

APPROACHES TO THE DIAGNOSIS AND TREATMENT OF PRIMARY OSTEOPOROSIS

Rakhimov Sardorbek Samandarovich

Tashkent State Medical University, Department of Internal Medicine No. 2 in Family Medicine, Tashkent, Uzbekistan.

Resume

Back pain is a common medical and social problem requiring a thorough differential diagnosis and appropriate treatment from physicians of all specialties. Both physicians and patients often underestimate the role of metabolic skeletal diseases in the development of acute and chronic pain. This article presents a clinical case of primary (postmenopausal) osteoporosis in a 66-year-old female patient with clinically manifest primary generalized osteoarthritis. A detailed analysis of the algorithm of standard and additional diagnostic procedures is provided, along with indications for use and the selection of a drug for pathogenetic therapy. The presence of metabolic skeletal disease was suspected based on back pain in this elderly patient, which began at a late age (over 50 years), and a height loss of more than 4 cm compared to her height at age 25. The diagnosis was made clinically based on radiographic data (lumbar vertebral fracture) and confirmed by laboratory testing. When determining the treatment tactics, the risk of fracture was taken into account, in particular, which in the presented observation was assessed as high.

Key words: osteoarthritis, back pain, osteoporosis, low-energy fracture, antiresorptive therapy, bisphosphonates.

Introduction

Osteoporosis is a multifactorial metabolic skeletal disease characterized by decreased bone mineral density (BMD) and microarchitectural deterioration, leading to decreased bone strength and associated with a high risk of fracture. Osteoporosis is currently considered one of the leading causes of disability, decreased quality of life, and premature mortality in the elderly [1, 2]. In terms of medical significance, metabolic skeletal diseases rank fourth, behind only cardiovascular diseases, cancer, and diabetes. The absence of obvious symptoms for a long time makes osteoporosis a very insidious condition, which may only manifest itself with a fracture. If a high individual 10-year probability of major low-energy fractures is detected, treatment is recommended. According to epidemiological studies, 31% of women and 4% of men over 50 years of age require pathogenetic therapy for osteoporosis [2]. The results of cross-sectional epidemiological studies conducted in some cities of the Russian Federation indicate a fairly high prevalence of BMD reduction of varying severity in individuals aged 50 years and older [4]. Thus, in the age group over 50 years, 58.8% of residents of Cheboksary, 55.8% of residents of Perm, 35.3% of residents of Yekaterinburg require the prescription of medications for the prevention and treatment of osteoporosis. Primary osteoporosis develops as an independent disease in the absence of another cause of reduced skeletal strength and accounts for 85% of osteoporosis in postmenopausal women and 80% in men over 50 years of age [5]. Other forms of primary osteoporosis, such as idiopathic osteoporosis, which develops in women before menopause and in men under 50 years of age, and juvenile osteoporosis, diagnosed in children and adolescents, are less common. Secondary osteoporosis develops as a result of various diseases or conditions, or the use of certain medications; i.e., there is a specific cause leading to osteoporosis.

According to the Federal Clinical Guidelines for the Diagnosis, Treatment, and Prevention of Osteoporosis (2017), when low-energy fractures of large bones (femur, vertebrae, multiple fractures) are detected, it is recommended to establish a diagnosis of osteoporosis and prescribe therapy regardless of the results of densitometry or FRAX (provided that other skeletal diseases

are excluded) [1]. The choice of treatment method will be determined by the type of disease, the degree of BMD loss, the presence of low-energy fractures and comorbidities, individual patient characteristics, polypharmacy, and other factors. However, as experience shows, establishing a diagnosis and selecting the optimal medication are associated with certain difficulties. We present a clinical observation of a patient with primary osteoporosis with an analysis of the tactics for choosing drug therapy.

