

عنوان مقاله:

Low-frequency vibration treatment of bone marrow stromal cells induces bone repair in vivo

محل انتشار:

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خلاصه مقاله:

Objective(s):To study the effect of low-frequency vibration on bone marrow stromal cell differentiation and potential bone repair in vivo. **Materials and Methods:**Forty New Zealand rabbits were randomly divided into five groups with eight rabbits in each group. For each group, bone defects were generated in the left humerus of four rabbits, and in the right humerus of the other four rabbits. To test differentiation, bones were isolated and demineralized, supplemented with bone marrow stromal cells, and implanted into humerus bone defects. Varying frequencies of vibration (0, 12.5, 25, 50, and 100 Hz) were applied to each group for 30 min each day for four weeks. When the bone defects integrated, they were then removed for histological examination. mRNA transcript levels of runt-related transcription factor 2, osteoprotegerin, receptor activator of nuclear factor k-B ligand, and pre-collagen type 1 a were measured. **Results:**Humeri implanted with bone marrow stromal cells displayed elevated callus levels and wider, more prevalent, and denser trabeculae following treatment at 25 and 50 Hz. The mRNA levels of runt-related transcription factor 2, osteoprotegerin, receptor activator of nuclear factor k-B ligand, and pre-collagen type 1 a were also markedly higher following 25 and 50 Hz treatment. **Conclusion:**Low frequency (25–50 Hz) vibration in vivo can promote bone marrow stromal cell differentiation and repair bone injury.

کلمات کلیدی:

Bone injury, Bone marrow stromal cells, Pre-Coha, RUNX γ , Vibration stress

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