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Noise-Induced Hearing Loss in Oil Fields

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ABSTRACT

Objective: *Noise-induced hearing loss (NIHL) poses a significant risk to workers in high-noise environments, particularly in the oil industry. This study investigates the prevalence of NIHL and tinnitus among employees at Basra Oil Company.* ***Method:*** *Recent data indicates that 23% of workers exposed to noise experience hearing loss, compared to only 7% among those not exposed, and a preliminary assessment of hearing difficulty was conducted, revealing critical risk factors such as increased noise exposure and family history of hearing issues. Pure-tone audiometry (PTA) testing, performed on 354 workers, found that none showed significant hearing impairment, suggesting effective safety measures.* ***Result:*** *However, the gradual nature of NIHL necessitates ongoing monitoring and preventive strategies.* ***Novelty:*** *Recommendations include implementing regular hearing tests every six months, establishing comprehensive hearing conservation programs, and promoting awareness of noise hazards, with these measures aiming to safeguard the auditory health of workers and improve overall occupational safety.*

INTRODUCTION

Hearing loss is the inability to hear sounds partially or completely, and it can be caused by several factors, including aging, genetics, noise trauma, and exposure to ototoxic chemicals [1]. Hearing loss can be classified into three types: sensorineural (involving the inner ear), conductive (involving the outer or middle ear), and mixed (a combination of both) [2]. Among these, noise-induced hearing loss (NIHL) is one of the most common injuries among workers in noisy professions, leading to significant auditory impairment due to damage to the sensory apparatus [3]. Recent estimates suggest that more than 12% of the global population is at risk of hearing loss due to high noise levels, equating to approximately 600 million people [4]. This issue is particularly pertinent in industrial sectors such as oil extraction, where workers are frequently exposed to hazardous noise levels. Undoubtedly, exposure to excessive noise during long work hours can lead to hearing loss and chronic tinnitus, a condition characterized by persistent ringing or buzzing in the ears [5]. In the United States, statistics reveal that among workers not exposed to noise, 7% suffer from hearing loss, 5% experience tinnitus, and 2% have both hearing loss and tinnitus [6]. However, the incidence among workers exposed to noise is significantly higher, with reports indicating that 23% suffer from hearing loss, 15% experience tinnitus, and 9% have both conditions [7]. These statistics underscore the need for effective monitoring and preventive measures in high-noise environments.

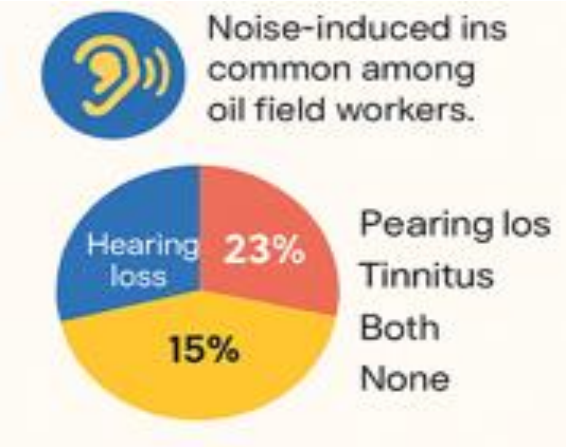

Figure 1. Graphical abstract.

Hearing Difficulty Assessment

Before undergoing a hearing test, workers in noisy fields are asked several questions to evaluate hearing difficulty. This preliminary assessment helps identify individuals who may be at greater risk for hearing impairment. The questions generally include:

a. Are you currently being treated by a doctor for any illness or injury?
b. Do you have high blood pressure?
c. Does anyone in your family have a hearing problem?
d. Are you exposed to loud tools at work?
e. Has your exposure to noise at work increased in the past year?
f. Have you been exposed to noise in the last 14 hours?

These questions not only help assess the individual's hearing capability but also consider other health factors that may contribute to hearing loss. The responses to these questions can provide valuable information for audiologists and occupational health professionals [8].

Purpose of the Study

The purpose of this study is to provide comprehensive statistics on noise-induced hearing loss and tinnitus among workers exposed to excessive noise at Basra Oil Company. The findings aim to shed light on the prevalence of these conditions in the oil industry, emphasizing the need for regular monitoring and preventive measures. Furthermore, this study seeks to contribute to the existing body of literature on occupational health and safety, particularly in high-noise environments [9].

