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Noise Induced Hearing Loss Dentist

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Abstract

One of the most important issue in the contemporary world that required solution is noise pollution, it has been identified by the national institute for occupational safety and health as one of leading causes of work-related injuries and disease (3). dental professionals in dental office environment subjected to regular basis of different level of noise, that associated with hand pieces, ultra-sonic as well as other dental instrument and equipment, those instrument sounds and noises considered as real occupational hazarded that need to be taking seriously, since continues expose to noise lead to permanent hearing loss and once the damage occurs hearing loss become irreversible problem with no medical cure. The fact that hearing problem among dental professional due to noise sounds of dental instrument have been proved in many worldwide studies and research. This paper we will address the lack of occupational safety measure in KSA to prevent NIHL due to dental instrument noise through critical reading of listed reference.

Worldwide NIHL consider as important occupational hazard, evidence by global studies have been proven the positive relationship between dental instrument noise and hearing problem ,all of the studies point out the importance of prevention , lack of studies and research among dental professionals in Saudi Arabia does not reflect the importance of this occupational risk ,its only reflect the lack of knowledge and awareness of the problem which as consequence will impact the prevalence and prevention in KSA.

Keywords: Hearing Loss, occupational hazard, dentist, KSA. dental instrument sound, NIHL, dental hazard, preventive measure.

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Introduction

One of the most important issue in the contemporary world that required solution is noise pollution, it has been identified by the national institute for occupational safety and health as one of leading causes of work-related injuries and disease [1]. dental professionals in dental office environment subjected to regular basis of different level of noise, that associated with hand pieces, ultra-sonic as well as other dental instrument and equipment [2], those instrument sounds and noises considered as real occupational hazarded that need to be taking seriously, since continues expose to noise lead to permanent hearing loss and once the damage occurs hearing loss become irreversible problem with no medical cure [3].

The importance of noise in dental clinic as occupational health issue: The fact that hearing problem among dental professional due to noise sounds of dental instrument have been proved in many worldwide studies and research. There are many consequences of hearing loss on individuals social, psychological and economic aspect of their life such as social isolation that

causes reduce quality of life ,impaired communication with public ,co-worker and family member ,wearing equipment sound will diminished ability to monitor the work environment, impaired communication lead to lost productivity and increase accident ,as well as expense for workers compensation and hearing aids[4,5] in some countries like united states ,the Occupational Safety and Health Administration (OSHA), require the employers to implement and develop noise monitoring program ,that requires the employees to maintain an audiometric testing if the they exposed to noise exceed or equal to 85db over 8 working hours and demand the employers to provide hearing protection to their employees[6].

Why this occupational health issue is important in Saudi Arabia: In Saudi Arabia lack of studies regarding this health issue in dental filed reflect the degree of awareness of the problem among dentist and dental auxiliary, that lack of knowledge will have its impact on addressing, controlling and preventing this occupational hazard.

Aim

In this paper we will address the lack of occupational safety measure in KSA to prevent NIHL due to dental instrument noise.

Method

The content of this paper is drowning from critical reading of listed reference. Two methods used in combination 1- computerization search on appropriate key words using Google scholar, pub med.2- king Fahd and King Saud University library. Key words: Hearing Loss, occupational hazard, dentist, KSA. dental instrument sound, NIHL, dental hazard, preventive measure.

Result

Since the use of high-speed hand piece, concern have been reported and expressed in literature of the relation between hearing loss and dental hand piece and other dental equipment. In 1959 American dental association council on research in dentistry confirmed that dentist should monitor their hearing by doing hearing test especially if they are using high speed drills, in 1962 report was published by Schubert and Gloring suggesting that prolong exposure to sound will lead to permanent damage to inner ear structure that is too weak to produce pain [7]. Investigation have been done about impaired hearing among dental professionals by several authors, Weatherton et al 1972 point on the marked difference in hearing test between dental student and dental faculty in University in Tennessee [8]. Zubick et al in1980 address that dentists have lower hearing threshed levels than physicians[9].Coles and Hoare 1985 found two NIHL cases in dentistry[1] .In 1992, Merrell and Claggett reported that individuals who are susceptible to NIHL are exposed to harmful noise level they will probably suffer from Noise Induced Hearing Loss through their life time, they also recommended dentist to do regular haring test and ear protective device[5].In 1995,Fabry investigate whether dentists in greater risk of developing hearing loss ,and he come out with case-effect relationship the using of dental drill and hearing loss [2].Unfortunately there is limited number of published studies in Saudi Arabia regarding hearing problem among dental professionals , Alwazan and Al Ghahtani in 2005 conduct a study on determine the prevalence of hearing loss on dental personals ,the finding of this study evidence the presence of tinnitus ,difficulty in speech dissemination ,difficulty of speech dissemination in back ground noise ,they point out the importance of using protective ear device and routine hearing test was reported[4].

