



# Type 2 Diabetes Complicated with Osteoporosis in Aged People

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## Abstract

The risk of osteoporosis and fracture in diabetic patients is obviously higher than that in non-diabetic patients. So far, the effective prevention and control of diabetes, osteoporosis and osteoporotic fracture still faces enormous challenges. Elderly patients with diabetes and osteoporosis should be given reasonable intervention treatment because of individualized comprehensive evaluation.

**Keywords:** Aging; Diabetes; Osteoporosis.

## Introduction

As a chronic metabolic disease, diabetes is often accompanied by complications of abnormal metabolism of bone tissue, resulting in changes in bone structure or quality, leading to diabetes-related osteoporosis. Osteoporosis-related fracture has high disability rate and death rate, so it is called a silent epidemic and is a more serious silent killer than diabetes. The risk of osteoporosis and fracture in diabetic patients is significantly higher than that in non-diabetic patients, including type 1 and type 2 diabetes. A large number of studies have shown that type 1 diabetes can lead to the decrease of bone density. However, the correlation between type 2 diabetes mellitus and bone mineral density is affected by many secondary factors, and there is no unified conclusion at present [1]. However, existing data show that type 2 diabetes is a risk factor for bone density related fractures, and the risk of hip fractures is 1.7 times higher than that of non-diabetic patients [2].

Osteoporosis is characterized by decreased bone strength, and its diagnosis mainly depends on dual-energy X-ray absorptiometry to measure bone density. However, some factors related to bone strength, such as bone microstructure, cannot be measured in bone

density measurement. Patients with type 2 diabetes are usually characterized by low bone turnover osteoporosis, with decreased osteoblast activity and impaired bone repair ability, which makes it difficult to discriminate by bone density test. The influence of T2DM on bone is also manifested in bone matrix, bone structure and bone metabolism, so that bone density has limitations in predicting fracture risk of diabetic patients [3-7].

As two common metabolic diseases in elderly patients, type 2 diabetes and osteoporosis coexist and influence each other, which leads to the occurrence of diabetic osteoporosis. A survey of 87 224 osteoporosis patients in Israel showed that 18% had diabetes. Compared with non-diabetic patients, the prevalence of fractures in all major parts (including hip, vertebral body, humerus and forearm) was significantly higher (44% vs 32%), and the bone density of diabetic patients was higher than that of non-diabetic patients [8].

In the Framingham study, high resolution peripheral quantitative CT (HR-pQCT) scan was performed on 1 069 community people. The results showed that compared with non-diabetic patients,

the cortical bone density of elderly patients with type 2 diabetes decreased, the tibia microstructure was damaged, and the cross-sectional area was smaller [9].

Osteoporosis fracture is one of the main causes of disability and death in elderly patients. Within one year after hip fracture, 20% patients will die from various complications, and about 50% patients will become disabled, and their quality of life will obviously decrease. A study in Spain investigated 126 035 people aged 65-80 years, which showed that compared with non-diabetic patients, the mortality rate of male type 2 diabetic patients after hip fracture increased by 28%, and that of female patients increased by 57% [10]. The medical treatment and nursing of osteoporosis and fracture need to invest a lot of manpower, material resources and financial resources, resulting in heavy family and social burden. Therefore, the ultimate goal of osteoporosis treatment is to prevent the occurrence or recurrence of brittle fracture, which is an important way to reduce mortality and social and economic burden.

For the treatment of elderly diabetic patients with osteoporosis, it is necessary to consider the diagnostic methods of osteoporosis and the threshold of using anti-osteoporosis agents, the effectiveness of anti-osteoporosis agents for diabetic patients, the treatment choice of anti-diabetic drugs and other diabetic complications. Reasonable intervention because of individualized comprehensive evaluation of elderly patients with diabetes mellitus and osteoporosis may increase the pertinence and compliance of treatment, reduce adverse reactions and improve the quality of life.

### Conflict of Interest

None.

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