STUDENTS' CORNER
LETTER TO THE EDITOR

Long-term Use of Proton Pump Inhibitors (PPIs) and Their Effects on Bone Health

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Dear Editor, More than 25% of the global population suffer from acid-related disorders such as dyspepsia or GERD.[1] Acid-related disorders are frequently treated with proton pump inhibitors (PPIs). PPIs work by irreversibly inhibiting the H^+/K^+ ATPase enzyme, thereby reducing gastric acid secretion and regulating acid production. Since being brought to the market in 1989, their use has grown significantly globally, and they are currently among the top ten medications prescribed in the US and Pakistan. Six medications in this class—omeprazole, esomeprazole, lansoprazole, dexlansoprazole, pantoprazole, and rabeprazole—had received FDA approval as of 2015.[2] PPI prescriptions typically last four to eight weeks. However, long-term use may be necessary for patients with comorbidities who require multiple medications.

PPI use should be carefully considered, particularly for patients whose treatment may last for many years and in third-world countries where people may use drugs based on word-of-mouth recommendations rather than prescriptions due to financial instability and illiteracy. Observational and population-based cohort studies have associated long-term PPI use with an increased risk of pneumonia, major cardiovascular events, dementia, vitamin B12 deficiency, bone fractures, gastric cancer, and kidney injury, among other complications.[1] A possible positive correlation between PPIs and osteoporotic fracture risk, including those of the hip, spine, and wrist, has sparked even more worries.[2]

Prolonged PPI use has been linked to chronic kidney disease (CKD), which impairs vitamin D synthesis, reduces calcium absorption, and subsequently causes hypocalcaemia, increasing the risk of osteoporosis. Additionally, long-term PPI use reduces vitamin B12 absorption, leading to elevated homocysteine levels, which disrupt collagen cross-linking and contribute to osteoporosis.[4]

PPI use has been associated with hyperparathyroidism, vitamin D3 deficiency, hypocalcaemia, hypomagnesemia and a decrease bone mineral density (BMD). Risk factors for reduced BMD include age over 50, menopause, insufficient sun exposure, concomitant use of two PPIs, and daily intake after meals.[3] Rabeprazole is an exception to these effects; it improves glucocorticoid-induced decreased bone mineral density rather than exacerbating bone disorders. Rabeprazole differs from other PPIs due to its reversible inhibition of H^+/K^+ ATPase, which may explain its protective effect on bone mineral density. Thus, rabeprazole may be a preferable option for patients at risk of osteoporosis.[5]

In light of the previously mentioned facts, we would like to call attention to Pakistan's population's excessive and unapproved use of PPIs. Therefore, it is important to regulate the use of PPIs and increase public awareness of their negative long-term effects.

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