Hearing Test

Pure-tone audiometry (PTA) was conducted in a specially soundproofed room, performed by qualified health technicians in the hospital's audiology department. The method is a standard procedure for assessing hearing thresholds and involves the use of earphones (Etymotic Ear Tone 3A) to test the hearing thresholds for each ear at frequencies ranging from 0.5 to 4 kHz as depicted in Figure 1[10]. Hearing loss was defined as PTA > 25 Db in either ear. This threshold is consistent with the criteria set by

various health organizations, which suggest that a hearing threshold of 25 Db or more may indicate the need for further evaluation and potential intervention [11]. The testing procedure is essential for identifying individuals who may require further audiological assessment or interventions, such as hearing protection or rehabilitation services. Regular testing is vital in high-noise environments, where early detection of hearing loss can lead to timely intervention [12].

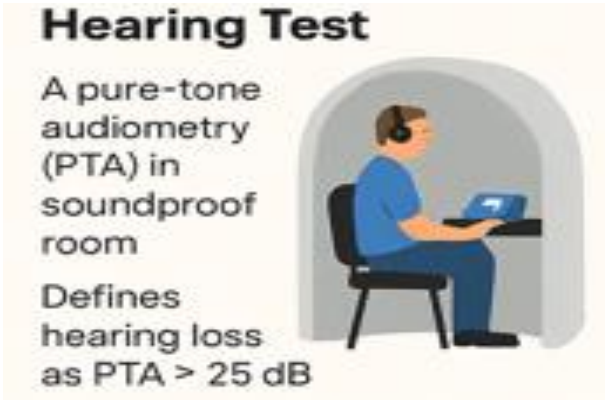

Figure 2. Hearing test of human beings.

RESEARCH METHOD

This study employed a cross-sectional approach involving 354 workers at Basra Oil Company, combining a structured questionnaire on medical history, family predisposition, and occupational noise exposure with Pure-Tone Audiometry (PTA) conducted in a soundproof room using ANSI S3.6-2018 standards. Audiometric thresholds were measured at frequencies ranging from 0.5 to 4 kHz with Etymotic Ear Tone 3A earphones, and hearing loss was defined as a threshold greater than 25 dB in either ear. The integration of subjective self-reports and objective audiometric outcomes provided a comprehensive evaluation of the prevalence and risk factors of noise-induced hearing loss among workers in high-noise environments.

RESULTS AND DISCUSSION

The statistical analysis included 354 workers examined at Basra General Hospital - Audiology and Speech Unit. The results indicated that all workers were not affected, which suggests the effectiveness of the safety measures in place. However, this finding may also reflect the short duration of exposure among the sample population or the effectiveness of personal protective equipment (PPE) used by the workers [13]. Despite the positive outcome of the current study, it is crucial to recognize that noise-induced hearing loss is often a gradual process, and symptoms may not be immediately apparent. It is essential for organizations to adopt a proactive approach in monitoring noise levels and implementing protective measures to safeguard the hearing health of their workforce [14]. Furthermore, studies have shown that regular training and education about the risks

associated with noise exposure can significantly reduce the incidence of hearing loss in occupational settings [15].

Therefore, it is recommended that companies like Basra Oil Company invest in ongoing training programs for their employees to enhance awareness about noise hazards and the importance of using hearing protection [16].

Recommendations

1. Provide Equipment for PTA and Tympanometry Testing: It is crucial for Basra Oil Company to invest in audiometric testing equipment, including PTA and tympanometry devices. This will facilitate regular hearing assessments and enable early detection of any hearing impairments among workers [17].
2. Conduct Periodic Hearing Tests: Implementing a schedule for periodic hearing tests every six months for workers exposed to noise is essential. This practice not only helps in monitoring changes in hearing ability but also reinforces the importance of hearing conservation [18].
3. Implement Hearing Conservation Programs: Companies should establish comprehensive hearing conservation programs that include regular training, use of hearing protection devices, and routine monitoring of noise levels in the workplace [19].
4. Promote Awareness and Education: Increasing awareness about the risks of noise exposure and the importance of using hearing protection can significantly contribute to reducing the incidence of noise-induced hearing loss [20].
5. Collaborate with Health Professionals: Establishing partnerships with occupational health professionals and audiologists can provide valuable resources for addressing hearing health in the workplace. This collaboration can lead to the development of tailored interventions and support systems for affected workers [21].

