Orthopaedic Problems in the Elderly

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Introduction

Through the last quarter century, and particularly in the last 10 years, Malaysia has seen a gradual upward trend in the health status of the population, as evidenced by the improvement in various health indices, some of which are comparable to those in more developed countries like Japan, Taiwan and South Korea in our half of the globe. The average life expectancy at birth in 1995 for a Malaysian male was 69.3 years and that for a female was 74.0 years, and this upward trend is obviously an important indicator of the level of progress and development in our country and a reflection of improved health care, economic status and lifestyle habits. Nevertheless, there is still much scope and need to improve on these indices before achieving the status of a fully developed country.

Obviously, the higher life expectancy brings with it, not only a changing pattern in diseases which may be labelled "old-age diseases", but the increasing need for total care of the aged in our community raises, besides health care, various economic, social, psychological and community related issues.

The orthopaedic problems related to longevity and an ageing population are closely tied up with problems of chronic illnesses, dementia, malignant tumours and cardiopulmonary diseases, which inevitably and invariably influence the management strategy, outcome, morbidity and mortality of such patients.

Quite often, definitive, surgical treatment of old age patients with musculoskeletal diseases or trauma needs to be modified, delayed, or at times even abandoned because of the high risk involved in subjecting them to anaesthesia and surgery. The main objective in the definitive treatment of old age patients has always been to get them out of bed and ambulating, if need be with aid; out of hospital and back to their home and community environment, as quickly as possible.

The three major diseases, all of them generally preventable through various prophylactic, therapeutic and awareness measures, which would merit consideration in this discussion of geriatric orthopaedic problems are: osteoporosis, fractures and degenerative joint diseases.

Osteoporosis

Osteoporosis which develops hand in hand with the ageing process is purposefully referred to as the silent epidemic. Figures of incidence in the Malaysian population is not available, but in the US it is estimated to affect some 20 million people.

The post-menopausal (Type I), or the osteoclast-mediated osteoporosis, is characterised by rapid bone loss and presents in the recently post-menopausal woman, and affects females six times more frequently than the males. The rapid phase of bone loss predominantly involves trabecular bone, and is associated with vertebral, distal radial and proximal femoral fractures.

Senile (Type II) or osteoblast-mediated osteoporosis affects females twice as frequently as males, and is related to ageing, chronic calcium deficiency, increased parathyroid activity and diminished bone formation.

Post-menopausal osteoporosis is seen in Malaysia quite frequently in ladies presenting with mid-dorsal and lumbar back pain, within five to ten years after menopause, usually of insidious onset, often without radiological evidence of macro-fractures involving these vertebrae, but with varying degrees of trabecular bone

loss. Its apparent high frequency is probably related to the petite, small skeletal frame and the mainly sedentary life styles of Malaysian women, an impression that would need scientific statistical substantiation.

The methods of measuring bone mineral density has seen much development, and are useful as a yardstick for treating osteoporosis, preventing fractures and for monitoring the response to hormone replacement therapy. Radiographic methods using proximal femur and hand bones, have been replaced by single beam densitometry, and quantitative computer-tomography scanning, to dual energy X-ray absorptiometry (commonly called DEXA) which has a high degree of precision[1].

The primary goal in the treatment of osteoporosis is to prevent bone loss beyond the fracture threshold, and prophylactic treatment with anabolic steroids, calcitonin, and calcium and Vitamin D3 supplements are now available.

Fractures of the Spine

Fractures in the elderly, occurring with trivial trauma, often have an osteoporosis aetiology. Compression fractures of the mid-dorsal and dorso-lumbar spine are seen in elderly patients following minor domestic accidents in which they land on their buttocks or as a spontaneous event. Multiple compression fractures in the same patient are not uncommon, and previous anterior compression fractures may cause thoracic kyphosis (dowager's hump) and in the lumbar spine there may be loss of lumbar lordosis. The axial height may be reduced.

Pain and discomfort in walking and standing with mild lower limb pain radiation are the usual presenting complaints in osteoporotic spinal fractures. When spinal cord or cauda equina involvement is present, other conditions like metastatic tumour, myeloma or lymphoma or expansile primary tumours should be considered in the elderly patient.

