

FREQUENCY OF EAR PROBLEMS AMONG CHERAT COAL MINERS

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ABSTRACT

Objective: To find the frequency of ear problems among Cherat coal miners.

Material and Methods: A cross-sectional study was conducted from October 2013 to March 2014 at Cherat. A sample size of 400 was selected through non-probability cluster sampling technique, in which the study area was divided into four clusters and then 40% coal miners were selected randomly. Coal miner's having more than six months of coal mining job were included while those with less than six months were excluded. A structured pretested questionnaire was used to collect data after that data was analyzed and presented in forms of tables and graphs.

Results: Results showed that approximately 29% of coal miners had history of ear problems. 62.93% were due to lack of training, 32.76% to early 1-4 years of coal mining job, 67.24% to less than 30 years of miner's age, and 67.24% for not using personnel protective measures.

Conclusion: The frequency of occupational ear problems showed strong relationship with age, duration of coal mining job, job satisfaction, coal mining training, knowledge regarding occupational safety and health practices, and with compliance of personnel protective devices.

Key Words: Ear Problems, Mining, Satisfaction, Training, Knowledge.

INTRODUCTION

Coal mining is considered as one of the dangerous occupation throughout the globe. Coal mining has been, and continues to be, a hazardous occupation with some of the highest rates of deaths, injuries and disabilities.¹ Worldwide coal mining is considered to be one of the dangerous occupation²; poses many health problems to coal miners and resulting in occupational morbidity and mortality.^{3,4} Severity of the working conditions, noncompliance of personnel protective equipments, lack of knowledge, and unhygienic working conditions were the main causes of various health problems. Noise exposure is prevalent in mining, and as the prevalence of noise-induced hearing loss has many consequences on workers.⁵

Noise is achieving dangerously alarming situation in all industries⁶ and causing problems due to work-related factors include occupational noise, whole body vibration, work-related diseases and toxic exposures.⁷ Age, duration of exposure, and sound level for 8-hour

Time Weighted Average has strong relation with ear disorders among coal miners.⁸ Miners' attitudes and behavior were important factors for wearing hearing protection devices.^{9,10,11} Coal miners were in close proximity to noises and thus at risk of developing hearing loss and thus were often exposed to high levels. Most underground work involves machinery which produces noise like; cutters, drills, transporting, loading and unloading etc.¹²

Occupational ear disorders continue to be the most prevalent disability in modern world. The National Institute of Occupational Safety and Health, noise induced hearing loss is still among the top ten work-related occupational health problems among coal mining.¹³ Noise induced hearing loss is a major health risk in all type of occupations. In Europe about 35 million people are exposed to detrimental noise levels (> 85 dB). Hearing loss is an insidious slow process that develops over a period of approximately 10 to 20 years. Accordingly to the latest estimations, more than 650,000 workers (of a total 5 million employed are put at risk.^{14,15}

Exposure to extremely noisy environments of 8 hours per day work > or =90 dB, is associated with injuries/ accidents. The severity of hearing impairment increases the relative risk of single and multiple events

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when threshold levels exceed¹⁵ dB of hearing loss.^{16,17} In a study, approximately 37% of coal miners complained regarding ear problems and the major complaint was hearing loss,¹⁸ while hearing impairment was 58.8%¹ and 90% of hearing deficit was reported after 55 years.¹⁹ Approximately 40% reported ear problems in a 5-year period and predominantly hearing loss was the most frequent ear problem; while in another study it was observed as 31% among coal miners and interestingly the prevalence of ear disorders increased significantly with their duration of exposure to unhygienic occupational environment and to high noise.^{18,19,20}

Pakistan, being a developing country, faces many problems and thus International Labor Organization and World Health Organization standards are not followed and thus poses a significant potential risk to coal miners. There are around 90 million of tons of coal in Hangu/Orakzai and Cherat/Nowshera, Pakistan.²¹ Coal miners of Cherat were one of the neglected sectors, and thus this cross sectional study was conducted to find the frequency of ear problems; and to assess its relation with various demographic variables among coal miners of District Nowshera Khyber Pakhtunkhwa Pakistan.

