fractures from 1990 to 2050. This increase is mainly attributed to the greater increase in life expectancy for men than for women. However, it is not certain whether these estimates will actually materialize. Although in some countries a steady increase in the incidence of hip fractures is observed, in others the number of these types of fractures remains stable or is even decreasing. Moreover, there is a difference in the incidence between the two sexes and between different age groups. In summary, most studies reveal a tendency to a greater increase of osteoporotic fractures in men compared to women.

CLASSIFICATION OF OSTEOPOROSIS IN MEN

Osteoporosis in men can be classified as primary or secondary depending on the presence of an underlying cause (Table 1). Primary osteoporosis can be further divided into age-related and idiopathic, which latter most commonly appears in younger adult males (<60 years of age). The incidence of secondary osteoporosis in men varies from 30 to 70%. A Greek study reported the presence of a secondary cause for osteoporosis in men in 43% of cases. Thanks to advances in medical technology and proper screening of the population these numbers are likely to increase in the future. The most common causes of secondary male osteoporosis include alcohol abuse, glucocorticoid intake and hypogonadism, these factors having been attributed to up to 45% of affected men according to some studies. In the aforementioned Greek study, 11.4% of cases of secondary osteoporosis were attributed to glucocorticoids and 10% to hypogonadism. It is common for more than two factors to co-exist and contribute to the presence of secondary osteoporosis.

PATHOGENESIS OF BONE LOSS IN MEN

Primary male osteoporosis is divided into age-related and idiopathic, occurring in younger men. There is controversy in the literature concerning the age limit for the definition of idiopathic osteoporosis. Some authors report that the age of 60 years should be used, while others propose that the age of 65 or even 70 years would be more appropriate. Taking into account that the age-related changes in the male skeleton occur early in adult life and that failure to achieve adequate peak bone mass at a young age is one of the factors leading to osteoporosis, the pathogenesis of these two types of primary male osteoporosis is

TABLE I. Classification of osteoporosis in men

I. PRIMARY
- Age-related
- Idiopathic

II. SECONDARY due to:
A. Endocrine disorders
   - Hypercortisolaemia (e.g. Cushing’s syndrome)
   - Hypogonadism
   - Hyperparathyroidism
   - Hyperthyroidism
   - Diabetes mellitus (type 1 and 2)
B. Gastrointestinal disorders
   - Malabsorption syndromes
   - Inflammatory bowel disease (Crohn’s disease, ulcerative colitis, celiac disease)
   - Primary biliary cirrhosis
   - Liver failure
   - Gastrectomy
C. Medication
   - Glucocorticosteroids
   - GnRH-analogue
   - Thyroid hormones
   - Anticonvulsants
   - Chemotherapy
   - Anticoagulants
   - Antidiabetics
D. Systematic diseases
   - Rheumatoid arthritis
   - Ancylosing spondylitis
   - Systemic mastocytosis
   - Neoplasms (e.g. multiple myeloma)
E. Genetic diseases
   - Osteogenesis imperfecta
   - Cystic fibrosis
   - Homozygous β-thalassaemia
   - Sickle cell anaemia
   - Homocystinuria
F. Various conditions
   - Renal failure
   - Idiopathic hypercalciuria
   - Chronic obstructive pulmonary disease
   - Transplantation
   - Neuromuscular diseases
   - Immobilization
   - Alcoholism
   - Smoking
   - Malnutrition