Scientists research effects of infrasonic vibrations in humans

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It is known that the human body can generate mechanical vibrations at very low frequencies, so-called infrasonic waves. Such low-frequency vibrations are produced by physiological processes—heartbeats, respiratory movements, blood flow in vessels, and other processes. Different organs of the human body produce different resonance frequencies. The heart resonance frequency is ~ 1 hz. The brain has a resonance frequency of ~ 10 hz, blood circulation about 0.05 to 0.3 hz.

Scientists from the National Research Nuclear University and collaborators have used a highly sensitive laser device to register infrasonic vibrations in human body. "We tried to find out factors, influencing amplitude-frequency characteristics of such vibrations," says researcher Olga Molchanova.

The scientists discovered that the observed vibrations are connected with the cardiovascular system, which has its own proper movements occurring simultaneously with the work of the heart. Three types of infrasonic vibrations were registered. Waves of the first type are connected with the heartbeat; the second with the human respiratory rhythm; the third, called Traube-Hering waves, with states of emotional tension. Thus, it could be possible to judge the human emotional state via the amplitude frequency response of these waves.

Stemming the blood flow along vessels using a tourniquet applied to the wrist changes the intensity of laser radiation through tissues, which is connected with the stoppage of blood inflow into vessels. This effect is

observed due to the lowering of tissue enrichment by oxygen, which absorbs radiation in the nearest infrared region. An opposite effect was observed when subjects held their breath—the intensity of the laser radiation through tissues lowered. It might be connected with the fact that while holding the breath, blood is saturated with hemoglobin, which leads to the increase of laser radiation absorption and the decrease of the signal. These results could be important for non-invasive medical diagnostics.

Provided by National Research Nuclear University

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