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Audiometric Findings of Textile Workers in Mali

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ABSTRACT

Industrial noise is a factor of lesion of the auditory apparatus, which typically results in installing sensorineural deafness to varying degrees. Implantation of industrial enterprises in our developing countries is at the front the hearing problem related to exposure to noise.

Objective:

To determine the frequency of hearing loss among textile industry workers of weaving department.

Materials and Methods:

Sixty-eight (68) male workers from the weaving section of a textile factory in Bamako (Mali)"ITEMA" were selected as subjects of the study. To evaluate the hearing ability of the subjects, pure-tone audiometric tests were done.

Results:

The mean age of the subjects is 32 years with a range of 30 to 55 years. The exposure time in the weaving section varied from 6 months to 20 years. In the weaving section, the mean noise level was 101.2 +/- 2.6 dBA.

Hypoacousia and Tinnitus were the most common subjective symptoms in the surveyed mill.

The results of the audiometric examinations showed that the hearing threshold levels were higher at frequencies 1,000 and 4,000 Hz for subjects with the longest duration of employment, 85% of the subjects examined suffer from varying degrees of hearing impairment.

Conclusion:

The industrialization of our states is a problem hearing in some workers. It is therefore important to put more emphasis on noise protection by the ear protection device, the only way to prevent neurosensory disorders related to industrial noise.

Keywords: Noise, Hearing loss, Textile factory, Mali

Introduction:

Industrial noise is a factor of lesion of the auditory apparatus, which typically results in installing sensorineural deafness to varying degrees.

Many developing countries are aiming at industrialization and there is greater and greater concern for occupational safety and health issues[1].

In the aftermath of independence, the republic of Mali has experienced the startup of its industry with the help of the socialist countries including notably the textile industry.

Noise is one of the major health threats to textile workers. It leads some systemic symptoms in exposed workers as well as hearing loss[1]. Noise and hearing loss problems in developing countries have been rather well documented in many countries[1-8]. Those studies have revealed worker exposure to serious levels of noise[1].

Noise induced hearing loss (NIHL) is one of the most prevalent occupational diseases and industrialization made it very common[9]. NIHL is important from the clinical, social and economic point[9].

Implantation of industrial enterprises in our developing countries is at the front the hearing problem related to exposure to noise.

Objective:

To determine the frequency of hearing loss among textile industry workers of weaving department.

Materials and Methods:

Sixty-eight (68) male workers from the weaving section of a textile factory in Bamako (Mali)"ITEMA" were selected as subjects of the study. Workers have been selected by age and year of exposure to noise in order to have a representative sample on a staff of 136 workers in the workshop. All subjects work in one of the three 8-hr work shifts implemented in the factory. All subjects have no history of ear protective equipment use.

Noise levels were measured using an integrating sound level meter (Realistic).

To evaluate the hearing ability of the subjects, pure-tone audiometric tests were done using Audiometer AD27(Denmark) at 6 frequencies, i.e., 250, 500, 1,000, 2,000, 4,000 and 8,000 Hz. Test at each frequency was performed separately for each ear. The average hearing losses calculated from the formula dB (1000 Hz + 2000 Hz + 4000 Hz):3.

The subjects were examined after cessation of noise exposure for more than 6hr. The examinations were conducted in a quiet room with a background noise level less than 40dBA. To rule out the presence of hearing loss from other causes, an otologic examination was done on all subjects. Subjects with histories of ear disorders were excluded from this study.

Results:

- The mean age of the subjects is 32 years with a range of 30 to 55 years.
- The exposure time in the weaving section varied from 6 months to 20 years.
- Protection is not used by the workers
- In the weaving section, the mean noise level was 101.2 ± 2.6 dBA.
- As shown in Table 1, Hypoacousia and Tinnitus were the most common subjective symptoms in the surveyed mill.
- The distribution of patients by age and duration of exposure to noise is focused on Table 2.
- The results of the audiometric examinations showed that the hearing threshold levels were higher at frequencies 1,000 and 4,000 Hz for subjects with the longest duration of employment, 85% of the subjects examined suffer from varying degrees of hearing impairment.

The deterioration in hearing became prominent after 10 years of employment in the weaving section.

