

The Effect of Non-Prescribed Medications on Osteoporosis: A Multidisciplinary Approach

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Paper Publication Date: 20th March 2020

Abstract:

Osteoporosis, a disease characterized by decreased bone mass and deterioration of bone tissue, is a major public health issue, particularly among the elderly population. While prescribed medications are commonly used to manage osteoporosis, the role of non-prescribed medications, including over-the-counter (OTC) drugs, supplements, and herbal remedies, in influencing bone health is significant yet often overlooked. This paper explores the impact of non-prescribed medications on osteoporosis from a multidisciplinary perspective, incorporating insights from health administration, radiology, physiotherapy, pharmacy, and family medicine. The analysis aims to provide a comprehensive understanding of the risks and benefits associated with the use of non-prescribed medications in osteoporosis management, emphasizing the need for patient education and professional oversight.

Overview of Osteoporosis

Osteoporosis is a progressive musculoskeletal condition characterized by weakened bones and an increased risk of fractures. It is most prevalent in older adults, particularly postmenopausal women, but it can affect individuals of all ages. The condition is commonly diagnosed using bone mineral density (BMD) tests, such as dual-energy X-ray absorptiometry (DEXA), which provide a quantitative assessment of bone strength (Cosman et al., 2014). Osteoporosis often remains asymptomatic until a fracture occurs, making it a silent but serious health threat (Kanis et al., 2019). According to the National Osteoporosis Foundation, approximately 10 million Americans currently suffer from osteoporosis, with an additional 44 million at risk due to low bone mass (Cosman et al., 2014). The significant healthcare costs associated with osteoporosis-related fractures further underscore the importance of effective management strategies.

Prevalence and Impact of Non-Prescribed Medications

Non-prescribed medications, including OTC drugs, supplements, and herbal remedies, are commonly used by patients with osteoporosis, often without professional guidance. While some of these agents may support bone health, others can interfere with bone metabolism and exacerbate osteoporosis. For example, a reliance on OTC pain relievers like NSAIDs can mask underlying issues while negatively affecting bone healing processes (Pountos et al., 2012). Non-prescribed medications offer a cost-effective and accessible alternative to prescription treatments, but their unsupervised use can lead to adverse effects, particularly when combined with prescribed osteoporosis therapies (Cohen & Ernst, 2010).

Furthermore, the widespread use of herbal supplements among older adults poses additional concerns. Herbal supplements are often perceived as safe due to their natural origin, but many lack rigorous clinical testing and may interact negatively with other medications (Cohen & Ernst, 2010). The lack of regulation in the supplement industry further exacerbates the risks, as patients may be unaware of the correct dosages or potential side effects of these products. Therefore, understanding the full impact of non-prescribed medications on osteoporosis requires a comprehensive, multidisciplinary approach.

Multidisciplinary Approach

The management of osteoporosis, particularly in the context of non-prescribed medications, requires a multidisciplinary approach. The perspectives of health administration, radiology, physiotherapy, pharmacy, and family medicine are crucial for understanding the complex interactions between non-prescribed medications and bone health. By integrating these diverse healthcare specialties, patients can receive more holistic care that addresses not only their bone health but also the potential risks associated with unsupervised medication use. This paper integrates the contributions of each discipline to provide a comprehensive analysis of how non-prescribed medications affect osteoporosis.

Non-Prescribed Medications and Their Impact on Osteoporosis

1. Nonsteroidal Anti-Inflammatory Drugs (NSAIDs)

NSAIDs are commonly used for pain relief, including pain associated with osteoporotic fractures. However, their long-term use may negatively impact bone healing and remodeling. NSAIDs inhibit the synthesis of prostaglandins, which play a crucial role in bone repair and remodeling. Studies have shown that prolonged NSAID use can impair bone mineral density (BMD) and delay fracture healing, particularly in older adults (Pountos et al., 2012). Pountos et al. (2012) conducted a critical analysis that highlighted the negative effects of NSAIDs on bone healing, suggesting that their use should be carefully monitored in osteoporosis patients. Moreover, NSAIDs have been associated with gastrointestinal complications, which can further interfere with nutrient absorption, including calcium, a key mineral for bone health. Long-term NSAID use can also lead to renal impairment, which can affect the body's ability to maintain proper calcium and phosphorus levels, thereby exacerbating bone loss (Hiligsmann et al., 2019). Given these risks, healthcare providers must balance the need for pain relief with the potential long-term consequences of NSAID use in osteoporosis management.

