Eur Spine J (2003) 12 (Suppl. 2) : S81–S83
DOI 10.1007/s00586-003-0592-1

EDITORIAL

Marek Szpalski
Robert Gunzburg
Christian Mélot
Max Aebi

The aging of the population: a growing concern for spine care in the twenty-first century

Published online: 3 September 2003
© Springer-Verlag 2003

M. Szpalski (✉)
Dept. of Orthopaedics, HIS/C.H.
Molière Longchamp, Brussels, Belgium
e-mail: mszp@win.be

R. Gunzburg
Dept. of Orthopaedics, Euwfeestkliniek,
Antwerp, Belgium

C. Mélot
Intensive Care Unit,
Erasme University Hospital,
Brussels, Belgium

M. Aebi
Maurice E. Müller Institute
for Evaluative Research and Documentation
in Orthopaedic Surgery,
Murtenstr. 35, 3008 Bern, Switzerland

The aging of the population in industrialized countries appears to be a non-reversible phenomenon. Increase in life expectancy, due in great part to the improvement of healthcare, combined with a drastic decrease in birth rates has led to this situation. The world demographic situation has shifted from a pattern of high birth rates and high mortality rates to one of low birth rates and delayed mortality [10].

In Europe, the proportion of subjects over 65 was 10.8% in 1950, 14% in 1970, 19.1% in 1995 and is projected by some sources at 30.1% in 2025 and 42.2% in 2050. The proportion of subjects over 75 has grown from 2.7% in 1950 to 5.2% in 1995 and is projected at 9.1% in 2025 and 14.6% in 2050 [8]. These figures take into account the whole of Europe. When only western Europe is considered, the proportion of individuals over 65 should be over 50% in 2050. These numbers are just a little smaller in the USA [15]. However, this trend is not limited to industrialized countries: the developing countries' share of the world's population above 65 is projected to increase from 59% to 71% [10].

The global consequences of this distortion of the age pyramid on healthcare development, access and costs are huge [4]. In the USA approximately 80% of all individuals over 65 have at least one chronic condition and 50% have two [11]. Approximately 59% of US residents over 65 are affected by osteoarthritis, which is the main cause for disability [3].

All this results in a highly differential distribution of healthcare-related costs heavily skewed towards the elderly population. Costs per capita increase gradually up to the 55–64 age group, and then the costs increase very rapidly and explode after over 85 years [7]. Aging alone will generate an increase of more than 30% in real per capita healthcare expenditures by 2030 [7].

Back and neck pain are among the most frequently encountered complaints of older people and the nature of the spine renders those problems highly complex to investigate and to treat.

The spine is a very specific anatomic and functional unit. Whereas degenerative knee or hip changes visible at imaging will not be found in all elderly subjects, nearly all will exhibit spinal degeneration. Furthermore, few patients with severe gonarthrosis or coxarthrosis are symptom free, while many subjects with severe spinal degenerative images will be asymptomatic. This was demonstrated by several high-quality studies [1]. Furthermore, the existence of degenerative images on MRI of symptom-free subjects does not predict in any way subsequent complaints after several years [2]. The relation between the aging and

degenerative process and the possible complaints is far from clear. This in itself may begin to explain why the results of spinal surgery are so mitigated when compared to the excellent outcomes of knee or hip arthroplasty.

Degeneration of the spinal structures induces interactive alterations at many levels: bone, disc, facet joints, ligaments. Some of these degenerative lesions can be responsible for damage to the neural elements by leading to disc herniation or spinal stenosis.

The multifactorial nature of spinal degeneration, the complexity and multiplicity of treatment, the rapid evolution of medical technology and the nature of patient's expectations in terms of quality of life have also resulted in an escalation in costs.

The aging of the western population has increased the number of severely osteoporotic subjects, mostly women. Recent studies have shown that osteoporotic vertebral fractures are associated with an increased risk of mortality [9] and a decreased quality of life. The prevalence in those fractures is around 39% in subjects over 65 years [12, 13].

It does not appear that the preventive treatment strategies applied for the past few decades have yielded very spectacular results in the decrease of the frequency of osteoporotic fractures, including vertebral osteoporotic compression fractures. Whereas those lesions were long considered as a burden with which patients should live, there now exist percutaneous treatment modalities which not only deal with the problem of pain but also aim at restoring the compressed vertebral body height, thus trying to avoid possible kyphotic deformities. [14]. However, those treatments are expensive.

New techniques are also being developed to fight the degenerative process itself. Among those is gene therapy, which could provide a long-term delivery of molecules to retard or even revert degenerative processes. It appears to be a very promising path but, once again, a highly expensive one.

