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(Research Article)
Acoustic cavitation, a non-invasive method for thrombus destruction

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Abstract

In this study, ultrasound waves were used to destroy blood clots or thrombus by using ultrasound waves and creating acoustic cavitation, which is one of the non-thermal biological effects of these waves. Due to the fact that thrombosis leads to the blockage of blood vessels and is one of the most important causes of stroke and heart attack, in-vitro tests were performed on the blood clot tissue. Irradiation of ultrasound waves with different frequencies and intensities in variable time intervals, in the form of timed pulses, and uniform radiation, caused the cavitation phenomenon and the creation of gas microbubbles in the environment. After sonic pressure was applied to the bubbles and collapse occurred, the irradiated area was destroyed and the clot tissue slipped. Ultrasonic images and comparison of the irradiated samples with the reference model and the difference in the molecular structure of the tissue and clot walls with a microscope were used to confirm the results. Therefore, the results of this research confirmed that the proposed method can be used clinically as an alternative to non-invasive treatment to eliminate thrombosis.

Keywords: Ultrasound waves, Thrombosis, Acoustic cavitation, Thrombolysis, Non-invasive treatment.

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