Osteoporotic compression fractures of the spine heal quickly regardless of treatment. The goals of therapy are to relieve pain, and to provide mechanical support for the spine, physical therapy and rehabilitation programmes in the acute stage, and then continued physical and moral support along with calcium and vitamin D supplements, calcitonin and anabolic steroid injections.

Fractures of the Proximal Femur

World-wide prevalence of fractures of the proximal femur is increasing as the average age of the population increases, and in Malaysia we see a fair share of these troublesome fractures. These fractures are expected to triple in incidence by the middle of the next century, and pose a frightening economic burden for the country. In the United States 250,000 fractures of the proximal femur are treated each year, with an annual health care cost of more than US$8.7 billion.

The incidence of proximal femoral fractures in Malaysia is not known. Singapore and Hong Kong, with predominantly ethnic Chinese population, have incidences per 100,000 population, of 20 and 31 respectively[4,5].

Some interesting facts on the ethnic incidence of proximal femoral fractures have emerged. The incidence is low in black South Africans (5.6 per 100,000) and in African-Americans[3].

In an 1988 study, based on hospital admission, on 118 patients at Hospital KL, we found a high Chinese incidence (53%), as well as a disproportionately high incidence in Indians (40%) but a very low incidence in ethnic Malays. This low incidence could probably be linked to a high calcium intake in the Malay diet, coupled with abstinence from alcohol and a basically *kampong* lifestyle of the elderly Malay[6].

There has been little argument in the treatment of trochanteric fractures which, in the medically fit patients, are routinely internally fixed, with excellent results and early weight-bearing ambulation. What has evolved through the years is the type of implant used, from simple pins, to pin-and-plates to the present-day dynamic compression screws stabilised with dynamic compression femoral stem plates.

In the treatment of femoral neck or intracapsular fractures, the higher rate of complications with

prosthetic replacement of the head of femur, like dislocations (0.3 to 11%), infections (2-42%) and six-month post-operative mortality (14-39%), have prompted a shift towards internal fixation[7]. An accepted protocol at present promotes immediate reduction and internal fixation with pins or screws in the patients below 65 years of age, and without chronic illness. For those patients between 65 and 75 years of age, with high functional demand and good bone density, internal fixation is similarly recommended.

Patients above 75 years of age should have prosthetic femoral head replacements. It is also suggested that patients at any age with chronic illness or limited life expectancy should have unipolar replacement, while those under 75 years of age with chronic disease but expected to live longer than one year should be managed with bipolar replacement[8].

In Malaysia, there is a tendency to replace the head of femur with a prosthesis irrespective of age and grade of femoral neck fracture, and this should be reevaluated particularly in suitable selected patients below 70 years in whom reduction and screw fixation may be a sound alternative.

Incidentally, our study on age distribution of patients with proximal femoral fractures revealed 70% (86 out of 124) were in the 61-80 years group, with nearly 50% (55 out of 124) in the 71-80 age group. Females predominated in both the femoral neck and trochanteric fractures.

Other Fractures

Fractures of the distal radius, proximal humerus (sometimes with dislocation of the shoulder joint) and distal femur occur with moderately heavy trauma, and are normally treated non-surgically, though rarely internal fixation may be warranted.

Degenerative Joint Disease

The knee is the most frequently affected synovial joint in age-related degenerative joint disease, followed by the hip and facet joints of the cervical and lumbar spine and there appears to be no significant ethnic differences in the Malaysian population. Shoulder, elbow, ankle and digital osteoarthritides are less common in the Malaysian population compared with the West.

Osteoarthritis (OA) of the medial compartment of the knee is common, although isolated patello-femoral involvement is also seen in the 40-50 age group. Progressive genu varus deformity is the initial invariable outcome, with associated collateral ligament incompetence. The delay in patients seeking medical attention in the early stages leads ultimately to tri-compartmental osteoarthritis in the elderly patient, with marked instability and severe ambulatory disability and pain.

Age-related osteoarthritis of the hip joint is a less common affliction in all the major races in Malaysia, from an impression gained from clinic attendance, compared with Caucasian whites.

Degenerative intervertebral disc disease, with facet joint spondylosis, leading to secondary central and lateral canal stenoses and secondary spondylolisthesis, is a major back problem in the elderly, compounded with the vertebral osteoporosis, often with collapse. There are inevitable radicular symptoms, which incapacitate these patients.

