Overview

Osteoporosis and its related fractures is a major health problem in Hong Kong. Epidemiological studies found that the incidence of hip fracture had increased by 300% from the 1960’s to the 1990’s. In 2006, the incidence of hip fracture was 379/100 000 among women who are 50 years and over and 169/100 000 in men. Interestingly in Hong Kong, the incidence of hip fracture had ceased to increase from 2001 to 2006 in women. The reasons for the secular decline in hip fracture incidence are unknown but some reasons are postulated below. Vertebral fracture is also a major public health problem in Hong Kong with prevalence at 30% among women and 16% among men. Even with this stabilisation of hip fracture rates, osteoporosis will continue to have a major impact on the quality of life of older men and women in Hong Kong and continue to be a major burden on health services and society.

Key findings

The total population in Hong Kong is approximately 7 million. Of this, 22.5% (1.58 million) is 55 years and over (2009 estimated) (figure 1).

With the ageing of the Hong Kong population, osteoporosis has become one of the most prevalent conditions that is associated with a great medical and socioeconomic burden. The public health impact of osteoporosis stems from its association with fractures of the hip, spine and forearm. Ten to twenty percent of hip fracture patients die within a year of the event, and of those who survive, almost two-thirds remain disabled¹. In Hong Kong, a highly urbanized city, the incidence of hip fracture had increased by 300% in women and 200% in men in the last 3 decades (table 1)².

Table 1 Incidence of hip fracture in Hong Kong (rate per 100 000 population)

<table>
<thead>
<tr>
<th>Year</th>
<th>Women</th>
<th>Men</th>
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<tbody>
<tr>
<td>1966</td>
<td>70</td>
<td>48</td>
</tr>
<tr>
<td>1985</td>
<td>273</td>
<td>113</td>
</tr>
<tr>
<td>2001</td>
<td>394</td>
<td>159</td>
</tr>
<tr>
<td>2006</td>
<td>379</td>
<td>169</td>
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The projected number of hip fractures in Hong Kong in future can be calculated by applying the current age-specific rates to the future population of Hong Kong. Assuming no increase in age-specific rates, the total number of hip fractures in the year 2015 will be 5293 and 2349 in Hong Kong women and men respectively (total of 7642).

Prevalence of vertebral fracture

According to radiographic studies, 19-26% of postmenopausal women have a vertebral deformity. Vertebral fractures are as frequent in Asians as in Caucasian women.

The prevalence of vertebral fracture (based on a definition of vertebral height ratio reduction by 3 standard deviations or more) has been found to be 30% in Hong Kong women and 17% in Hong Kong men.
who were 70-79 years old. These rates are much higher than those in Taiwan and Mainland China, and are comparable to those in American Caucasians.

The medical cost of osteoporosis and its attendant fractures have been placed at 5.2 billion USD each year in the US and 1 billion USD each year in the UK. The majority of direct cost (95%) was incurred by hospitalized patients, due to hospital and rehabilitation expenses. In Hong Kong, the total cost for the treatment of hip fractures was 19 million USD in 1995. According to the report of the Hospital Authority in 1996, the acute hospital care cost of hip fractures amounted to 1% of the total annual hospital budget, or 17 million USD, for a population of 6 million.

However, fracture trends in many western industrialized countries suggest that hip fracture rates appear to rise rapidly (possibly coincident with the early stages of economic development) then stabilise and eventually decline. It is possible that hip fracture rates in Hong Kong and Singapore may also be starting to stabilise. After the steep rise in incidence rates up to 1985, a later study shows that between 1985 and 1995 fracture rates in Hong Kong began to level off. A recent study analysed the trends in hip fracture rates in Hong Kong between 1995 and 2004 in order to predict the impact on future public health services in Hong Kong. Figure 2 shows the number of hip fractures in men and women of 50 years and more from 1995 to 2004. With the increasing size of the older population, a rising trend is observed in the number of hip fracture rates in Hong Kong, especially among women. However, age-specific hip fracture rates in men and women demonstrate that the incidence rates of all groups had declined with the most marked decrease seen in the 50-59 age group (figure 3-6).
Over the past 10 years in Hong Kong there has been a decline in fracture rates in men and women aged 50 years and above. The reasons for this are unclear but there are various possibilities:

- There has been improved availability of medical intervention to prevent osteoporosis. Bisphosphonates were made available to the general public in 1995, and to all hospitals by the Hong Kong Hospital Authority two years later. Unfortunately, there is no good information on the use of anti-osteoporosis agents to determine the magnitude of their impact on fracture reduction in Hong Kong.

