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ORIGINAL ARTICLE

The Study Of Iran-Iraq War's Victim Ears Findings In The Golestan Province [Gorgan – Iran]

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Abstract

Background and aim: Ear as vestibule auditory system can be damaged by many cases. The Army personals whom are exposed to many traumas, the ear can also be traumatized subsequently but many of the injuries to the ears are irreversible. Due to the eight years of war in Iran and as far as there is not any study in Golestan Province about such an abnormality, this research was done for the determination of common findings in Golestan province about war victims, ear's problems.

Material and Methods: This is a descriptive cross-sectional field study on 256 war victims of Golestan province which were chosen by randomized sampling. Hearing loss tinnitus, othorea, vertigo, tympanic membrane perforation audiologic findings and the type of trauma were considered. B.C over than 15dB considered as hearing loss. Hearing loss were divided in few groups and the questionnaire was filled for all of the sample population. Data were analyzed by SPSS soft ware and exact Fisher test.

Findings: In this study the sample population were exclusively male subjects, 21.5% complained from audiologic problems. 94.6% had hearing loss, 83.6% tinnitus without hearing loss, but there was a hearing loss on the audiologic findings. 80% of hearing loss was bilateral, 10.9% on the Wright and 9.1% on the left side. 89% of hearing loss was sensory neural 88% in high frequency. The intensity in 48.5% of sample population was 15-30dB, 6.4% of them had tympanic membrane perforation only in 3.6% of them othorea, was observed none had complained of vertigo.

Discussion: Also the war itself was stopped many years ago but the hearing abnormality still is a common problem among the war victims. Therefore it seems although necessary to look for manufacturing the sound protective instruments, but at the same time proper training are required for those army personals which are practically present actively in the war front and surrounding area. On the condition where the sounds can cause reversible lesions the health care personal should be ready to look after of those victims. Also the risk factors should be omitted and at the same time the remaining hearing in the war victims are to be preserved.

Key Words: Hearing loss, War trauma, War victims

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Introduction

The ears as a vestibule auditory system while containing sound stimulator and protective mechanism, still can be susceptible toward some specific sounds [1]. The different parts of ear also are injured by various forms of trauma [2,18]. Loss of hearing due to Noise Induced hearing loss[NIHL] is the reason for visiting the ENT specialists at least by 10 millions annually in USA [3,4]. NIHL can be produced in two types, it is either reversible loss which is happened by facing the sudden hight, low explosion or permanent threshold shift [PTS] which is caused by continuous contact with moderate sound level. The former type of hearing loss can be improved in few minutes or few days if the ears are not faced the other sounds [5,6]. The irreversible hearing loss can be accompanied with others findings such as tinnitus [7,8]. In occupational sound trauma in both ear there is similar threshold, but in the right- handed soldiers the left ear is more at risk of hearing loss [6].

The ear's permutable level of sound is clearly well defined [9], so the sound over this threshold is obviously harmful to the ear [9]. The balanced system is also can be damaged by the sound, but for such abnormality the heavier sounds are needed. The sound trauma are happening gradually, therefore the balancing incidence, occur rarely and there is some controversy in this area [10,11]. The ear and its belonging can be traumatized by damages and temporal bone fracture[5,19].

In the war front where the combatants are faced with various types of sounds trauma, due to explosion, a quiver and bullet, the ears are among the more susceptible, organs. Bearing in mind the above facts, the eight years of Iran-Iraq war and the importance of recognizing the ear's symptoms among the war victims and due to not having any documented study in the Golestan Province in the Islamic republic of Iran, this present study was designed to investigate the ears abnormalities findings among the war victims in this province.

Material and Methods

This field study is a descriptive cross-sectional study with the aim of analytical investigation on the basis of available documented findings in the alive war victims medical file.

On the basis of primarily study the sample population were found to be 256, persons using the equation $n = \frac{Z^2 1-\frac{\alpha}{2} P(1-P)}{d^2}$

where d=0.1, $\alpha = 0.05$, P=0.8

The patients were chosen by randomized sampling using the war victims' files in the Golestan Province. The ENT specialist was responsible for the medical examination on the proposed items in this investigation. The war victims complain from hearing loss, tinnitus. Othorea, vertigo tympanic and membrane perforation audiologic findings were obtained from the war victims files. The sample population were faced various types of traumas. The major traumas, which was also was a matter of consideration by the war victims themselves was the basis for this research, and in this regards, those victims which were experienced the direct bullet or aquiver were not selected to participate in this study. The level of hearing loss was sub-divided in three groups. Pattern of audiogram, of the affected ears and the type of tymponogram were recorded.

In this study the determination thresholds for the hearing loss was considered when the level of bone conduction was above the 15dB [12]. The intensity of hearing loss was also sub-grouped in few divisions.
The war victims were sub-graded according to the patients medical history also the ENT specialist determination and the documentation availability , therefore the war victims with hearing loss outside the war front were omitted from our study. The war victims which were not interested to participate in this study also were not considered in this research project.
The gathered information were analyzed using SPSS software. The data were expressed by Figures and Tables and the confidence ratio was considered to be 95% [$\alpha = 0.05$)

War victims complain	Number	Percentage
Tinnitus + hearing loss	43	78.2
Hearing loss	9	16.4
Tinnitus	3	5.4
Total	55	100

[Table/Fig 1]- The incidence of various types of ear complain among war victims in Golestan Province

Complain	Number	Percentage
Right ear	6	10.9
Left ear	5	9.1
Bilateral	44	80
Total	55	100

[Table/Fig 2]: The incidence of afflicted ears among the war victims.