With the delayed mortality and better control of life-threatening chronic diseases the new challenge of care in elderly patients will focus on the preservation or restoration of the quality of life. That will be exactly what elderly subjects will demand and they will expect us to use all the available technological armamentum. New instruments measures such as the Disability Adjusted Life Years (DALY) or Quality Adjusted Life Years (QALY) [6,11] are being developed to try to evaluate this growing variable, and future spinal studies should look at the possibility of integrating them in the outcome assessment, even though they are not without shortcomings.

Although in cost-utility studies DALY's and QALY's have proved their usefulness to fill the gap between population health and medical care, inevitable differences will be seen in the outputs of their estimates of disease burden. Any different outputs may imply different priorities. One study that compared DALY's and QALY's as health-related quality of life weights, but keeping life-expectancy calculations identical, found differences in disease-burden estimates as well as changes in rank order of five common medical conditions [5]. These discrepancies remain a problem to be solved in the near future to allow payers a correct evaluation of the risk and the related costs before defining priorities in an era of budget constraints.

Spinal care in the elderly is, in fact, a very active and fascinating field that combines many different disciplines, from biomechanics to cell engineering. However, the major problem is that of resources. As the expenditures of health care continue to escalade worldwide, competition between medical disciplines for a share of the limited resources will also escalate.

Compared to treatment for cardiovascular disorders or diabetes, the treatment of spinal conditions does not appear to be such a priority. This is even more acute if one considers that there is a large consensus in the handling of these systemic chronic disorders based on high-quality scientific studies, whereas that consensus is painfully lacking in spinal disorders, for which high-quality studies are rare. The comparison with the treatment outcomes in hip and knee degeneration casts further doubt on the appropriateness of treatment of degenerative spine conditions.

The payers in the healthcare field such as governments and insurance companies will not follow forever the increase in costs of treatments for which physicians are not able to demonstrate efficacy through undisputable studies. It is we, spine specialists, who must make sure that we will have resources to meet the growing number of patients who will confront us in the coming years. Not only do we have to fulfill the expectations of the patients but also those of the financing parties. The only way to do this will be to demonstrate, much better than at present, that our expensive treatments are truly efficient and notably improve the duration and quality life of our older patients.

References

1. Boden SD, Davis DO, Dina TS, Patronas NJ, Wiesel SW (1990) Abnormal magnetic-resonance scans of the lumbar spine in asymptomatic subjects. A prospective investigation. Bone Joint Surg 72-A:403–408
2. Borenstein DG, O'Mara JW Jr, Boden SD et al (2001) The value of magnetic resonance imaging of the lumbar spine to predict low-back pain in asymptomatic subjects: a seven-year follow-up study. J Bone Joint Surg Am 83-A: 1306–11
3. CDC (2002) Prevalence of self reported arthritis or chronic joint symptoms among adults – US 2002. MMWR 51:948–950
4. CDC (2003) Public health and aging: trends in aging US and worldwide. MMWR 52:101–106

5. Gold MR, Muennig P (2002) Measure-dependent variation in burden of disease estimates: implication for policy. Med Care 40:260–266
6. Gold MR, Stevenson D, Fryback DG (2002) HALYS and QUALYS and DALYS, oh my: similarities and differences in summary measures of population health. Annu Rev Public Health 23:115–134
7. Hogan S, Hogan S (2002) How will the ageing of the population affect health care needs and costs in the foreseeable future? Commission on the Future of Health Care in Canada. Discussion Paper No. 25, October 2002
8. IIASA/ERD Database (2002) International Institute for Applied Systems Analysis, Laxenburg, Austria. www.iiasa.ac.at/Research/ERD/. Cited 27 April 2003
9. Kado DM, Browner WS, Palermo L et al (1999) Vertebral fractures and mortality in older women: a prospective study. Study of Osteporotic Fractures Research Group. Arch Int Med 159: 1215–1220
10. Kinsella K, Velkoff V (2001) US Census Bureau. An aging world. Washington DC. US Govt Printing Office, series P95/01–1
11. Mullahy J (2001) Live long, live well: quantifying the health of heterogeneous populations. Health Econ 10: 429–440
12. National Center for Chronic Disease Prevention and Health Promotion, CDC (1999) Chronic diseases notes and reports: special focus. Healthy Aging 12:3
13. Pluijm SM, Tromp AM, Smit JH, Deeg DJ, Lips P (2000) Consequences of vertebral deformities in older men and women. J Bone Miner Res 15:1564–1572
14. Szpalski M, Gunzburg R (eds) (2003) Vertebral osteoporotic compression fractures. Lippincott Williams & Wilkins, Philadelphia
15. United States Census 2000 (2000) US Census bureau, US Department of Commerce. www.census.gov. Cited 27 April 2003