Clinical observation

A 66-year-old female patient consulted a rheumatologist complaining of pain along the anteromedial surface of the right knee joint and upper leg, which occurred when walking on rough terrain and when descending stairs, as well as moderate pain in the lumbar spine, which worsened when standing for a long time. She considers herself ill for the past 10 years, with the onset of mechanical pain in her left knee joint, which she attributed to heavy physical exertion. She used a course of treatment with a combination of chondroitin sulfate and glucosamine, as well as oral and topical nonsteroidal anti-inflammatory drugs, with clinical improvement. In recent years, she has noticed changes in the shape of her fingers at the interphalangeal joints, with the formation of Heberden's and Bouchard's nodes. The patient's family history is burdened on the maternal side (her mother suffered from osteoarthritis and suffered a pathological fracture of the proximal femur at age. On physical examination, the knee joints were visually normal, with tenderness upon palpation and crepitus during passive knee motion. Her body mass index was 28.8 kg/m², and her current height is 156 cm, 5 cm shorter than her height at age 25. When assessing laboratory parameters, attention was drawn to an increase in the level of total cholesterol in the blood to 6.9 mmol/l, ESR according to Westergren to 28 mm/h, C-reactive protein to 6 mg/l. X-ray examination of the knee joints revealed uneven narrowing of the joint space, mainly in the medial sections, the presence of moderate osteophytes on the edges of the articular surfaces of the tibia and femur, and mild subchondral osteosclerosis of the articular surface of the tibia, which was assessed as bilateral osteoarthrosis of the knee joints, stage II X-ray. Thus, based on the clinical picture and laboratory and instrumental data, it was suggested that the patient had a clinically manifest form of primary generalized osteoarthritis. The rheumatologist was faced with the task of determining the origin of pain in the lumbar spine. Lower back pain can be classified as nonspecific, specific, and radicular. Most patient visits (85%) for back pain are related to nonspecific pain due to dysfunction of the musculoskeletal system, spondylosis, or herniated discs [6]. Specific back pain is 10 times less common (7–8% of cases); however, it is precisely this type of pain that determines an unfavorable prognosis and requires active diagnostic and therapeutic interventions by medical specialists (rheumatologists, neurosurgeons, oncologists, cardiac surgeons, etc.). The combination of back pain in an elderly patient with onset at a late age (over 50 years) and a height loss of more than 4 cm compared to her height at age 25 requires medical attention and is considered a "danger sign." In this clinical situation, radiography of the lower thoracic and lumbar spine is mandatory to rule out vertebral fractures due to osteoporosis. Accordingly, in this situation—an identified spontaneous fracture—the diagnosis of postmenopausal osteoporosis can be established clinically. According to clinical guidelines, all patients with a newly diagnosed osteoporosis require additional laboratory testing, including determination of total calcium, phosphorus, creatinine, alkaline phosphatase activity, and vitamin 25(OH)D₃ [1]. If a vertebral fracture is detected, a proteinogram is indicated. Routine assessment of the recommended biochemical blood parameters in the patient revealed no disturbances in phosphorus-calcium metabolism, with the exception of a low level of vitamin 25(OH)D₃ (6.5 ng/ml). The latter was regarded as a vitamin D deficiency requiring mandatory correction before the start of pathogenetic therapy. The patient was recommended to undergo saturation therapy with cholecalciferol for 8 weeks (the course dose of the drug is 400,000 IU) [8]. The individual 10-year probability of major osteoporotic fractures (based on the FRAX score) was 22%. Dual-energy X-ray densitometry (DXA) revealed

a predominant decrease in BMD in the lumbar spine (L2–L4): T-score -3.2 SD. The combination of clinical and laboratory-instrumental data also made it possible to diagnose the patient with a severe form of postmenopausal osteoporosis, which requires pathogenetic anti-osteoporotic therapy. According to this algorithm, a high fracture risk is an indication for initiating parenteral therapy. The drugs of choice in this situation may include intravenous bisphosphonates (zoledronic acid or ibandronate), denosumab, or teriparatide [9]. Pathogenetic therapy should be administered alongside regular calcium and vitamin D supplementation, and therapy can be initiated after vitamin D deficiency has been corrected. In cases of multiple vertebral and peripheral bone fractures, the bone anabolic drug teriparatide may be preferred as first-line therapy [10]. Following anabolic therapy, antiresorptive therapy may be continued. Bisphosphonates are capable of active and long-term accumulation in bone tissue, primarily in areas of bone resorption. This means that the risk of fractures in patients with osteoporosis remains low even for several years after completion of treatment, allowing for a "drug holiday." According to clinical guidelines, treatment of osteoporosis with bisphosphonates can be continued for 5 years when administered in tablet form and for at least 3 years when administered intravenously [11]. In this clinical case report, zoledronic acid (Osteostatix), a 5 mg/100 ml intravenous infusion solution administered annually, and ibandronic acid (Rezoviva) 3 mg/3 ml, administered as a short (15–30 sec) bolus injection every 3 months, were considered as alternatives. Intravenous ibandronate has higher bioavailability than the oral form (100% versus 0.6%). The independence of food intake and body position after administration and safe use in patients with upper gastrointestinal pathology are also factors in the choice of injectable bisphosphonates.

Conclusion

This clinical observation confirms that osteoporosis can remain hidden for a long time under the guise of comorbidities, with the first manifestation being a fracture. More careful clinical judgment, diagnosis, awareness of the problem, and vigilance for osteoporosis will enable timely detection and specific care for patients with.

1. Bashkova IB, Madyanov IV, Markova TN, Semenova ON. Prevalence of osteoporosis and osteopenia of the distal forearm and the risk of osteoporotic fractures in residents of Cheboksary over 50 years of age. *Bulletin of the Chuvash University*. 2012;3:296–303.
2. Stovall DW, ed. *Osteoporosis. Diagnostics and Treatment*. Transl. from English. Moscow: GEOTAR-Media; 2015.
3. Borodulina IV, Suponeva NA, Badalov NG. Nonspecific back pain: clinical and pathogenetic features and treatment options. *RMJ*. 2016;25:1699–1704.
4. Kadyrova LR, Bashkova IB, Kiseleva IN, et al. A patient with back pain: what is hidden under the diagnosis of "osteochondrosis". *RMJ*. 2016;14:886–893.
5. Pigarova EA, Rozhinskaya LY, Belaya ZhE, et al. Clinical guidelines of the Russian Association of Endocrinologists for diagnosis, treatment and prevention of vitamin D deficiency in adults. *Problems of Endocrinology*. 2016;4:60–84.
6. Mazurov VI, Lesnyak OM, Belova KY. Algorithms for choosing osteoporosis therapy in primary health care and organizing preferential drug provision for certain categories of citizens entitled to receive state social assistance. *Systematic review and resolution of the*

expert council of the Russian Osteoporosis Association. Preventive medicine. 2019; 22(1): 57–65. DOI: 10.17116/profmed20192201157.

7. Belaya Zh.E., Rozhinskaya L.Ya. Anabolic therapy of osteoporosis. Teriparatide: efficacy, safety and scope of application. Osteoporosis and osteopathy. 2013; 2: 32–40.