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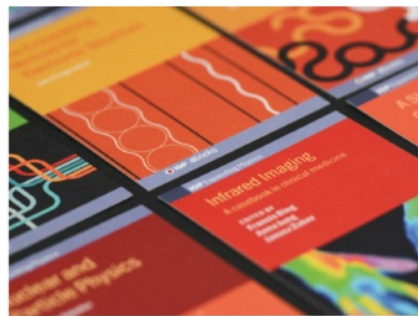
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Picture of Hearing Health with Exposure to Environmental Noise on Boat Ketek Riders in Region of Ancol Tanggo Rajo Jambi 2017

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Abstract. Hearing loss is a term used to describe hearing loss in one or both ears. Normally the human ear can hear a 20 - 20000 Hz frequency with an intensity below 80 dB. If a person continually hears a sound above the normal threshold, it will damage the function of hair cells resulting in hearing loss. Hearing loss is a problem most commonly encountered in workers who work in environments with high levels of noise. The diagnosis can be confirmed with audiometry test. This study aims to see a picture of hearing health of ketek driver in Ancol Tanggo Rajo Jambi City. This research is a descriptive cross sectional study. The sample was taken by random sampling. This research was carried out at harbor boat ketek Ancol Tanggo Rajo Jambi City on October 2017. The samples were taken from the population of ketek driver as many as 30 people. The characteristics of ketek driver are in the >35 years age category were 29 people (96.7%), driver ketek who work 10 years are 26 people (86.7%). The result of audiometry test were 30 patients (100%) with Hearing Loss. The most type of hearing loss is Noise Induce Hearing Loss with 15 people (50%), followed by Conductive Hearing Loss with 9 people (30%), Sensorineural Hearing Loss with 3 people (10%), and Mix Hearing Loss with 3 people (10%).

1. Introduction

Hearing loss is the most common problem in workers working in high-noise environments, such as workers in industrial estates including mining, exploration (e.g. drilling), shipping, aviation, textile machinery and testing of machines jet. This will be very detrimental to the workers because it can cause permanent threshold shift. So, it is necessary to do early detection of hearing loss to prevent temporary threshold shift to permanent threshold shift [1]. According to the World Health Organization (WHO) recorded the number of hearing loss in 2000 there are 250 million (4.2%) of the world population who suffer from hearing loss and approximately half (75-140 million) are in Southeast Asia. From the results of the WHO MultiClinic Study in 1998, Indonesia included four countries in Southeast Asia with a high prevalence of hearing loss (4.6%), the other three countries were Sri Lanka (8.8%), Myanmar (8.4%), and India (6.3%) [2].

Indonesia data based on Health Survey of Hearing and Vision Sensory in 1994-1996 also showed high morbidity, ear diseases (18.5%), prevalence of hearing loss (16.8%), while deafness was found at (0.4%) population [3]. From the data obtained from the Public Health Service of Jambi City in 2016

also recorded the result of hearing impairment occurring in more than half the number of Community Health Clinic located within the area of Jambi City. With the highest number of hearing loss patients, Simpang IV Sipin Public Health Clinic (10 patients), Simpang Kawat Public Health Clinic (13 patients), Kebun Handil Community Health Clinic (73 patients), Pakuan Baru Public Health Clinic (85 patients), and the most are occupied by Community Health Clinic of Olak Kemang (261 patients) which have significant numbers among other Community Health Clinic. Where the working area of Community Health Clinic Olak Kemang is the domicile of all boat ketek riders who work on the port of boat ketek in Ancol Tanggo Rajo Jambi.

Noise is a disturbing or unwelcome noise or sound. From this definition indicates that the actual noise is very subjective, depending on each individual, time and place of the occurrence of noise. While in audiology, noise is a mixture of pure tone sounds with various frequencies [4].

Noise generated by the engine of boat ketek has exceeded the threshold tolerated by the hearing in accordance with the Decree of the Minister of Manpower Number: KEP-51/men/1999, on the Threshold Level of noise in the workplace, set at 85 dB with the longest duration of exposure for 8 hours. But the fact is in the engine of boat ketek located in the port of Ancol Tanggo Rajo Jambi City, the average noise of the machine is 110 dB with average exposure time for more than 60 minutes per day. That should only be exposed for only about 90 seconds [5] [6].

2. Research purposes

The purpose of this study was to look at the picture of hearing health with exposure to continuous noise for long periods of time.

3. Methods and sampling

This research was conducted on boat ketek riders in Ancol Tanggo Rajo Jambi. This research is descriptive research with cross sectional study using sampling technique of sampling by random sampling. This research was carried out at port boat of Ancol Tanggo Rajo Jambi on October 29, 2017. The sample was taken from the population of the boat ketek riders in the port of boat Ancol Tanggo Rajo Jambi City as many as 30 people. The variables studied were exposure of noise intensity, length of service, hearing loss and degree of hearing loss. How to collect data are through direct interviews, otoscopy checks and audiometric tests. The procedure of measuring noise at work with a sound level meter device held by a distance of 1.5 meters from a noisy source, is performed 5 times at each noise source [7].