2. Antacids and Bone Health

Antacids, particularly those containing aluminum, are frequently used to treat gastrointestinal discomfort. However, aluminum-containing antacids can interfere with calcium absorption, leading to weakened bones and an increased risk of osteoporosis (Spencer et al., 1982). Spencer et al. (1982) demonstrated that even small doses of aluminum-containing antacids can disrupt calcium and phosphorus metabolism, which are critical for maintaining healthy bone structure. Patients using these medications without medical oversight may unintentionally aggravate their osteoporosis.

Additionally, the use of proton pump inhibitors (PPIs) as long-term antacid therapy has been linked to reduced calcium absorption, further increasing the risk of osteoporosis-related fractures (Cosman et al., 2014). PPIs reduce stomach acid, which is necessary for calcium solubilization and absorption. Consequently, patients on long-term PPI therapy are often at higher risk for bone fractures. Therefore, it is essential that healthcare providers monitor the use of these medications in patients with osteoporosis and explore alternative treatments for gastrointestinal issues when necessary (Kanis et al., 2019).

3. Calcium and Vitamin D Supplements

Calcium and vitamin D are essential for maintaining bone health, and their deficiency is a well-known risk factor for osteoporosis. Many individuals with osteoporosis or at risk of the condition take calcium and vitamin D supplements without a prescription. While these supplements can be beneficial, excessive calcium intake has been associated with an increased risk of kidney stones and cardiovascular problems (Martini & Wood, 2006). It is crucial to balance calcium and vitamin D intake to prevent hypercalcemia, which can negatively affect bone health and overall metabolism (Cosman et al., 2014).

Vitamin D deficiency is also common among older adults, particularly those with limited sun exposure, which can further exacerbate osteoporosis. However, excessive vitamin D supplementation can lead to toxicity, resulting in hypercalcemia and potential damage to the kidneys and cardiovascular system (Martini & Wood, 2006). The National Osteoporosis Foundation recommends that calcium and vitamin D intake be carefully monitored and tailored to each patient's specific needs, with professional guidance from healthcare providers (Cosman et al., 2014).

4. Herbal Supplements

Herbal supplements, such as those containing phytoestrogens, are often marketed as natural remedies for osteoporosis, particularly for postmenopausal women. Phytoestrogens mimic the effects of estrogen, which is known to protect against bone loss. However, the safety and efficacy of herbal supplements in osteoporosis management remain controversial. Cohen and Ernst (2010) reviewed the safety of herbal supplements and highlighted the lack of regulation and potential for harmful interactions with prescribed medications. Given

the inconsistent quality and dosage of herbal products, their use should be approached with caution in osteoporosis management.

Furthermore, some herbal supplements, such as those containing high levels of vitamin K, may interfere with anticoagulant medications commonly prescribed to older adults, increasing the risk of thromboembolic events (Cohen & Ernst, 2010). The potential for such interactions underscores the importance of healthcare providers being informed about all medications and supplements their patients are taking. In the absence of professional guidance, patients may inadvertently compromise their treatment outcomes or exacerbate their risk of fractures.

Multidisciplinary Contributions

1. Technician in Health Administration

A Technician in Health Administration plays a key role in managing the healthcare system's response to osteoporosis and ensuring that patients are educated about the safe use of non-prescribed medications. Health administrators are responsible for developing policies and systems that promote safe medication practices and prevent adverse drug interactions. By implementing robust electronic health record (EHR) systems and educational programs, health administrators can enhance the monitoring of medication use among osteoporosis patients (Nielsen et al., 2010). Additionally, they can facilitate communication between healthcare providers and patients to ensure that non-prescribed medications are used safely and effectively.