Results

In this study 256 war victims were gone under investigation 55persons of the sample population complained about ear problems. Therefore 21.5% our war victims in this study had an ear abnormality, from the total of 55 with hearing loss complain we had the following findings: hearing loss [9 cases], tinnitus [43 cases], Tabel-1. In such cases when the audiograms results showed the presence of hearing loss, but went unnoticed by the war victims, it was due to tinnitus, which was the main trouble for the war victims.
From the 55 war victims with hearing abnormalities, 7 patients had tympanic membrane perforation, 4 case and 3 case had problems on the right ear and left ear respectively, from this 7 cases, 4 war victims were suffered from othorea. From the 55 patients, with hearing abnormalities 6 patients had difficulty in the right ear, 5 cases with the left ear, and 44 persons in both ears.
On other hand from 512 ears, which were studied in this research project. 99 ear had the hearing problems Table-2

The type of hearing loss were as follows sensory neural 98 case [89%], conductive 6 cases [5.5%], mixed types of abnormalities 6 cases [5.5%].
Patron audiograms showed at high frequency [in 88%] of cases 12% were flat, and none of our patients had hearing loss in low frequencies. The intensity of hearing loss in 48.5% war victims were between 15-30 dB, in 32% of cases 30-60 dB, and in 18.5% of cases were more than 60 dB. The type of tympanograms in 91.4% of cases were type A, 6.4% type B, and in 2.2% type C respectively .
The traumatized cause of ear abnormalities in 68% of cases were wave explosion, in 3.1% quiver and in 28.9% of cases, combined wave explosion and a quiver. In this study each of our sample population at some points were contacted the noise from the heavy war equipment and some chemical agents.
None of the war victims in this study had complained about vertigo.

Discussion

In this study, 55 patients [21.5%] from 256 war victims complained about the ear

problems. Out of this 55 patients, 52 war victims [94.3%], 3 patients [5.4%] suffered from hearing loss, and tinnitus without hearing loss respectively. In addition it should be mentioned, that, the audiograms findings showed those subjects with tinnitus also had a degree of hearing loss so, therefore as whole, every war victims in this study [100%] considered to have hearing loss.

The findings from this research is consistent with the results from other research project which carried out in EU during 1967-1968, on 147 soldiers whom had ear abnormality caused by explosions, and other study on the soldiers took part in the Bosnia war[12] .According to our available data it seems that there is not hearing loss study on the war victims in the country, but in a study on the healthy subjects in Mashhad the capital city of Khorasan province in the north-east of the country, 5.3% of people were found to be with hearing loss[13]. In the present study 80% of the patients with hearing loss, had this abnormality in both ears, which is in agreement with the recorded references [14]. In this study 10.9% and 9.1% of cases had the abnormality in the right and left ear, respectively. This does not have any meaningful statistical correlation. There are some study reflecting that right-handed and left-handed soldiers are facing different ear problems [6]. This differences can be due to the volume and consistency of sound trauma which hit the combatant in the war front. In our study 83.6% of patients whom complained about ear problems, had the tinnitus as an abnormality. In a study on 147 soldiers in Western countries during 1967-1968 with ear abnormality due to the explosion, 60% were seen with tinnitus, which is lower incidence compared to our results [12]. The types of hearing loss in 89% of our cases were sensory neural which is in agreement with, other study [12]. In this study also 88% of cases with hearing loss had the problem in high frequencies. Non of the cases had hearing loss in low frequencies, which is in agreement with other study [6]. The intensity of hearing loss in 48.5% of cases were about 15-30dB, and tympanograms in 91.4% of cases were type A which is in agreement with other study [14]. In this study 6.4% of ear were seen with tympanic membrane rupture. In other studies in Western countries [12] 70%, Saudi Arabia [15] 70%, and in London [16], 62% of the patients were reported to have tympanic ruptured membrane respectively.

The reason for high incidence of tympanic membrane perforation in those studies may be due to much shorter duration between the time of explosions and soldiers having ear problem and the time of investigation on such soldiers. It should be mentioned that tympanic membrane ruptures gradually were healed [17]

In this study only 3.6% our sample population were seen with otheora, which is lowered compared to other study [12]. This difference also can be either due to shorter time of between the time of explosion with subsequent hearing abnormality and with time of soldier's ear clinical examination, or due to improved health preventive measures of governmental organization responsible for the war victims, in Iran.

In this study true vertigo was not considered to be adaptation to vestibule-auditory system, it should be noticed that high intensity sound required for the clinical system of vestibilator [14].

In regard to the findings from this study and also due to the prevalence and consistency of ear problems among the war victims, even many years after the war cessation itself, we conclude, that effort toward manufacturing sound preservative instrument and the other proper training for the combatants in how to use such facilities in the war front, and also when the hearing loss of the combatant is in Temporary Threshold Shift phase, sound resting state should be observed, as preventive measures to protect the remaining hearing, also at the same time the possible risk factors should be omitted and taken into consideration. The periodical control also should be arranged to protect the remaining hearing in such war victims with hearing loss.

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