

NOISE IS NOT SOUND

Lucia KUZMOVÁ, Tatiana KIMÁKOVÁ, Petr KACHLÍK

Abstract: *The noise pollution is in meantime very important theme. The noise is very important factor, because of its raising threshold. The impact on human's health by noise is a hidden long-time process. We get into contact with sound and noise every day at home, at work and also in nature. The noise factor is important in comparison with other health factors because it is acting in every time, also in time we sleep and spend for relax. The noise pollution is raising and as its consequence the human's health is getting damaged, but not only on hearing mechanism. Many studies, publications, experiments, measurements and research has been performed on noise pollution, however the citizens are not very well informed about the noise impact on their health. We tolerate higher noise thresholds very often, but we are not very conscious about the consequences. That is why we need to explore the noise impact on human's health and find solution how to protect one of our most important apparatus – the hearing mechanism. This lecture is about the dangerous impact of noise and consequences on human's health.*

Key words: *noise, health, consequence, action*

Introduction

From physiological aspects the sound is defined as a mechanical wave in frequency range which hears human ear (16 - 20 000 Hz) (Havranek, 1990). The noise is every unwanted sound, which has disturbing, unpleasant or in the worst case strong negative effect on human's health. The noise is nowadays commonly confirmed as one factors of stress in many cases. We need to say that stress is risk factor by 90 % of diseases. On the other side people are getting more information about the noise and its harmful impact on their health. However, we are still not enough aware of the negative effects of the noise (Aghova, 1993).

Negative effect of noise damages health on workplace, but in recent years is taken into account the effect of noise in the environment. Therefore it is important to clarify the effects of so-called "Ignorant" noise.

Noise in work environment

The noise originates in the nature by physical processes (water flow, windstorm), by animals as their expression of being alive or by human activity (transportation, industry, household, hobbies) (Správy o stave životného prostredia SR, 2010).

The noise is most common negative factor in the work environment, while only in Slovakia in 2008 were more than 88 300 employees of various economic sectors exposed to excessive noise. Despite the generally accepted view, that threaten are only (or especially) employees of industries, there is number of other professions that may be exposed to noise levels exceeding the limits. Exposure to noise also exists by professional musicians, employees of music clubs and bars, high noise levels were measured also in schools, high level of noise exposure exists also by employees of call centers, etc. Ever-increasing noise level in the environment, an increasing number of activities associated with production of more or less noise and an increasingly smaller number of opportunities to relax in the quiet place increased demands on the organ of hearing and reduce the possibility of its regeneration. The level of hearing is getting worse with each generation, according to British studies, the threshold of hearing skewed in the last century of about 5 dB (Janousek, 2009).

Noise impact on the human

We separate the noise activity into acute, chronic and psycho-social. The result of acute noise activity is acute acoustic trauma. It is a short time immediate activity of extreme high noise level (explosion) (Ághová, 1993). Normally, a few hours or days after exposure to excessive noise hearing can return to the normal. If repeated exposure and hearing does not have enough time to recover, a temporary change in hearing may become permanent and hearing damage is irreversible (Janousek 2010).

The chronic noise activity can have negative influence on hearing threshold. Chronic overloading (intensity of 80-90dB like loud music, sea surf, underground transportation, windstorm) of hairlike reception cells in ear exhausts metabolic resources and destructive processes originate in cells. If the noise activity stops after a period of time, the cell regenerates (the hearing threshold drifts temporarily). The psycho-social activity of noise evokes human's nuisance. The nuisance is what makes noise from sound. Many experts confirm that nuisance is the most important impact of noise. The nuisance is often expressed as disturbance, anger, comfort limitation and stress. The nuisance is also a primary emotional reaction, which can originate by direct perception of noise. It can also originate as a side effect of noise interferential with current human activity or as something which evokes unpleasant physical feeling. We need to say that we can have influence on noise origination. This can be done either by direct approach (turn off noisy mixer, ask neighbor to cut the grass some other time, make a complain on hygienic station) or indirect approach (we need to know the time of the noise occurrence). It is also important to convince the respondent that he can or cannot influence the noise occurrence. Sensitive individuals prove to have besides nuisance also symptoms of anger, tension, nerves, depression, second-class feeling. They react to noise by raised excitation, alarm reaction, stronger vasoconstriction, faster speed. They also complain about health problems, depression, higher stress reaction. Women have significantly higher perceptiveness of noise (Informačný balík – Hluk pri práci, 2010).

Based on epidemiological studies scientists found out among the inhabitants in the Czech Republic the overall increase of morbidity as a result of chronic stress exposure. Disorders were recorded in blood pressure, heart disease, gastrointestinal disorders, and lower resistance to infections. It was concluded that the disease occurred after long time spent in noisy environments, in vascular diseases after 5-10 years and in nerve diseases after 8-10 years of noise exposure (Zdravotní účinky hluku, 2010).