Health administrators can also contribute by coordinating multidisciplinary care teams to ensure that patients receive comprehensive care. For example, implementing standardized protocols for osteoporosis management that include regular screenings for non-prescribed medication use can help identify potential risks early and allow for timely interventions. By promoting a culture of safety and education, health administrators play a crucial role in minimizing the negative impact of non-prescribed medications on osteoporosis.

2. Radiology Specialist

Radiology plays a critical role in diagnosing and monitoring osteoporosis, particularly through the use of DEXA scans, which measure bone mineral density (Kanis et al., 2019). A Radiology Specialist can assess the impact of non-prescribed medications on bone density, particularly in patients who use medications that may negatively affect bone health, such as NSAIDs or antacids. Regular imaging allows for the early detection of changes in bone density, which can prompt timely interventions. Radiologists can also work with family medicine consultants and pharmacists to adjust treatment plans based on imaging results (Body et al., 2011). Radiologists are also pivotal in monitoring the progression of osteoporosis over time, particularly in patients who may be unknowingly using medications that contribute to bone loss. By comparing serial DEXA scans, radiologists can identify trends in bone density loss and work with other specialists to modify treatment plans accordingly. This collaborative approach ensures that patients receive the most effective care and reduces the likelihood of fractures and other complications.

3. Senior Physiotherapist

Physiotherapy is essential in managing osteoporosis, particularly in preventing fractures by improving mobility, strength, and balance. Non-prescribed medications, such as certain herbal supplements and antacids, can impair coordination and increase the risk of falls in individuals with osteoporosis. A Senior Physiotherapist can evaluate the effects of these medications on a patient's physical function and design exercise programs that counteract potential side effects. For example, if a patient is taking medications that cause dizziness or weakness, a tailored exercise regimen can improve their balance and reduce fall risk (Hale & Goehring, 2003).

In addition, physiotherapists can play a preventative role by educating patients on the importance of maintaining muscle strength and flexibility to support bone health. Physiotherapy programs that focus on weight-bearing exercises and resistance training can help stimulate bone formation and slow the progression of osteoporosis (Cosman et al., 2014). By addressing the physical side effects of non-prescribed medications and promoting overall musculoskeletal health, physiotherapists contribute significantly to the multidisciplinary management of osteoporosis.

4. Pharmacy Technician

Pharmacy Technicians are at the forefront of patient interaction, often providing the first line of guidance regarding OTC medications and supplements. In the context of osteoporosis, Pharmacy Technicians can educate patients on the appropriate use of calcium and vitamin D supplements and caution against the

prolonged use of medications that may harm bone health, such as NSAIDs and aluminum-containing antacids (Hiligsmann et al., 2019). Pharmacy Technicians must also be aware of potential interactions between non-prescribed medications and prescription drugs, ensuring that patients receive comprehensive advice on their medication regimen.

Moreover, Pharmacy Technicians can play a crucial role in identifying patients who may be at risk of self-medicating with potentially harmful substances. By actively engaging with patients and asking about their use of non-prescribed medications, Pharmacy Technicians can flag potential issues for further review by healthcare providers. This proactive approach helps prevent adverse interactions and supports the safe use of medications in osteoporosis management.

5. Family Medicine Consultant

Family Medicine Consultants provide holistic care to patients with osteoporosis, monitoring the use of both prescribed and non-prescribed medications. They are ideally positioned to assess the long-term impact of non-prescribed medications on bone health and to advise patients on safe medication practices. Family Medicine Consultants can also collaborate with other specialists, such as radiologists and physiotherapists, to provide a comprehensive care plan that minimizes the risk of fractures and promotes overall bone health (Nielsen et al., 2010).

