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BIOELECTROMAGNETIC WEARABLE TO REGULATE BLOOD, CELLS, AND FLUIDS

Abstract

Blood flow rate of RBCs, blood viscosity, and shear rate are outlined from (Jo, et al, 2018) to investigate the effects of PEMF on the changes of blood flow. Moreover,the s patio-temporal evolution of magnetohydrodynamic blood flow and heat dynamics through a porous medium in a wavy-walled artery are outlined from (Majee, et al, 2021) . PEMF effects flowmediated dilatation (FMD) or change in artery diameter in upper arm blood vessel. PEMF therapy for 3X per day for 12 weeks resulted in reduction of SBP, DBP, and MAP, and improved BP and vascular function in hypertensive individuals.The Effects of Pulsed Magnetic Field (PEMF) on velocity of blood flow of RBCs, blood viscosity, and shear rate in microvascular mode are examined. With 1Hz was pulsed to image rouleaux formation of RBCs and erythrocyte sedimentation rate (ESR), 4um/sec increase in RBC velocity, and increased RBC aggregation, blood velocity, and reduced viscosity (Jo ,et al, 2018) As too much iron or problems with utilising, storing, or transporting iron is the leading cause of vision loss for people over 50, PEMF also provides v to move more ferrous minerals such as Fe 3 O 4 in red blood cells. A ¡1-2kg electromagnetic wearable is designed, built and tested as a countermeasure to electromagnetically stimulate polarised ions. A prototype is developed and embedded with coil wires wrapped with pure copper conductive tape connected to an electronics box. Inner Memory Foam-like fabric sewn on exterior and provides 3D printed pocket spacing to embed EM coils. A pilot study is currently being discussed involving humans who have biologically challenges. Blood flow will be measured with tests and data analysis with methods. Current literature discusses ocular anatomy, effects of PEMF on blood on a cellular level(e.g. red blood cells), principles of magnetohydrodynamics, and the prototype design. Experiments and models test effects of pulsing 10-40 Hz on relieving coagulation, blood clots, and stimulating fluid flow. If PEMF yields similar efficacy to humans in uG, PEMF could move ferrous ions and fluid to pressure, treating conditions countermeasure for fluid shift for space missions beyond Earth.