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(Research Article)
Determination of optimal parameters of ultrasonic waves on permatogenesis process of neonate mouse testis

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Abstract

Ultrasonic waves are rapidly emerging as an innovative regeneration technique, improving cell performance in tissue engineering. In this study, the optimal parameters of low intensity pulsed ultrasonic stimulation (LIPUS) waves on the testicular tissue of neonatal mice in the control and experimental groups were evaluated to improve the process of spermatogenesis and aid treatment of infertility with male causes. In the first phase of the study, the temperature was controlled to prevent thermal effects, and in the second and third phases, the optimal intensity and the optimal duty cycle of ultrasonic waves were evaluated, respectively. Histological H&E evaluations indicate that ultrasonic waves with an intensity of 0.5 W/cm^2 and 40% duty cycle during 14 days of organ culture have a better effect on maintaining the structure of testicular tissue compared to other intensities and duty cycles. Additionally, LIPUS waves had a propitious influence on the enhancement of spermatogenesis in the testicular tissue of neonatal mice. Quantitative histological findings showed a significant increase in the area of testicular tissue stimulated by LIPUS compared to the control group ($p<0.05$).

Keywords: Ultrasonic waves, Testicular tissue, Spermatogenesis.

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