Family Medicine Consultants are often the first point of contact for patients with osteoporosis, making them key players in educating patients about the risks associated with non-prescribed medications. By maintaining a thorough understanding of each patient's medical history and current medication use, Family Medicine Consultants can tailor treatment plans that minimize the risk of drug interactions and ensure that patients receive the most appropriate care. Their holistic approach to patient management is essential for optimizing outcomes in osteoporosis treatment.

Risks Associated with Non-Prescribed Medications in Osteoporosis

The unsupervised use of non-prescribed medications poses significant risks to individuals with osteoporosis. Long-term use of NSAIDs can impair bone healing and increase fracture risk, particularly in older adults (Pountos et al., 2012). Antacids, especially those containing aluminum, can disrupt calcium absorption, further weakening bones and exacerbating osteoporosis (Spencer et al., 1982). While calcium and vitamin D supplements are essential for bone health, excessive use can lead to hypercalcemia and kidney stones, highlighting the need for professional guidance in determining the appropriate dosage (Martini & Wood, 2006).

Herbal supplements, marketed as natural remedies for osteoporosis, present additional risks due to their lack of regulation and potential for adverse interactions with prescribed treatments. Cohen and Ernst (2010) emphasized that the safety of herbal supplements remains uncertain, and patients should be cautioned against using these products without consulting a healthcare provider. Additionally, the interaction of herbal supplements with anticoagulants and other medications used by older adults can lead to serious health complications, further underscoring the need for medical supervision.

Benefits of Non-Prescribed Medications in Osteoporosis Management

When used appropriately, non-prescribed medications can offer benefits for individuals with osteoporosis. Calcium and vitamin D supplements, when taken in the correct dosage, are crucial for maintaining bone health and preventing fractures (Cosman et al., 2014). OTC pain relievers, including NSAIDs, can provide temporary relief from fracture-related pain, allowing patients to maintain mobility and engage in physical therapy (Pountos et al., 2012). However, these benefits must be weighed against the potential risks, and patients should be encouraged to seek professional advice before using non-prescribed medications for osteoporosis management.

Recommendations for Safe Use

To minimize the risks associated with non-prescribed medications in osteoporosis management, healthcare providers should adopt a proactive approach to patient education and medication monitoring. The following strategies are recommended:

Patient Education: Patients should be informed about the potential risks and benefits of non-prescribed medications and encouraged to consult with healthcare providers before starting any new treatment.

Educational programs that increase patient knowledge about osteoporosis and medication safety can improve treatment adherence and outcomes (Nielsen et al., 2010).

Regular Monitoring: Bone density assessments, such as DEXA scans, should be performed regularly to monitor the effects of non-prescribed medications on bone health. If significant changes in bone density are detected, healthcare providers should reassess the patient's medication regimen (Kanis et al., 2019).

Interdisciplinary Collaboration: A multidisciplinary approach is essential for managing osteoporosis and ensuring the safe use of non-prescribed medications. Health administrators, radiologists, physiotherapists, pharmacists, and family medicine consultants should work together to provide comprehensive care and minimize the risk of fractures (Hale & Goehring, 2003).

Regulation and Oversight: Stricter regulation of herbal supplements and OTC medications is needed to ensure their safety and efficacy. Healthcare providers should advocate for increased oversight of these products and advise patients to use only those that have been clinically tested and approved (Cohen & Ernst, 2010).

Conclusion

Non-prescribed medications have a significant impact on osteoporosis, both positively and negatively. While some OTC drugs and supplements can support bone health, their unsupervised use can lead to adverse effects, particularly in individuals with osteoporosis. A multidisciplinary approach, involving health administration, radiology, physiotherapy, pharmacy, and family medicine, is essential for managing the safe use of non-prescribed medications in osteoporosis patients.

Technicians in health administration can implement systems to monitor medication use, radiologists can assess the impact of medications on bone density, physiotherapists can mitigate the physical side effects of certain medications, pharmacy technicians can educate patients on safe medication practices, and family medicine consultants can provide holistic care that promotes long-term bone health. By working together, these specialists can provide comprehensive care that minimizes the risk of fractures and improves the quality of life for individuals with osteoporosis.

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