THE BIOLOGICAL IMPACTS OF NOISE ARE:

- malfunction of vegetative nervous system
- malfunction of cardio vascular system
- headache
- dizziness, faint, vomiting
- dumping of digestive system activity
- raised activity of hypophysis, adrenal glands, thyroid
- problems with vision,
- sleep disturbances,
- psycho-social disorders (Martonova, 1998).

In the population there are people who require increased protection against noise. People who have had ear disease or who have disorders of the endocrine functions have high risk of getting cardiovascular diseases (high blood pressure, increased heart rate etc.). Exposure to noise in the environment is not time-limited, interference occurs also at the time, which is designed for rest and recovery (Kuzmova, 2010).

ARRANGEMENTS LEADING TO REDUCTION OF NOISE IN THE ENVIRONMENT:

- lower the volume on radio, television, music player
- announce other neighbors noisy work on time
- turn off cell phone on public occasions
- respect the speed limit when driving a car
- relax in nature (Úrad verejného zdravotníctva SR, 2010).

Conclusion

The problem of noise pollution is discussed for a couple of years. We meet sound and noise every day at home or at work, school, even in nature. The human is exposed to noise besides other negative factors of environment. The noise is the most serious factor, because it impacts human even at time human needs for relax, regeneration and sleep. The noise in environment is raising and that harms not only human's hearing but also human's health.

Completely remove noise from the environment is not possible. Understanding these issues is the first step to protect our health. While keeping the above mentioned arrangements, we can also help ourselves to make our life more comfortable.

Literature

- ÁGHOVÁ, E. et al. *Hygiena, učebnica pre lekárske fakulty*. Martin: Osveta, 1993, s. 12. ISBN 80-217-0515-9.
- HAVRÁNEK, J. et al. *Hluk a zdraví*. Praha: Avicenum, 1990, s. 19. ISBN 80-201-0020-2.
- Informačný balík – Hluk pri práci. [online]. [Cit. 2010-02-01]. Dostupné<http://ew2005.osha.europa.eu/pressroom/infopack/infopack_sk.doc>
- JANOUSĚK, M. Chráníme si sluch před hlukom. *Bedeker zdravia*, vol. 3, 2010, no 6, page 113. ISSN 1337-2734.
- JANOUSĚK, M. Nepriateľ hluk. *Bedeker zdravia*, vol. 1, 2009, no 5, page 124. ISSN 1337-2734.
- KUZMOVÁ, L. Problematika hluku v meste Košice: diplomová práca. Košice: Univerzita Pavla Jozefa Šafárika. Lekárska fakulta, 2010, s. 28.
- MARTONOVÁ, M. Elektrotechnika a problémy životného prostredia. Košice: Academic press, 1998. s. 104. ISBN 80-88786-86-X.
- Správy o stave životného prostredia Slovenskej republiky [online]. [Cit. 2010-02-07]. Dostupné <<http://www.sazp.sk/slovak/periodika/sprava/sprava97/Tono/riziko/hluk.html>>
- Úrad verejného zdravotníctva SR [online]. [Cit.2010-02-17]. Dostupné<http://www.uvzsr.sk/index.php?option=com_content&view=article&id=355:vyzvanarodneho-referenneho-centra-pre-hluk-a-vibracie-na-veobecne-repektovanie-prava-na-ticho-v-nadvaeznosti-na-mezinarodni-aktivita-international-noise-awareness-day&catid=62:ivotne-prostredie&Itemid=69>
- Zdravotní účinky hluku. [online]. [Cit.2010-12-07]. Dostupné na internete: <http://www.szu.cz/tema/zivotni-prostredi/zakladni-informace-o-monitorovani-hluku>.

HLUK NIE JE ZVUK

Abstrakt: Problematika hluku je celosvetovo rozšírená. Hluk je závažnejší faktor aj preto, že jeho hladiny sa stále zvyšujú a poškodenie zdravia ľudí prebieha dlhodobo a skryto. So zvukom a napokon aj samotným hlukom sa človek stretáva denne či už doma, v škole, na pracovisku a tiež aj v prírode. Oproti iným faktorom je tento faktor o to závažnejší, že pôsobí neustále, a to aj v čase určenom na oddych a relaxáciu a tiež v noci, v čase určenom na spánok. Hluk v životnom prostredí sa neustále zvyšuje, čo má za následok poškodenie zdravia ľudí, a to nie len na sluchovom aparáte. Aj keď sa tomuto závažnému negatívnemu faktoru venujú rôzne štúdie, publikácie, výskumy a vykonávajú sa mnohé merania, samotný občan je málo informovaný o negatívnom vplyve hluku na organizmus. Často toleruje aj vyššie hladiny hluku, neuvedomujúc si závažnosť danej situácie. Preto je nevyhnutne skúmať vplyv hluku na zdravie človeka a tiež hľadať riešenia, ako si chrániť a nezničiť jeden z dôležitých zmyslových orgánov – sluch. V tejto prednáške sme sa zamerali na škodlivé účinky a zdravotné dôsledky hluku na organizmus človeka.

Kľúčové slová: hluk, zdravie, opatrenia, dôsledky.