

THE PROBLEM OF OSTEOPOROSIS

Critical Review

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Fracture of the neck of the femur is an injury often sustained by elderly women, and recent epidemiological surveys have suggested that osteoporosis may be an important predisposing factor. The problem of osteoporosis therefore compels our attention, though it must be admitted that we still do not understand all the important points. Long ago Pommer (1885) recognised osteoporosis or "simple atrophy" of bone. He distinguished it from osteomalacia, the condition in which defective calcification of the skeleton is shown by excess of osteoid tissue often arising from lack of vitamin D (Figs. 1 to 3). Unfortunately, the term osteoporosis has been used loosely to mean thinning of bone as shown in radiographs no matter what the cause, and it has been suggested that we call it "osteopenia." This means no more than that there is too little bone or bone atrophy, and not until we know more of the pathological changes can such a new term be justified. We should still use the old term osteoporosis, at the same time adhering to the precise meaning given to it by Albright, a disease characterised by atrophy of bone—that is to say, the bone is qualitatively normal but there is too little of it.

The final court of reference must clearly be based on histological examination. The diagnosis of osteoporosis is usually reached on radiographic evidence of thinning of bone when biochemical tests have excluded other possible causes. The conditions which in radiographic appearance may simulate osteoporosis can usually be revealed by examination of the blood chemistry, but in doubtful cases bone biopsy may be needed. Osteomalacia, hyperparathyroidism, uraemic osteodystrophy and malignant disease of bone such as myeloma must be excluded. In osteoporosis the rarefaction of bone is usually most evident in the axial skeleton, but the peripheral bones may also be affected. Barnett and Nordin (1960) suggested that the condition might be divided into two types—peripheral and central—but this suggestion awaits more certain proof. Moreover, although individual bones may show diffuse rarefaction, in more severe cases there is often a patchy character of bone change with radiographic evidence of lacunae.

STUDIES OF THE CAUSE OF OSTEOPOROSIS

Albright and Reifstein (1948) in developing biochemical methods for the assessment of patients with bone disease were unable to find in osteoporosis any disorder of calcium and phosphorus metabolism, and suggested that the disease depended on defective growth of bone matrix. With the development of tracer methods it has become possible to check this hypothesis; and several observers have obtained results which do not seem to confirm it (Fig. 9). Closer scrutiny is showing that the interpretation of data gained by tracer methods is also difficult and may not yet be final. Such tracer observations have reopened the original hypothesis of calcium deficiency as the cause of osteoporosis (Pommer 1925, Nordin 1960). Meanwhile the treatment of osteoporosis has remained a problem (Henneman and Wallach 1957) whether by androgens and oestrogens as suggested by Albright and Reifstein (1948), or by calcium supplements; and it is even more difficult to assess the efficacy of these treatments. For such an assessment we need to be able to measure bone density by radiographic methods and so to demonstrate reformation of bone during the period of treatment. Some methods of radiological assessment of bone density have now been evolved (Doyle 1961) so that we can expect a more careful appraisal of the various methods of treatment of osteoporosis.