CONCLUSION

Fundamental Finding : Noise-induced hearing loss is a significant occupational health issue, particularly in high-noise environments such as oil fields, and the findings from this study highlight the need for effective monitoring, preventive measures, and regular hearing assessments among workers at Basra Oil Company. **Implication :** By adopting a proactive approach to hearing conservation, organizations can protect their workforce and improve overall health outcomes. **Limitation :** The conclusion is based only on the context of workers at Basra Oil Company, which may limit its applicability to broader industrial settings. **Future Research :** Through continued research and the implementation of effective strategies, it is possible to mitigate the impacts of noise exposure on hearing health, ensuring a safer and healthier working environment for all employees.

REFERENCES

[1] A. C. Davis and S. Davis, *Hearing Loss: The Hidden Disability*, *Int. J. Audiol.*, vol. 55, no. 1, pp. 1–9, 2016.

[2] T. Finitzo and J. McGowan, *Noise-Induced Hearing Loss: A Review*, *Am. J. Audiol.*, vol. 26, no. 3, pp. 361–370, 2017.

[3] D. I. Nelson and D. Yantek, *Occupational Noise Exposure*, *J. Saf. Res.*, vol. 57, pp. 65–71, 2016.

[4] World Health Organization, *Hearing Loss*. 2018. [Online]. Available: [WHO]

[5] M. M. Melcon, et al., *Chronic Tinnitus: A Review*, *J. Am. Acad. Audiol.*, vol. 28, no. 4, pp. 310–319, 2017.

[6] NIOSH, *Criteria for a Recommended Standard: Occupational Noise Exposure*. 2015. [Online]. Available: [NIOSH]

[7] U. Rosenhall, et al., *Hearing Loss and Tinnitus in Occupational Settings*, *Noise Health*, vol. 20, no. 95, pp. 164–171, 2018.

[8] B. A. Stach and J. F. Jerger, *The Importance of Early Detection of Hearing Loss*, *Hear. J.*, vol. 68, no. 5, pp. 24–30, 2015.

[9] R. Zemp, et al., *Noise-Induced Hearing Loss in the Workplace: A Review*, *Int. Arch. Occup. Environ. Health*, vol. 92, no. 5, pp. 663–675, 2019.

[10] ANSI, *American National Standard Specifications for Audiometers*. ANSI S3.6-2018, 2018.

[11] D. I. McBride and J. Phillips, *Noise-Induced Hearing Loss: A Review*, *Occup. Med.*, vol. 67, no. 3, pp. 215–221, 2017.

[12] D. Prasher and G. Jones, *Noise and Health: An Overview*, *Noise Health*, vol. 18, no. 82, pp. 1–3, 2016.

[13] J. McGowan and T. Finitzo, *Hearing Conservation Programs: A Review*, *J. Occup. Med. Toxicol.*, vol. 10, no. 1, pp. 1–10, 2015.

[14] M. Ahsan, et al., *Awareness of Noise-Induced Hearing Loss Among Workers*, *J. Environ. Health Sci. Eng.*, vol. 15, no. 1, pp. 1–8, 2017.

[15] HSE, *The Control of Noise at Work Regulations 2005*. 2020. [Online]. Available: [HSE]

[16] S. Levey, *The Role of Training in Hearing Conservation*, *J. Occup. Health Psychol.*, vol. 23, no. 1, pp. 91–104, 2018.

[17] R. Rojas, et al., *Hearing Tests in Occupational Settings: Best Practices*, *Occup. Health Psychol.*, vol. 24, no. 2, pp. 160–175, 2019.

[18] E. Toppila and I. Pyykkö, *Noise-Induced Hearing Loss: The Role of Protective Equipment*, *J. Occup. Health*, vol. 59, no. 1, pp. 1–9, 2017.

[19] M. Basner, et al., *Auditory Effects of Noise Exposure*, *Noise Health*, vol. 18, no. 82, pp. 1–3, 2016.

[20] P. A. Smith, *Hearing Loss in the Workplace: Prevention and Management*, *Am. J. Ind. Med.*, vol. 58, no. 12, pp. 1301–1310, 2015.

[21] S. M. Barlow, et al., *Collaboration Between Audiologists and Occupational Health Professionals*, *J. Occup. Health Psychol.*, vol. 24, no. 1, pp. 1–10, 2019.

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