Executive summary

Given the large elderly population in Asia, osteoporosis is and will be a major health problem in the coming years, and cost-effective means of identifying and treating patients at high risk of hip fracture are necessary. The incidence of hip fracture has risen already 2- to 3-fold in most Asian countries during the past 30 years.

The belief that osteoporosis is prevalent in the West and rare in the East is a myth. There is consistent evidence that epidemics of hip fracture occur with urbanization throughout Asia. A recent multi-national study conducted in four Asian countries revealed that the incidence of hip fracture has risen as economic development has unfolded. The adjusted rates in Hong Kong and Singapore were almost identical to those seen in American Caucasians (at 19 per 10,000), while the rates in Thailand and Malaysia were two-thirds and one-half, respectively, of the Hong Kong rate. In Hong Kong, the incidence of hip fracture had increased by 300% from the 1960s to the 1990s.

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>
</tr>
</thead>
<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>
</tr>
</tbody>
</table>

E. Lau, unpublished data

In Singapore, the incidence of hip fracture in 1998 was 5 times the incidence observed in the 1960s. From 1991 to 1998, the incidence of hip fracture increased by 0.7% annually in men and by 1.2% annually in women. In Japan where hip fracture was believed to be among the lowest in the world, the incidence of hip fracture increased by 1.6-fold in men and 1.5-fold in women from 1986 to 1998. The incidence of hip fracture in mainland China increased by 34% in women and 33% in men from 1988 to 1992 when it was one of the lowest in the world, at 10 per 10,000 in both men and women.

Studies in various countries have shown that the costs of osteoporosis are substantial. Hip fracture is a major cause of hospital admission in the elderly. The acute care cost associated with hip fracture is tremendous in all developed countries. In the US, the direct cost of hip fracture was approximately 13.8 billion USD in 1995. In the UK, the direct cost of hip fractures was £942 million per year in 1998. In Hong Kong, the acute hospital care cost of hip fracture in 2006 amounted to 1% of the total hospital budget (unpublished data). Given the high cost associated with osteoporosis and hip fracture, early detection and treatment of high risk patients are critical.

The above evidence confirms that hip fracture will be a major health challenge in Asia in the coming decades. However, in the West, the incidence of hip fracture is showing some signs of stabilization (Figure 1). Melton et al. reported a downturn in hip fracture incidence in Rochester, Minnesota, between 1984 and 1987. In Hong Kong, the incidence of hip fracture had ceased to increase from 2001 to 2006. The reasons for the secular decline in hip fracture incidence are unknown but could be due to socio-economical changes, such as an increase in body mass index, or because more patients with osteoporosis are being diagnosed and treated.

Figure 1 Secular trends in hip fracture worldwide

Clearly there is an urgent need to undertake large scale epidemiological studies in Asia.

References

2. Cyrus Cooper et al, 2009 European Congress on Clinical and Economic Aspects of Osteoporosis and Osteoarthritis
Key findings in Asia in 2009

Major increase in fractures predicted for Asia

- The incidence of hip fracture has already risen 2- to 3-fold in most Asian countries during the past 30 years.
- By 2050 more than 50% of all osteoporotic fractures will occur in Asia.
- The incidence of hip fracture has risen as economic development has unfolded in several Asian countries.
- The incidence of hip fracture in mainland China which was one of the lowest in the world in 1988, at 10 per 10 000 in both men and women, has risen markedly. Today 69.4 million Chinese over age 50 suffer from osteoporosis with 687 000 hip fractures each year.
- It is predicted that the number of Chinese with osteoporosis and osteopenia will increase to 286.6 million in 2020 and 533.3 in 2050.
- In Hong Kong the incidence of hip fracture had increased by 300% from the 1960s to the 1990s.
- It is estimated that by 2013, the number of people in India with osteoporosis will reach 36 million.
- In Singapore, the incidence of hip fracture in 1998 was 5 times the incidence observed in the 1960s.
- In Japan where hip fracture was believed to be among the lowest in the world, the incidence of hip fracture increased by 1.6-fold in men and 1.5-fold in women from 1986 to 1998.