- The effect of ecological changes such as an increase in body mass index.

- Since 1994 there has been increased medical attention to menopause and hormone replacement therapy (HRT) as well as increased media attention. A study carried out by Tang et al. in the 1990s shows that before 1994, the use of HRT in Hong Kong women was estimated to be around 2–3% of menopausal women. The study also revealed that there was lack of knowledge amongst the general public regarding menopause and its health consequences. Since then, public health activities on promotion of women’s health were launched and guidelines have been issued on the prescription of HRT for Asian women as there is evidence that menopausal symptoms may vary considerably when comparing Asian women with their western counterparts. These actions may have helped to increase the awareness of postmenopausal women and the usage of HRT in Hong Kong.

- Improved community awareness in the prevention of falls. Fall prevention is a major focus of the programs of the Community Geriatric Assessment Teams and it is likely that reduction in falls would contribute significantly to the decline in hip fracture incidence.

The changing rates of hip fracture among older women and men may reflect the effects of modifications of risk factors, including physical inactivity, vitamin D insufficiency and the increasing risk of falling at a given age due to increasing frailty. Rather less likely to contribute are changes in body build, changes in nutritional pattern, changes in consumption of tobacco and alcohol, the use of post menopausal oestrogen and the more widespread risk assessment using DXA and pharmacotherapy. However, no single explanation appears to account for the different patterns seen among men and women, nor the timing of rising rates among women in different regions. Looking at attributable proportion of fractures that might be impacted by the uptake rates in the population of pharmacotherapy, these are really very small at the present time.

The pattern seen in Hong Kong and Singapore over the past 40 years may well apply to other developing Asian countries and give rise to public health care issues. Future work will focus on the impact that preventive measures are having on fracture incidence and whether the downward trend in incidence is likely to be continued. Epidemiological studies will need to be carried out in other Asian countries to help predict the impact on their own public health services.

In the past decade, there has been a growing awareness of osteoporosis as a major health problem both in the public community and medical profession. The Department of Health of the Hong Kong Government has incorporated educational programmes on osteoporosis in their outreach geriatric program, women’s health program, and primary school health education program. These programs cover epidemiology, cause and prevention of the disease. Among the medical profession, structured programs are established by the various Colleges of the Hong Kong Academy of Medicine including the Hong Kong College of Physicians, Obstetrics and Gynaecologist, Orthopaedic Surgeons, for higher clinician training on osteoporosis. The Osteoporosis Society of Hong Kong (OSHK), a non-government organization formed by the medical profession in Hong Kong, works closely with the various Colleges to promote education, training and research in Osteoporosis. A Clinical Management Guideline was established by the OSHK to advise on the clinical practice for prevention and management of osteoporosis in Hong Kong. The Society also organizes annual scientific conference for clinicians, as well as Train-the-Trainer Workshops for para-medical and allied health professionals. The Hong Kong Osteoporosis Foundation (HKOF) was established in Hong Kong with a mission to promote public awareness on osteoporosis. It organizes activities and campaigns around World Osteoporosis Day to arouse
the awareness of the disease. Both OSHK and HKOF provide health education though their website, public lectures and information leaflets.

**Conclusion**

The Hong Kong Government encourages its people to take care of their own health and be responsible for primary prevention of public health diseases, including osteoporosis. Unfortunately, due to the limited health care budget of the government, there has actually been a slip-back in the support towards reimbursement of anti-osteoporosis agents. Health care professionals in Hong Kong are currently lobbying the government to address the issue of reimbursement policy for anti-osteoporosis agents.

In the light of recently published data, updated guideline recommendations have been produced for the assessment and treatment of osteoporosis in clinical practice.

As local data on cost-benefit profile of individual therapeutic agents is lacking, treatment of individual subjects should be assessed carefully as many of these patients will be elderly and life expectancy and coexisting medical conditions must be considered when recommending treatment. More local research is needed for cost-effectiveness of various treatment modalities as well as a common DXA diagnostic cut-off value for our local population.

**References**

2. Lau EM, Cooper C, Fung H, Lam D, Tsang KK. Hip fracture in Hong Kong over the last decade - a comparison with the UK. J Public Health Med, 1999; 21(3):249-250

Non governmental organizations in Hong Kong, and throughout Asia, carry out important work in raising public awareness of osteoporosis on World Osteoporosis Day.