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RESISTIVE FACTORS OF THE BLOOD FLOW AND ENERGY DISTRIBUTION IN THE BODY

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Purpose of the Study: Is to identify the reason for the formation of the resistive factors in blood flow: Inertial flow and turbulence in large arteries and increasing viscosity in the venous blood.

Methods and Materials: Blood flow velocities were studied in the different sites of the large vessels in 35 normal adults (15 men 20 women, age 21 - 49 years) with the use of Magnetic Resonance Angiography. Blood radiodensity (HU) was measured by the CT scanner. Blood flow pulsatility, resistivity indexes were carried out with the Duplex US.

Results: Resistive and pulsatility indexes for the ascending aorta are 0.96 ± 0.07 and 3.14 ± 1.7 , abdominal aorta 0.91 ± 0.07 and 2.7 ± 1.3 , carotid artery 0.74 ± 0.07 and 2.04 ± 0.53 , pulmonary trunk 0.74 ± 0.11 and 1.49 ± 0.37 , inferior vena cava 0.32 ± 0.21 and 0.69 ± 0.37 . Blood radiodensity (in HU) in the ascending aorta is 57.3 ± 3.5 , distal thoracic aorta 25.7 ± 3.1 , inferior vena cava 59.3 ± 3.3 . Pulsation of the peak velocity is expressed at the external wall of the isthmus of aorta at the end of systole.

Conclusion: Heart energy is stored in the elastic deformation of the blood cells and arterial walls, in kinetic energy of the blood flow entropy of the system. Inertial blood flow due to the frequency dispersion in the arteries, transforms to the flow with the high fluidity in capillaries. Gibbs free energy increases, enabling spontaneous chemical reaction to proceed across the cell membrane. Process is altered in the venous blood. Changes in resistance express transformation of the energy in the substance.

Biography

Guram Beraia is a third year student of Tbilisi State Medical University on MD faculty. He is doing a research in oscillatory hemodynamics. New approach has a different way of focusing about altering blood flow and explains the reason of resistive factors in arterial circulation, indicates the reason for separation of venous and lymphatic circulations. For the advanced views he is awarded with the gold medal in I-SWEEEP 2012, Houston, USA. Diploma for attendance in EU contest for young inventors Prague, Czech Republic 2013 and European congress of Radiology 2015. He took part in health care summit London, 2016. His works are openly published in different journals.

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