

About a new method of correcting the blood coagulation system of a person with
using musical and acoustic influences

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The invented method of musical-acoustic correction of the blood coagulation system is a non-drug method of exposure, the main task of which is a directed change in the patient's state of the blood coagulation system with the help of music and acoustic signals.

A research program was carried out to scientifically substantiate the new method. The experiments consisted of two series and were carried out at the Clinical Center of the Russian Scientific Center for Computer Science and the K of the Federal Service for Healthcare of the Russian Federation. For acoustic influences, 3 programs were developed, recorded on laser compact discs: No. 1 - "Bells"; # 2 - simple upward modulated tones up to 22 kHz; №3 - musical and therapeutic program "Hypertension" series "Music of Health".

1st series of experiments had the main task to study the influence of direct acoustic effects on the state of blood coagulation in vitro and consisted of 3 experiments.

For the research, the blood of 60 patients from different departments of the Center was used, 20 for each exposure program. Broadcast of musical and acoustic programs was carried out with the help of the Panasonic music center. The sound source was located at a distance of 30 cm from the tripod with test tubes in which the blood under study was located. The exposure to a volume of 45 dB was carried out for an hour in each series of experiments. After that, the prothrombin index was measured in the "sonicated" blood (Quick AJ et al., 1935), which was expressed as a percentage of the coagulation time of normal plasma to the coagulation time of the patient's plasma. The double control in the experiments was the blood of the same patients, not exposed to acoustic influences, in which the prothrombin index (PI) was determined in a similar way.

2nd series of experiments consisted in the study of the dynamics of the prothrombin index in 20 patients suffering from hypertension of the 2nd degree, who received, along with standard drug therapy, sessions of receptive music therapy, lasting 45 minutes, No. 7 every other day. PI was determined before musical influences and after the course music therapy. Group of control of hypertensive disease of the 2nd degree, who received only therapy. 17 patients with medicinal

As a result of the studies carried out, it was established:

1. Direct acoustic effects on the blood of patients in the 1st series experiments caused changes in the coagulation system:
 - the program "Bells" influenced the prothrombin index upward by an average of $6.95 \pm 0.55\%$ ($P = 0.01$);
 - when using simple ascending modulated tones up to 22 KHz, no statistically significant changes in the level of the prothrombin index were found;
 - the program "Hypertension" caused a statistically significant decrease
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prothrombin index by an average of $6.29 \pm 1.06\%$ ($P = 0.01$).

2. Musical influences directly on patients in experiments series No. 2 had a statistically significant effect on PI, towards its decrease by an average of $4.7 \pm 1.01\%$ ($P = 0.01$). The data presented is convincing showed what some musical and acoustic influences can affect the blood coagulation system and change the PI indicators upward in some cases, downward in others.

In discussing the possible mechanisms of the direct influence of acoustic signals on the blood coagulation system, we can rely on our earlier studies, which proved the multidirectional effect of the effects of sounds of the audible range on the activity of cell cultures, as well as on the state of electrochemical activity of water, due to the influence of longitudinal electromagnetic fields arising in the aquatic environment due to the transformation of acoustic energy into electromagnetic (S.V. Shushardzhan, 1998-2005).

With direct exposure to the blood, certain acoustic frequencies, transformed in electromagnetic, may activate how platelet, so and plasma hemostasis, affecting the physicochemical plasma and phosphate properties elements. Other specific frequencies through a similar mechanism works in the opposite direction.

When exposed to music directly on patients, the neuroendocrine component of emotional experiences appearing as a reaction to the acoustic material presented during listening appears to be added to the direct resonance effect. Moreover, depending on the nature of the experience, the vascular tone and rheological properties of the blood can also change in different directions. It is known that vasospasm promotes the process of blood coagulation. The program "Hypertension" has a pronounced hypotensive and antispasmodic properties, which has been proven experimentally and clinically. This makes to some extent understandable the decrease in the prothrombin index in hypertensive patients who took a course of music therapy.

There is no doubt about the relevance of further developments in this direction and the prospects for therapeutic and prophylactic use of musical and acoustic correction of the blood coagulation system in thrombophlebitis, varicose veins, trophic ulcers, wound bleeding, risks of thrombus formation, bleeding or hemorrhage.

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