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The effect of proton pump inhibitors on bone mineral density in rats

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Background: Increased concerns rose towards the side effects of chronic use of proton pump inhibitors (PPIs). The relationship between prolonged use of PPIs and bone metabolism is still not totally established.

Aim: Aim of this study is to examine the association between the use of (PPIs) and the risk of development osteoporosis.

Method: 180 adult male rats were assigned to three groups (60 rats each). Group I served as control; whereas, group II (a, b), (i.p) omeprazole 20 mg/kg/day was administered for four and eight weeks respectively; group III (a, b), (i.p) omeprazole 40 mg/kg/day was given for the same period. At the end of drug treatment, 20 rats from each subgroup were examined for bone mineral density (BMD), bone mineral content (BMC), serum calcium, phosphorus, parathormone, tartrate resistant acid phosphatase type 5b (TRACP5b), insulin-like growth factor 1 (IGF-1) and osteoprotegerin (OPG). The remaining 10 rats from each subgroup were left without treatment for the next four weeks to detect the reversal effects of the drug.

Results: BMD and BMC decreased in a dose and time dependent manners with recovery. Serum calcium and phosphate decreased at the dose 40 mg/kg for eight weeks with recovery of calcium after discontinuation of therapy but not phosphate. Parathormone increased compared to control with no recovery. TRACP5b increased at 20, 40 mg at eight weeks with no recovery. IGF1 decreased in dose and time dependent manner, recovery only for 20 mg for four weeks. OPG showed no change.

Conclusion: The chronic use of high doses of omeprazole could adversely affect bone homeostasis.

Biography

Layla Ezzat Borham is a Professor of Clinical Pharmacology at Cairo and Umm Al-Qura Universities since 2004. She completed his MSc and MD at Cairo University Medical School. She has been working in Faculty of Medicine, Umm Al-Qura University, KSA for 15 years. During this period, she carried out a lot of scientific and social serving activities through her publications, scientific committee memberships, lectures and administrative work. In addition, she works in the Ministry of Health hospitals and primary health care centres giving awareness lectures to health care providers and patients. She has been awarded a Golden Prize from Umm Al-Qura University for her overall services at the University.

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