Duration of exposure to noise (years)	Subjective symptoms			
	Hypoacousia		Tinnitus	
	Number	%	Number	%
0-10	2	5	6	17,64
11-20	24	60	17	50
> 20	14	35	11	32,35
Total	40	100	34	100
Total (n=68)	40/68	58, 82%	34/68	50%

Table 1: Subjective symptoms of weavers according to length of employment

Discussion:

Our study mean 3 influence of industrial noise particularly that of the textile industry on the hearing aid in our country, she highlighted the lack of disease prevention framework relating to the profession. Factors aggravating this condition should receive particular attention as outdated machinery, lack of ear protection devices.

The effect of noise on the hearing as occupational disease was raised again in 1700 by Italian Bernadino Ramizzini[10].

Noise both disturbs the environment and, when

Duration of exposure to noise(years)	AGE (years)					
	≤40		41-49		>50	
	Number	%	Number	%	Number	%
0-10 ans	11	16,17	0	0	1	1,47
11-20	14	20,58	17	25	1	1,47
>20	0	0	15	22,05	9	13,23
Total	25	36,76	32	47,05	11	16,70

Table 2: Distribution of patients by age and duration of exposure to noise

excessive, damages the hearing mechanism Its harmful effects on human hearing have been known for many years[2], and permanent noise-induced deafness as the result of various occupations, both civilian and military, ancient and modern, has increasingly been recognized[2].

Harmful effects of loud noise on human health are known for many years. With industrialization, more people are exposed to noise[3]. Some problems including hearing loss occur in the industrial workers who are exposed to noise[3]. Generally, the weaving rooms of textile factories are the most noisy places in a factory, and the individuals working in these places are exposed to 95 dB and higher noise levels[3].

The industrial boom has prompted researchers to work more on sensorineural deafness caused by noise in textile factories[1,2,4,7-11].

The loud noise cause ultrastructural changes of degeneration and atrophy of the organ of Corti[6,8,12,13].

The study clearly showed the deleterious effects of uncontrolled occupational noise exposure on unprotected workers.

a) Sex, Age and duration of exposure to noise

Unlike some work[4,5,6,11], our exposed workers were all male. As is the case in many works[6,7,9,14], the study noted that males generally seems more suitable for this type of physical work.

The mean age of the subjects is 32 years in our study, it was striking that young workers in

their 20's to 30's had already developed noise-induced hearing losses[1].

b) Duration of noise exposure and hearing loss

Such occupational noise trauma results in a sensorineural loss of hearing of varying degree, depending upon the noise level and the duration of exposure to the noise[2]. Minor exposures cause temporary loss of hearing (temporary hearing threshold shift) with recovery, some individuals proving more susceptible than others to this type of hearing loss[2]. Excessive noise, continued for long periods, will reduce permanently (permanent hearing threshold shift) the hearing of even the most resistant individual unless the ears are adequately protected[2]. This is to say, a combination of noise intensity and duration, i.e., the noise exposure, will at a certain level permanently damage human hearing[2].

The hypothesis thus reported by several authors to learn more exposure time is very marked more hearing problems are accentuated for exposure periods of between 5 and 15 years[2,6,7,9,10,12,13], seems confirmed in our study.

Hearing damage to our workers reflect the characteristics for an occupational deafness[1,2,6,7,9,10,15,16].

Studies have shown that hearing loss following a dystrophic process of neurosensory cells of the organ of Corti to acoustic trauma are less marked for exposure times of over fifteen years[1,2,4,6,8,9,12], a trend found in our work.

c) Prevention of occupational deafness

Our study shows the lack of healthy education on the prevention of occupational deafness policy, workers don't wear personal ear protection device because they find it bulky which explains the significant rate of hearing loss caused by the noise of the machines of the textile factory.

Therefore, necessarily that public policies should consider effective measures for the prevention of deafness related to acoustic trauma in the factories, whose productions promote adverse effects on cochlea.

Conclusion:

The industrialization of our states is a problem hearing in some workers. The subjects exposed to noise for a long time remain the main victims. It is therefore important to put more emphasis on noise protection by the ear protection device, the only way to prevent neurosensory disorders related to industrial noise.

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