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Short Communication

Note on Prevention and Treatment of Osteoporosis in COPD

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DESCRIPTION

Patients with Chronic Obstructive Pulmonary Disease (COPD) are at increased risk for osteoporosis and fractures due to lifestyle factors, general effects of the disease, side effects of treatment, and comorbidities. The initial analysis of COPD men for osteoporosis should include a detailed history and physical examination, assessment of COPD severity, and extra tests, as instructed by the results of clinical analysis. Osteoporosis is diagnosed on the basis of Bone Mineral Density (BMD) measurement with DEXA of the lumbar spine and hip, however, fracture risk assessments tools, such as FRAX, can be used as helpful supplements to BMD assessments for therapeutics interventions. The prevention and treatment of osteoporosis in COPD involves nonpharmacologic and medical measures, such as lifestyle measures and nutritional recommendations, management of COPD treatment (based on the use of restricted corticosteroids doses), and drug therapy (bisphosphonates, teriparatide).

Chronic Obstructive Pulmonary Disease (COPD) is a major cause of morbidity and mortality worldwide and a secondary reason for bone loss. It's characterized by a progressive flowing limitation that's not absolutely reversible and develops as a consequence of genetic conditions, increasing life span, environmental, and lifestyle factors. The degree of airflow limitation may be assessed by spirometry and stratified in accordance with the Global Initiative for Chronic Obstructive Pulmonary Disease [1]. Osteoporosis may be a common systemic skeletal disease characterized by low bone mass with microarchitectural disruption and skeletal fragility, leading to a risk of fracture, most typically at the spine, hip, or wrist joint and inflicting vital morbidity and mortality.

Osteoporosis in men continues to be underdiagnosed and untreated because of the rather exclusive specialize on postmenopausal osteoporosis in the past; steroid and alcohol use and hypogonadism are the most frequent secondary causes of male osteoporosis. Though osteoporosis is less prevalent in men, it's been calculable that 30% of all hip fractures occur in males and one in eight men older than fifty years can expertise an osteoporotic fracture. Moreover, several studies have shown that osteoporotic fractures are related to bigger morbidity and mortality in men compared with women [2].

The majority of COPD patients in clinical observation are men of older age with several underdiagnosed risk factors for osteoporosis. Patients with COPD are at increased risk for osteoporosis and fractures because of lifestyle factors, general effects of the disease, side effects of treatment, and comorbidities. It's marked that COPD and osteoporosis share some common risk factors. The present or past tobacco smoking, inactivity, and weight loss (known as pulmonic cachexia) in COPD patients are related to decrease Bone Mineral Density (BMD) and increased risk of fractures.

Also, COPD itself is an independent predictor of BMD reduction and bone fracture risk, and increasing disease severity increases the chance for osteoporosis and fracture risk. It can be explained, as a result of mediators, inflammatory cytokines that induce expression of RANKL (receptor activator of nuclear factor-κB ligand) and RANKL-mediated bone resorption. Additionally, several different cytokines are found to act with the OPG (osteoprotegerin)/RANKL system, supporting the idea that inflammatory mediators contribute to the regulation of bone remodelling. Moreover, COPD patients or different chronic diseases patients usually have deficient calcium (Ca) and vitamin D nutritional status, and therefore the latter is usually accentuated because of very little exposure to daylight.

Among obtainable treatments for COPD, only Corticosteroid (CS) treatment has documented adverse effects of clinical significance. Oral glucocorticosteroids (OGCS) have both direct adverse effects on bone and indirect effects because of muscle weakening and atrophy. These effects are dose-dependent each concerning daily dose, duration, and accumulative dose. Less negative effects are seen by intermittent compared to continuous use; however, lower continuous doses have less detrimental effects on bone than the frequent high-dose courses of OGCS [3]. General OGCS will cause a speedy bone loss within the first few months of treatment, followed by a slower 2%–5% loss per year with chronic use.

However, OGCS is recommended just for seven to ten days with 30 to 40 mg prednisolone in patients with severe COPD; long-

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term treatment with OGCS isn't recommended in COPD. High doses of Inhaled Corticosteroids (ICS) appear to increase bone loss, however, the extent of this result is mentioned as a result of it's difficult to differentiate between the effect of ICS dose used, different risk factors, previous and concomitant use of OGCS. A recent study, addressing static and dynamic indices of cancellated and cortical bone structure in postmenopausal women with COPD who had not received chronic OGCS, revealed skeletal microstructural abnormalities in cancellated and cortical bone providing proof of the high prevalence of vertebral fractures during this illness [4,5].

It's necessary to prevent fractures in COPD patients, considering that hip and vertebral fractures would possibly impair mobility, and vertebral fractures reduce back respiratory organ operation decreasing the Forced Vital Capacity (FVC), like increased operative risk and risk of death of those patients following osteoporotic hip fractures. The prevalence of osteoporosis and osteopenia (low bone mass) in COPD patients varies between 9%–68% and 27%–67%, severally, looking at the diagnostic ways used, the population studied, and therefore the severity of the underlying respiratory disease. In COPD patients, the prevalence of osteoporosis is assumed to be two to multiple above that in age-matched subjects without airflow obstruction. During a recently developed screening tool for males in danger for osteoporosis, the presence of COPD is one of the parameters increasing this risk almost four times.

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