close to these machines on shift basis with 8 hours per day for 6 days a week.

Table-3: Health Problems Reported Among Study And Control Group

S.NO	SYMPTOMS	STUDY GROUP	CONTROL GROUP	TOTAL
1	Hearing defects	20(30%)	5(8.33%)	25(20.83%)
2	Hypertension	16(26.66%)	8(13.33%)	24(20%)
3	Headache	22(36.66%)	7(11.66%)	29(24.16%)
4	Sleep disturbance	10(16.66%)	4(6.66%)	14(11.66%)

As shown in the above table,30 % of study population had hearing defects,as compared to 8.33% of comparison group,and this difference was not statistically significant as P is greater than 0.05. 26.66% of study population were hypertensive,as compared to 13.33% of control group.The other health problems like headache and sleep disturbances were reported high among the study participants.

Table-4: Classification Of Hearing Loss In Case Group

Sensory neural hearing loss(13 MEMBERS)	**Conductive hearing loss(7 MEMBERS)**
Mild: 8	mild: 4
moderate: 5	moderate: 3
unilateral: 2	unilateral: 2
bilateral: 11	bilateral: 5

A total of 20 participants among study group had hearing loss.Majority(65%) i.e 13 participants had sensorineural hearing loss and the rest 7 had conductive hearing loss.Majority had bilateral deafness in both the types of hearing loss.On further analysis it was observed that 75% of participants with hearing loss had more than 20 years of working experience.

IV. Discussion

The word noise is derived from the latin word "nausea"meaning impulsive,unwanted,unpleasant,or loud unexpected sound.Noise as such is achieving dangerously alarming proportion and providing hazardous in all spheres of life more so industries workers.In our study hearing loss was reported high among our study participants may be due to exposure of noise between 85-96 dB in the working environment.Our study is in concurrence with study done by Dube KJ et al,among workers exposed to excessive levels of noise in ginning industries.

Bilateral SNHL was also reported high among study participants as noise trauma causes bilateral SNHL,which develops slowly over period of several years as a result of exposure to continuous or intermittent loud noise at the work place[2].

Other health problems like hypertension,sleep disturbances,headache were also reported high among study population compared to control population.This finding supports the occurrence of non auditory health hazards due to noise exposure.

V. Conclusion

The study shows the need of awaresness about occupational health hazards due to noise exposure.A regular medical examination,use of personal protective equipment and periodical maintainence of machines will be useful for protection of the workers from excessive noise prevailing at the work place environment.

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