It isafactthat noise induced hearing lossisworldwide occupational health hazard among dental professionals, Since1959 Concern was raised on Noise Induced Hearing loss among dental professionals due to dental instrument. Several studies have been conducted to investigate the effect of noise sound of dental instrument on inducing hearing loss among dentist , Weather tone ,Melton in 1972, conduct eudiometrical test on 30 faculty member and dental student in university of tiennessess on studying the effect of dental drill noise on the hearing of dentist, they found markedly difference in hearing level between the two groups ,this finding provide cause-effect relationship between long exposure of noise sound of dental instrument and hearing loss .Similar finding were suggested by Zubik et al in 1980 when he compare hearing loss between physician and dentist by conducting eudiometrical evaluation on 137 dentists and 80 physicians ,the author point out that physicians have better hearing threshold than dentists

,they also study the hearing loss on right-handed dentist and physician and left ear hearing loss ,the result was right handed dentists have hearing loss more in their left ear, where there is no different among physician , according to that they conduct that left ear that is near to the drill are exposed more to "toxic noise" damage which indicate strong specific effect between noise and hearing loss .Another study support this strength association was reported by February 1995 when he study the relationship between dental drill and hearing loss .

All of the studies have evidenced the strong correlation, specify of noise as risk factor also explained the biological gradient and plausibility of NIHL. In every study the recommendation of doing annual eudiometrical test and wearing hearing protective device was established.

In Saudi Arabia 2005 Alwazan study, the only study of its kind in KSA, come cross the association between dental profession and hearing problem, the candidate of the study was 204 dentals professional, technicians, dentist, dental assistance, the highest prevalence of hearing problem was found among technicians by 31% tinnitus and 34% difficulty in speech discrimination, followed by dentists by 15.38% having tinnitus and 32.9% difficulty in speech discrimination in back ground noise. The study suggested that intensity of the noise and duration of exposure will incense the incidence of hearing problems among dental personal, hearing can happen due to dental field, dental technician are the most prone to hearing problem, similar finding was reported in Bander M study in 2016.NIHL can be either temporary or permanent, according to exposure duration ,short exposure duration courses temporary NIHL ,while long term exposure courses permanent damage , tinnitus which is sensation of noise that last for seconds ,hours or days ,that noise can be on either both ears on one ear as hissing ,pulsating or ringing sounds. Based on the fact that that exposure to noise can cause hearing loss if exceeded 85db (decilabal), The resource of sound in dental clinic that can be consider as

potantianally damaging to hearing are low speed hand piece, high speed hand piece, high velocity suction, vibrators, mixing device, ultra-sonic instrument and model trimmers. list of decilabal rating was established by Kilpatrick for various office equipment and instrument [4]. inducing hearing loss among dentist , Weather tone ,Melton in 1972, conduct eudiometrical test on 30 faculty member and dental student in university of tiennessess on studying the effect of dental drill noise on the hearing of dentist, they found markedly difference in hearing level between the two groups ,this finding provide cause-effect relationship between long exposure of noise sound of dental instrument and hearing loss .Similar finding were suggested by Zubik et al in 1980 when he compare hearing loss between physician and dentist by conducting eudiometrical evaluation on 137 dentists and 80 physicians ,the author point out that physicians have better hearing threshold than dentists
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The most critical fact in this issue is the fact that dentist will not realize there hearing problem until they loss 28 to 30% of their hearing, and when they seek for treatment, there is not any medical treatment. With the presence of all those facts from worldwide studies, still the number of dentists who use ear protective device and do routine hearing test are very limited, according to Alwaszan in 2005 point out that none of the dental profession and student use ear plugs or conduct annual hearing test. Important question should be raised here, why there is underestimation of noise as occupational health risk? Why the Occupational Safety and Health Administration (OSHA) regulation regarding Noise monitoring program have not been applied in dental clinic in KSA? is it due dental professionals lack of knowledge! or is it the awareness of hearing problem is not recognizes due to the silence and pain less nature of hearing loss, as we mentioned before the dentist will not be aware of the problem until he loss 30% of his hearing.

