

## Osteoporosis—A Worldwide Problem and the Implications in Asia

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Osteoporosis is a condition characterised by low bone mineral density, microarchitectural deterioration of bony tissue, and a consequent increase in fracture risk.<sup>1</sup> With rapid ageing of the Asian population, osteoporosis has become one of the most prevalent and costly health problems. The public health impact of osteoporosis stems from its association with fractures of the hip, spine and forearm. Between 10% and 20% of patients sustaining a hip fracture die within a year of the event, and among those who survive, almost two-thirds remain disabled.<sup>2</sup> The medical costs of osteoporosis and its attendant fractures have been placed at \$5.2 billion each year in the US<sup>3</sup> and £615 million each year in the UK.<sup>4</sup> The cost of treating hip fractures in Hong Kong exceeds 1% of the total hospital budget. It has been projected that this cost will rise exponentially as the population ages.

In the 1960s, there were pronounced geographical variations in hip fracture incidence, with rates being much higher in Caucasians living in Northern Europe and North America than in Asian and Negroid populations. In the 1960s, the age-adjusted incidence of hip fracture in Hong Kong Chinese was approximately 13% to 30% of that observed in Caucasians.<sup>5</sup> However, with socio-economic development in many Asian countries, the incidence of hip fractures has risen considerably. For instance, the incidence of hip fractures in Hong Kong Chinese increased by more than 2-fold in the last 2 decades.<sup>6</sup> In Singapore, the incidence of hip fracture increased from 7 per 10,000 in women who were 60 years of age and older in 1957<sup>7</sup> to 15 per 10,000 in 1985.<sup>8</sup>

The results of the Asian Osteoporosis Study, which is the first multi-centre epidemiological study conducted in Asia, confirmed that the hip fracture incidence rates in Hong Kong and Singapore were approaching those observed in American Caucasians.<sup>9</sup> Although the rates in Malaysia and Thailand were much lower, these are likely to increase with urbanisation and ageing.

According to projections by the World Health Organization, there will be a total of 900 million men and women who are 65 years of age and older in Asia by the

year 2050. As a result, while only 30% of all hip fractures in the world occurred in Asia in 1990, more than 50% of all hip fractures will occur in this continent by the year 2050. By then, the total number of subjects with hip fracture in Asia will be approximately 3.2 million per year.<sup>10</sup> There is no doubt that primary preventive strategies for osteoporosis should be implemented in Asia. However, more challenging issues include rationing of bone mineral density measurements and finding the money to treat osteoporosis.

The results of the Asian Osteoporosis Study suggested that many lifestyle factors might be associated with osteoporosis.<sup>11</sup> To name a few, these include a low dietary calcium intake, a sedentary lifestyle, cigarette smoking and alcoholism. There is no doubt that public health policies should address these issues. What is more doubtful is the extent to which individuals within populations can be persuaded to change their behaviour, and to sustain such changes.

To prevent fractures, the 'case-finding' approach has to be adopted i.e. subjects at high risk of fractures should be identified and treated. Osteoporosis is a silent condition, and in the absence of a fragility fracture, is diagnosed by measuring bone mineral density (BMD), using dual energy X-ray absorptiometry (DXA). BMD is performed when the diagnosis of osteoporosis is in doubt or when it would affect patients' compliance or decision to undertake treatment. The elderly with fractures and multiple risk factors may not require scanning for initiating drug treatment, but BMD measurements may be useful to encourage a patient to remain on relatively expensive medications. Apart from women over 65 years old, the group which would benefit most from a scan are those under 65 years old who have multiple risk factors, such as a history of fracture, cigarette smoking and family history of fractures. Because of the high cost and relative scarcity of BMD measurements, health authorities in Asia would have to develop clear and effective strategies to ration the use of DXA.

Several drugs have been found to be useful for the prevention of fractures. Alendronate is effective in

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preventing most types of fragility fractures,<sup>12</sup> while the selective oestrogen receptor modulators (SERM) have been found to be effective in preventing vertebral fractures.<sup>13</sup> The traditionally used hormone replacement therapy (HRT) is not usually preferred by Asian women. Moreover, recent evidence seems to indicate that HRT might not benefit the cardiovascular system in postmenopausal women.<sup>14</sup> Based on drug efficacy, it is relatively easy for governments and doctors to decide on the choice of therapy, but it is harder to find the resources to finance such treatment. Few of the drugs for treating osteoporosis are cheap, and parameters of cost, such as the total sum required to treat more than 10% of the population lifelong, can be easily deduced. It is doubtful if many countries in Asia can sustain such costs. There is no easy solution to the epidemic of osteoporosis, without solving the basic problem of financing health care for ageing populations in Asia.

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