MATERIAL AND METHODS

This cross-sectional study was conducted from October 2013 to March 2014; among Cherat coal miners, District Nowshera, Khyber Pakhtunkhwa, Pakistan. Cherat is a hilly area located about 50 km from the District Peshawar, having a total of 80-90 coal mines and in them approximately 1000 coal miners were working. A study sample size of 400 was selected according to WHO sample calculation formula for 50% prevalence and 5% precision. Coal miners who have more than one year of job were included while those having less than one year job were excluded. The non-probability cluster sampling technique was followed in which the whole area was divided into four clusters i.e. Shakot, Jaba Tar, Jaba Khushk and Dak Ismail Khel, and then 40% miners were selected randomly. The coal miners having history of impaired hearing, ear block, ear discharge, ear pain and tinnitus/ Vertigo were used as a diagnostic criterion for ear problem/s. A structured questionnaire was formulated to collect data for important variables like age, duration of coal mining job, smoking history, job satisfaction, knowledge & training regarding occupational health and safety, and compliance of personnel protective equipments. Statistical Package for Social Sciences (SPSS) version 16 and Microsoft Excel software were used for data analysis and interpretation. Continuous variables were analyzed using means and standard deviations for

example: age etc; categorical variables were analyzed using percentages.

RESULTS

The demographics of the coal miners included in the study were: age distribution among 400 coal miners was analyzed as 5.25% miners were < 20 years, 36.5% miners were in age range 20-25 years, 17.25% miners were in age range 26-30 years, 12% miners were in age range 31-35 years and 29% miners were in age range 36 and above. Mean age was 30 years with standard deviation ± 1.26 . Twenty-eight percent of the coal miners had 1-4 years, 27.25% had 5-8, 17.75% had 9-12 years and 27% had 13 or more years of working experience in the coal mines. Mean job duration was 8 years with standard deviation ± 1.12 . Smoking status among 400 coal miners was analyzed as 72.25% miners' were smokers while 27.75% miners were not smokers. Out of all ear problems (n=166); 50% gave history of Impaired Hearing, 16.38% ear block, 6.03% ear discharge, 18.10% ear pain, while 9.48% of coal miners had complaint of tinnitus/or Vertigo.

DISCUSSION

Ear problems are one of the most common occupational problems experienced by the coal miners. The frequencies of ear problems are increasing and are mainly due to unhygienic occupational environment and noise during various mining activities. According to our study results, the frequency of ear problems among coal miners were 29% (n=116) while in international research studies the prevalence of hearing loss were calculated as 37%, 41% and 58.80%.^{1, 18,22} In our study, the highest frequency of ear problems as observed were impaired hearing 50% (n=58), followed by ear pain/ Otagia, and ear blockage while lower frequency were observed for tinnitus (n=11) and ear discharge (n=7) as. Coal miners are exposed to different kinds of noise due to the various operations in the coal mines; the hearing impairment was at the peak; 50% (n=58) and showed correlation with findings as reported in previous international studies.²³

Approximately 55.25% of the coal miners had 1-8 years of coal mining job and in these coal miners nearly 59.48% of coal miners gave positive history of ear problems; as revealed in previous national and international studies that there was strong relation between occupational ear problems in early and late years of coal mining job.¹⁴

Our study results revealed that frequency of ear problems were more prevalent in less than 30 years

ages i.e. 67.24%, and the percentage of ear problems above 30 years age groups were 32.76% while internationally the ear problems were approximately 30-43% among coal miners.^{18,22} Our results also show that frequency of ear problems were least prevalent in the younger age groups i.e. below 20 years age and between 30-35 years as compared to other age groups.

In our study, approximately 54.50% of coal miners were not satisfied with their coal mining job and 66.25% of coal miners had not any sort of training regarding coal mining safety measures; and thus having 57.76% and 62.93% of occupational ear problems respectively; and these relationships were also confirmed and supported in various international studies. In our study, 72.25% of the coal miners gave positive history of smoking and 35.34% of ear problems occur in these coal miners; and found that there was no strong relationship between high frequency of ear problems and smoking; which was supported by various international research studies. There was strong relation between high frequency of occupational ear problems and compliance of personnel protective equipments. In our study, 51.75% of coal miners did not follow the standard personnel protective equipments and thus among them 67.24% had history of occupational ear problems in past which was higher than the international rates of ILO and WHO.

As investigated in the national and international research studies, the frequency of ear problems were high and more in later years of coal mining job whereas in our study the frequencies were similar in all age groups although 20-25 years age group had highest percentage (42.24%). The prevalence of ear problems in less than 20 years age group almost doubled in the age ranges 30-35 as were revealed in various international.¹⁴

CONCLUSION

Lack of proper training of Coal miners is mainly the cause of occupational injuries especially ear problems.

RECOMMENDATIONS

Immediate remedial measures are needed from the Government and concerned departments to rectify the current situation. Beside, these measures pre placement and periodic medical examination; registration and coal miners education; compliance of personnel protect measures, and further research is needed to highlight the problem, so to avoid unnecessary morbidity and mortality associated with coal mining.

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