The medical treatment of osteoarthritis continues to be a challenge to the clinician. The use of anti-inflammatory agents in OA is often questioned, particularly when the disease is primarily cartilage-bone involvement with minimal synovial reaction, coupled with evidence that some of the agents may further damage articular cartilage. Compounding these inherent problems are the side-effects of NSAIDs on the gastric mucosa and more recent evidence on the adverse effects on the small intestines.

The age-old first-line management of these elderly patients with orthoses, physical therapy and analgesic support, with moderation of activity, while providing some useful benefit, generally leaves the patients house-bound and demented. The sedentary life induces obesity, with further cardio-pulmonary-renal compromise.

The invasive treatment of osteoarthritis of small and

big joints runs a wide spectrum: from simple soft tissue operations (correction of contractures, ligament and capsular realignment procedures) through joint debridement (arthroscopic or open), excision of osteophytes, excision arthroplasty, silastic interposition arthroplasty, extra-articular realignment osteotomy, arthrodesis and finally total joint prosthetic replacement. Many of these operations are being carried out, some as primary and others as salvage procedures.

Realignment osteotomy around the knee in the uni-compartmental stage of osteoarthritis has stood the test of time, and in our country as in others in the region, it is accepted more readily than total joint replacement, which is also becoming increasingly expensive.

The total prosthetic replacement for osteoarthritis of major joints, and their short comings and complications, continue to fill the pages of most orthopaedic journals. Despite continuing technical evaluation and innovation, and the widespread use of total joint replacement since the 1960s, the search for an enduring prosthetic replacement continues unabated.

The observation in 1892 of Walt Whitman, an American poet, that "the narrowest hinge in my hand puts to scorn all machinery". remains unchallenged despite the remarkable advances in joint replacement, and no current prosthesis comes close to providing an effective duplicate of the biological and mechanical function of articular cartilage and the function and durability of synovial joints. Nevertheless, many of the currently available joint replacement devices do provide a treatment of choice for elderly patients who are not expected to outlive the implant.

Future research and genetic bio engineering may provide some answers for preservation and regeneration of hyaline articular cartilage, whose level of performance has never been even marginally equalled by any known synthetic material at this point in time.

Total knee replacement is being increasingly carried out in our country, and it would be useful to see publications from orthopaedic surgeons on the outcome. There seems to be less need for total hip replacement in our patients. These replacements are being carried out in various centres around the country for rheumatoid disease and osteoauthritis in the elderly patients.

Other Conditions

Numerous malignant tumours arise in the elderly, and in any old age patient presenting with musculo-skeletal pain in the spine, chest wall, humerus and lower limbs, the possibility of metastatic disease should be kept in mind, and the diagnosis of senile or post-menopausal osteoporosis should be by exclusion.

Pathological fractures in the elderly should be generally internally fixed with the objectives of pain-relief and rehabilitation and ambulation with support.

Deep vein thrombosis and pulmonary embolism in the elderly were always serious complications following surgery in the West, but usually considered rare in the Asian patients. However, a recent study in the Orthopaedic Department in University Hospital in Kuala Lumpur has revealed that the condition does exist to some extent in our patients.

Primary Care of the Elderly

No discussion of the orthopaedic problems, or for that matter any other surgical or medical problems in the elderly can be complete without reference to the need for enlightened primary care of these patients. Primary care physicians need to be trained adequately in recognising geriatric conditions and in managing such patients in the primary care setting, which would include the home.

There is a need for rehabilitation hospitals throughout the country for the management of elderly patients discharged from hospitals, as post-operative care of such patients takes much longer and is more specialised compared with fit young individuals. With such centres, acute hospital beds may be made available for those who need emergency care.

Conclusion

Orthopaedics was defined as a disease of vertebrates,

and the word was synthesised by Nicholas Andre from Greek for straight (*orthos*) and child (*pais*), signifying that the discipline was evolved to correct skeletal deformities in children. With most children's orthopaedic problems becoming less frequent and the increasing orthopaedic diseases in the ageing population, perhaps there is some justification for the speciality to be renamed "orthogerantis" (Greek for old age being *geras*).

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