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THE PREVALENCE OF NOISE INDUCED HEARING LOSS AT A NICKEL MINE IN ZIMBABWE

ABSTRACT

BACKGROUND

Hearing loss from occupational exposures is a serious and widespread problem in underground nickel mining. This is a major contributor to compensable illnesses resulting not only in costly compensation but posing a serious threat to safety and also reducing the quality of working life.

OBJECTIVES

The objectives of this study were to identify the prevalence of noise induced hearing loss amongst underground nickel miners with at least 5 years of exposure as well as describe some risk factors for noise induced hearing loss in this occupational setting.

METHODS

One hundred and sixty eight underground nickel miners, or one hundred percent of eligible workers' medical records with baseline and periodic audiograms were reviewed to identify the prevalence of noise induced hearing loss and also evaluate some of the risk factors for noise induced hearing loss namely age, duration of exposure, use of oto-toxic agents, high ambient noise levels, hearing impairment, high pre-employment noise levels, history of acoustic trauma, history of ear injury and history of previous military, hunting or police work. One hundred underground mine workers were interviewed to give insight into their pre-employment noise exposure history, non-occupational noise exposure, perceived noise levels at work, knowledge of noise hazards and their control, and the use of hearing protection devices. One hundred and sixty eight workers were observed in their various tasks over a 14 day period and their work practices were scored to identify compliance to the use of hearing protective devices as well as confirm the presence or absence of oto-toxic agents like heavy metals and solvents. Data were analyzed using the EpiInfo software version 3.4.3: 1997 as well as the online statistical package Vassar Stats.

RESULTS

A noise induced hearing loss prevalence of 27.4% was identified with 42% being mild hearing loss, 28.8% moderate hearing loss and 28.8% moderate to severe noise induced hearing loss. The highest noise induced hearing loss prevalence of 60% was found in the 50 and above years age group whilst 45.5% was found in the 40 – 49 year age group, 20% in the 30- 39 year age group and 5.3 % in the 20 – 29 year age group. This difference was statistically significant ($\chi^2_1 = 19$ $p < 0.001$). Age with a $\chi^2 = 24$, $p< 0.002$ and duration of exposure with a $\chi^2 = 19$, $p< 0.001$ were found to be major determinants of noise induced hearing loss at the mine. Jackhammer operation and machine operation were found to be associated with noise induced hearing loss compared to the other tasks; Tukey's Honestly Significant Difference 0.05 = 12.23 $p<0.01$. The following risk factor was found to be related to noise induced hearing loss: use of quinine OR = 2.16 with CI 95% = 0.12 – 1.72. Ninety seven percent of the workers confirmed exposure to high noise levels. The knowledge of noise induced hearing loss at the mine was high (85%). Compliance with the use of hearing protective devices was found to be low with optimum usage only being achieved during the last 4 days of the 14 day observation period.

CONCLUSIONS

These findings attest to the relatively high prevalence of noise induced hearing loss at the mine. It can also be concluded that though the knowledge of noise induced hearing loss is high, the effective use of hearing protection still needs improvement through the implementation of comprehensive hearing conservation programs which adequately screen workers at pre-employment stage as well as consider the workers' perceived knowledge, attitudes as well as practices in an occupational setting.