This lack of knowledge is due to thelimited studies KSA ,nearly rare regarding noise as occupational risk ,actually many dentists do not even consider or know that noise is occupational hazard and the fact it causes Noise Induced Hearing Loss, as reported in Alwazan study 2005,however, they keep on complaining of the noisy sound of dental instrument ,difficulty in communicating with patient while working and titin use , the magnitude the problem not yet established in Saudi Arabia, the important and complication of this occupational hazard in dental work field have not been explore.

Noise is dental occupational risk like infection, radiation, neck and back pain, needle stick injury and others occupational health risk which have been taken seriously in working dental environment the difference is hearing loss is silent disease, that's what make it even more important. As dentists the exposure to noise from dental instrument is daily based mater, since most of dental work is based on the use of these equipment, with duration that last from 7 to 9 hours daily, this intensity and long duration exposure will increase the risk of developing hearing problem.

Conclusion

Worldwide NIHL consider as important occupational hazard, evidence by global studies have been proven the positive relationship between dental instrument noise and hearing problem, all the studies point out the importance of prevention, by recommending wearing hearing protective bulge and doing annual hearing test. lack of studies and research among dental professionals in Saudi Arabia does not reflect the importance of this occupational risk, its only reflect the lack of knowledge and awareness of the problem which as consequence will impact the prevalence and prevention in KSA.

Recommendation

There is many recommendations and solution to reducing the noise in working environment and protect hearing, this can be achieved by:

• Educating programmers to the dentist and dental staff about the importance of the affect of noise that generates from dental instrument on their hearing.

• Avoiding the use of several turbines in the clinic or working environment.

• Use of high -quality equipment.

• Maintaining proper distance from the operating field, the distance recommended from the patient mouth and dentist eye is 14-inch decibel.

• The instrument should not be activated unless they are ready to be used.

• Correct manipulation procedure between dentist and auxiliary staff should be applied to reduce the level of noise.

• Planning for daily work schedules to control the uses of instrument.

• Wearing ear plug muffs to provide adequate protection.

• Annual hearing test should be done by dental staff.

• For assisting later change in the ear, hearing test should be taken at the beginning of professional career by student and young doctors.

• Theirs still urgent to explore the prevalence of this occupational hazard in KSA.

References

1. Finkbeiner, B. L., & Finkbeiner, C. A. (2019). Practice Management for the Dental Team E-Book. Elsevier Health Sciences.
2. Vincent, C., Taylor-Adams, S., & Stanhope, N. (1998). Framework for analysing risk and safety in clinical medicine. Bmj, 316(7138), 1154-1157.
3. Lusk, S. L., Ronis, D. L., & Hogan, M. M. (1997). Test of the health promotion model as a causal model of construction workers' use of hearing protection. Research in nursing & health, 20(3), 183-194.
4. White, G., & Louie, G. J. (2005). The audio dictionary: revised and expanded. University of Washington Press.
5. Zehnder, M. (2006). Root canal irrigants. Journal of endodontics, 32(5), 389-398.
6. Powers, J. M., & Wataha, J. C. (2014). Dental Materials-E-Book: Properties and Manipulation. Elsevier Health Sciences.
7. Sakakibara, S., Flynn, B. B., & Schroeder, R. G. (1993). A framework and measurement instrument for just-in-time manufacturing. Production and Operations Management, 2(3), 177-194.
8. Abel, Sharon M., and Nadine M. Armstrong. "The combined sound attenuation of earplugs and earmuffs." Applied Acoustics 36, no. 1 (1992): 19-30.
9. Meshram, Suresh, Roshan Kumar, and Palwinder Kaur. "Hearing damage control for dental personnel!." JIDA: Journal of Indian Dental Association 9, no. 1 (2015).
10. Duchscher, Judy Boychuk. "A process of becoming: The stages of new nursing graduate professional role transition." The Journal of Continuing Education in Nursing 39, no. 10 (2008): 441-450.
11. Hadadi, A., Afhami, S., Karbakhsh, M., & Esmailpour, N. (2008). Occupational exposure to body fluids among healthcare workers: a report from Iran. Singapore medical journal, 49(6), 492.