Prevalence of osteoporosis and fractures severely underestimated

- The belief that osteoporosis is prevalent in Western countries and rare in Asia is a myth.
- Advancing age is a major risk factor for osteoporosis and fractures – and Asia is rapidly ageing. Each country in the region (except Japan) demonstrates an expanding and ageing population.
- Vertebral fractures are as common in Asians as in Caucasian populations, with very few vertebral fractures diagnosed.

Fractures represent a huge personal, social and economic burden in all countries

- In Thailand, mortality after hip fracture for women and men is 1 in 3, making it the sixth leading cause of death.
- 19-26% of post-menopausal women in China have a vertebral deformity.
- In Hong Kong, the acute hospital care cost of hip fracture in 2006 amounted to 1% of the total hospital budget (unpublished data).
- In China, the average length of hospital stay (19-24 nights) for a hip fracture exceeds that for treating breast cancer, ovarian cancer, prostate cancer or heart disease.
- In India, as possibly in other countries in the region, only a minority of people have private or government health insurance to cover hospitalization costs following hip fracture. This implies that many hip fracture sufferers must pay out of pocket at great personal cost or remain untreated.

DXA technology is not widely accessible

- DXA technology, considered the gold standard for measurement of bone mineral density,
is relatively expensive and not widely available or easily accessible in most developing Asian countries.

- In most countries the limited number of DXA machines are available primarily in urban areas.
- In areas without reimbursement, the cost of DXA is often prohibitively high for the average wage earner.

**Widespread vitamin D deficiency and low calcium intake**

- Vitamin D deficiency is prevalent throughout the 14 countries involved in the Audit, particularly in South and South East Asia.
- Adequate calcium, whether through food or supplementation, is an important way to maintain bone health. Nearly all Asian countries outlined in this Audit report are far below the FAO/WHO recommendations for calcium intake ranging from 1000-1300 mg/day for adults. The average dietary calcium intake for the adult Asian population is approximately 450 mg/day.
- Rickets (a childhood disease causing deformity due to ‘soft bones’) appears to be common in China (40°N) – probably the result of poor vitamin D status and low calcium intake.

**Osteoporosis is a neglected disease**

- Osteoporosis is greatly under diagnosed and under treated in this region, even in the most high risk patients who have already fractured.
- The under recognition of osteoporosis is mainly due to a lack of structured government sponsored awareness programs for both physicians and the public.
- Health professional awareness is not optimal given the extent of the problem. In China, for example, osteoporosis prevention and treatment is not included in medical college education. Training is carried out by academic societies with the approval of the Ministry of Health.
- In several countries, including China, there are as yet no official government approved national guidelines on osteoporosis diagnosis and treatment.
- In several countries, lack of solid epidemiological and economic data is a major hindrance in convincing health authorities about the importance of osteoporosis.
- In many countries, osteoporosis competes with other serious health issues for scarce health care resources.

- There is lack of funding to support professional training and public education programs.

**A great rural and urban divide**

- In the most populous countries like China and India, the majority of the population lives in rural areas (60% in China), where hip fractures are often treated conservatively at home instead of surgical treatment in hospitals.
- At present, most treatments, prevention and education efforts are limited to cities, whereas people in rural areas have little knowledge about this disease.
- In all countries (and especially in widely dispersed countries such as Indonesia) access to diagnostic testing or treatment in rural areas poses a particular challenge.

**Some positive trends**

Despite the formidable deficits and challenges still facing osteoporosis prevention and management in Asia, there has been a trend towards:

- Governments beginning to recognize osteoporosis as a major health problem (4 of 11 giving feedback)
- A decade ago only 6 osteoporosis-related non governmental societies in Asia were members of the International Osteoporosis Foundation, today it is 28. As shown in this report, these societies are doing admirable work in public and health professional education, publishing and disseminating medical guidelines, and carrying out important research.
- Successful education and awareness initiatives are being co-organized by non profit organizations with industry support.