http://www.ncbi.nlm.nih.gov/pubmed/12669302(Pulsed Electromagnetic Fields Prevent Osteoporosis in an Ovariectomized Female Rat Model: a Prostaglandin E2-associated Process (2003). "We, therefore, conclude that PEMF may be useful in the prevention of osteoporosis resulting f romovariectomy .")□□

Pulsed electromagnetic fields prevent osteoporosis in an ovariectomized female rat model: a prostaglandin E2-associated process.

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Abstract

With the use of Helmholtz coils and pulsed electromagnetic field (PEMF) stimulators to generate uniform time varying electromagnetic fields, the effects of extremely low frequency electromagnetic fields on osteoporosis and serum prostaglandin E(2) (PGE(2)) concentration were investigated in bilaterally ovariectomized rats. Thirty-five 3 month old female Sprague-Dawley rats were randomly divided into five different groups: intact (INT), ovariectomy (OVX), aspirin treated (ASP), PEMF stimulation (PEMF + OVX), and PEMF stimulation with aspirin (PEMF + ASP) groups. All rats were subjected to bilateral ovariectomy except those in INT group. Histomorphometric analyses showed that PEMF stimulation augmented and restored proximal tibialmetaphyseal trabecular bone mass (increased hard tissue percentage, bone volume percentage, and trabecular number) and architecture (increased trabecular perimeter, trabecular thickness, and decreased trabecular separation) in both PEMF + OVX and PEMF + ASP. Trabecular bone mass of PEMF + OVX rats after PEMF stimulation for 30 days was restored to levels of age matched INT rats. PEMF exposure also attenuated the higher serum PGE(2) concentrations of OVX rats and restored it to levels of INT rats. These experiments demonstrated that extremely low intensity, low frequency, single pulse electromagnetic fields significantly suppressed the trabecular bone loss and restored the trabecular bone structure in bilateral ovariectomized rats. We, therefore, conclude that PEMF may be useful in the prevention of osteoporosis resulting from ovariectomy and that PGE(2) might relate to these preventive effects.

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