
Pulsed electromagnetic fields induced femoral metaphyseal bone thickness changes in the rat.

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Abstract
The effect of 1 Hz, 30 mT pulsed magnetic fields on young adult rat femoral metaphyseal bone thickness was assessed. Ten same litter, female Wistar rats were studied; five of them underwent 30 min magnetic stimulation sessions for 20 consecutive days. The anterior and posterior cortical, as well as trabecular bone transverse thicknesses were measured. The results obtained under clear field microscopy in stimulated and control histological cuts were (in microm) 398 +/- 32 versus 260 +/- 22 (P = 0.002), 380 +/- 68 versus 252 +/- 21 (P = 0.03), and 168 +/- 11 versus 112 +/- 11 (P = 0.002), respectively. The transcranial magnetic stimulation system, approved for human therapy, generates pulsed electromagnetic fields, which induce a significant thickness increase in cortical and trabecular in vivo stimulated bone tissues. This is the first time this effect in healthy animals is shown.

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