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THE INFLUENCE OF NOISE EXPOSURE ON THE HEARING ANALYZER

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More than 700 million people worldwide suffer from some degree of hearing loss.Exposure to harmful noise can occur at any age. People of all ages, including children, adolescents, young people and the elderly, can develop Noise-induced hearing loss (NIHL). NIHL is hearing impairment resulting from exposure to loud sound. NIHL occurs when too much sound intensity is transmitted into and through the auditory system. The ear can be exposed to short periods of sound in excess of 120 dB without permanent harm, albeit with discomfort and possibly pain; but long term exposure to sound levels over 85 dB (A) can cause permanent hearing loss. Such psychosocial states, regardless of age, can lead to social isolation, which is known to negatively impact one's overall health and well-being.The compounding impacts can also lead to depression,especially if hearing impairment leads to tinnitus.Research suggests that those with hearing impairment or loss may be at a greater risk for deterioration of quality of life,as captured by a quote from Helen Keller: "Blindness cuts us off from things, but deafness cuts us off from people". Hearing impairment and loss of hearing, regardless of source or age, also limits experiencing the many benefits of sound on quality of life. In addition to the interpersonal social benefits, new studies suggest the effects of nature sounds, such as birds chirping and water, can positively affect an individual's capacity to recover after being stressed or to increase cognitive focus.

We investigate the effect of noise exposure on a sound analyzer of an otologically healthy person.Then we try to define the original air and bone conductivity with the help of sets of chambers; to evaluate changes in the air and bone conduction after noise exposure with a volume of 110 dB on the hearing organ within 30 minutes; to determine whether there are gender differences in sound production and perception and if there isany prevalence of right-/left-handed damage; to determine whether the initial sound and sound performance values are restored to the initial values (hypothesis) 2 hours after the noise exposure.

The subject of the study was a group of 20 people at the age between 15 and 40 (10 men and 10 women).We didn't include in our experiment a group of people under the age 15 and over 40 due to the immaturity of the auditory analyzer and the age-relateddeteriorationof the sound perception. A bone and air conduction study was performed by using a set of chambers before, immediately after 30 minute effect and 2 hours later. Noise exposure was provided on headphones by loud music with a volume of 110 dB. We used a set of instruments consisting of 4 paratons (C128, C512, C1024, C2048).

In all cases there was a decrease in bone and air conductivity on all chambers of the C128, C512, C1024, C2048 after 30 minute exposure to noise with volume of 110 dB. The air conductivity decreased more than bone. The increasein air and bone conduction is more pronounced in men. Left-hand reduction of bone and air conductivity is expressed more than right-hand. After 2 hours the air and bone conductivity was practically restored to the initial values, except the fork C512. Preferential changes of air conductivity of chambers with oscillationfrequency C512 , C1024, C2048 indicate violation of sound perception.

Consequently the sound analyzer can be disrupted by the impact of loud sounds deliveringon headphones in the form of TTS (Temporary Threshold Shift) auditory fatigue.And 2 hours is not enough for complete hearing recovery.