4. Result and discussion

The result of this research shows the characteristic of the boat ketek rider Ancol Tanggo Rajo Jambi, found that all of the responden in the age more than 30. Most ketek boat riders are in the age category > 35 years of 29 subjects (96.7%) while the least are in the 18-34 year age category amounting to 1 person (3.3%).

The audiometric picture obtained, shows all subjects experiencing hearing loss, with the spread of each type of hearing loss, a conductive hearing loss of 9 people (30%), sensorineural hearing loss of 3 people (10%), mixed hearing loss 3 people (10%), and the most common type of hearing loss is Noise Induce Hearing Loss of 15 people (50%). An illustration of the frequency distribution of the subject based on the type of hearing loss described in table 1 below.

Table 1. Frequency distribution of the subject based on the type of hearing loss.

Hearing Status	Frequency (n)	Percentage (%)
Normal	0	0
Conductive	9	30
Hearing Loss Sensorineural	3	10
Noise Induce Hearing Loss	15	50
Mix Hearing Loss	3	10
Total	30	100.0

From the condition of hearing as can be seen in table 1, there is also a difference in the degree of hearing loss in either the left ear or right ear, with the spread of the degree of hearing loss each, the normal left ear 5 people (16.7%), the normal right ear 0 people (0%), left ear mild hearing loss 16 people (53.3%), right ear mild hearing loss 18 people (60%), ear hearing loss moderate 7 people (23.3%), right ear hearing loss moderate 10 people (33.3%), left ear hearing loss was moderate to heavy 2 people (6.7%), right ear hearing loss was moderate to heavy 2 people (6.7%). as can be seen in tables 2 and 3 below.

Table 2. Frequency distribution of the subject based on the degree of hearing (left-ear).

Degree of Hearing Loss	Frequency (n)	Percentage (%)
Normal	5	16.7
Mild	16	53.3
Moderate	7	23.3
Moderate to Heavy	2	6.7
Total	30	100.0

Table 3. Frequency distribution of the subject based on the degree of hearing (right-ear).

Degree of Hearing Loss	Frequency (n)	Percentage (%)
Mild	18	60
Moderate	10	33.3
Moderate to Heavy	2	6.7
Total	30	100.0

The noise intensity obtained in the respondent workspace ranges from 110-112 dB by using sound level meter equipment, depending on the speed of boat ketek.

The intensity of noisy exposure can cause hearing loss of conductive or sensorineural hearing loss. Exposure to noisy intensity over long periods and exceeding tolerable thresholds may cause damage to the corti organs which will result in sensorineural hearing loss [8]. Conductive hearing loss occurs when there is damage to the outer ear or middle ear so that sound waves cannot be transmitted to vibrate the fluid in the ear in [9]. Conductive hearing loss may be caused by interference with the outer ear or middle ear. Disorders of the external ear which may cause conductive hearing loss such as ear canal atresia, blockage by the serumen, external otitis sirkumskripta, osteoma of the ear canal. Meanwhile interference with the middle ear that can cause conductive hearing loss are blockage of

tuba eustachius, otitis media, otosklerosis, timpanosklerosis, hemotimpanum, and dislocation of hearing bone [10].

Sensorineural hearing loss is divided in sensorineural hearing loss of cochlea and retrochlea. Sensorineural cochlear hearing loss is caused by aplasia (congenital), labyrinthitis (bacteria or virus) and drug intoxication (streptomycin, kanamycin, garamycin, neomycin, quinine, acetosal, or alcohol). In addition, it can also be caused by sudden deafness, capitis trauma, acoustic trauma and noisy exposure. Sensorineural cetrocochlear hearing loss is caused by acoustic neuroma, cerebellar pons corner tumor, multiple myeloma, brain injury, cerebral hemorrhage, and other brain abnormalities [11].

In research conducted by Mutiarani Z proves that the working period is a risk factor of hearing loss in workers [12].

The degree of hearing loss in the right ear has a higher degree compared to the left ear. The riding position of the ketek boat is one of the factors, since the distance between the ears from the sound source should also be considered [13]. Where the ketek boat engine is placed behind the ketek boat in the right side, beside the riders of the ketek boat. And this position applies to every boat ketek that exist in the area of Ancol, Tanggorajo, Jambi City.

5. Conclusion

The boat riders who suffer from hearing loss due to noise at the port of Ancol Tanggo Rajo Jambi as many as 30 respondents (100%). Of the 30 respondents who experienced hearing loss, 9 respondents had conductive hearing loss, 3 respondents had sensorineural hearing loss, 15 respondents had hearing loss due to noise, and 3 respondents had mixed hearing loss.

The degree of right ear hearing loss is greater than the left ear, due to ear distance with a sound source closer to the right ear. The working time of the boat riders makes the likelihood of hearing loss greater (> 10 years). Environmental noise that occurs in ketek boat engine ranges between 110-112 dB, depending on the speed of the boat ketek. And is the intensity of noise that is above the normal tolerated ear threshold.

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