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REVIEW

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The burden of musculoskeletal disease—a global perspective

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Abstract Musculoskeletal diseases are one of the major causes of disability around the world and have been a significant reason for the development of the Bone and Joint Decade. Rheumatoid arthritis, osteoarthritis and back pain are important causes of disability-adjusted-life years in both the developed and developing world. COPCORD studies in over 17 countries around the world have identified back and knee pain as common in the community and are likely to increase with the ageing population. Musculoskeletal conditions are an enormous cost to the community in economic terms, and these figures emphasise how governments need to invest in the future and look at ways of reducing the burden of musculoskeletal diseases by encouraging exercise and obesity prevention campaigns.

Keywords Burden of disease · DALYS · Musculosketal · Osteoarthritis

Musculoskeletal diseases are extremely common and have important consequences to the individual and society. They are one of the major causes of disease burden around the world and have been one of the significant drivers behind the development of the Bone and Joint Decade [1, 2]. The World Health Organisation (WHO) has reported the figures for burden due to musculoskeletal disease and shown that not only are they significant in terms of absolute disability-adjusted-life years (DALYs), but that this burden is seen (and is growing) in both the developed and developing world (Table 1).

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It must be remembered that these data do not include fractures as a result of osteoporosis, since these are currently classified under trauma. The addition of these numbers would add significantly and clearly demonstrate that the musculoskeletal diseases are one of the most significant causes of disability around the world. Of significance is the fact that a significant majority of this burden is in the developing countries and that this is likely to increase rapidly with the increasing longevity of these populations. Table 2 shows the percentage of burden attributed to the major rheumatic diseases—rheumatoid arthritis and osteoarthritis—broken down by gender and region. Rheumatic disease burden is seen more frequently in women, and osteoarthritis is the major cause of that burden. This time one can see how much of the burden of disease in developed countries is due to arthritis—nearly 3.5%.

These burden data should be used widely to impress on governments the importance of musculoskeletal disorders and why better recognition and support should be provided. Local country data (such as that from Australia) is important and can be used to persuade governments to recognise these conditions as was done in Australia in 2002 when arthritis and musculoskeletal disorders were added as the country's 7th national health priority [3]. This has led to the establishment of a National Arthritis and Musculoskeletal Disease Task Force with increased research and development funding and a specific grant of some $11 million to Arthritis Australia to develop exercise programs. These data, shown in Table 3, demonstrate how priorities may change when one compares mortality and morbidity data.

Although these numbers are impressive, there are still significant deficiencies in musculoskeletal burden of disease data, which need to be expanded in the next few years. Like other classical epidemiological studies, a large number of COPCORD (Community-Oriented Program for the Control of Rheumatic Diseases) studies in over 17 countries around the world have provided very useful data [5–9]. These community surveys have investigated musculoskeletal pain and specific rheumatic diseases in a

Table 1 Estimated burden of musculoskeletal conditions by region (2001)

Estimated burden of musculoskeletal diseases by gender and developed or developing regions, 2001					
Number of DALYS (thousands)	Total	Male	Female	Developing regions—both genders	Developed regions—both genders
Rheumatoid arthritis	4,757	1,353	3,404	3,238	1,520
Osteoarthritis	16,372	6,621	9,750	11,049	5,323
Other musculoskeletal diseases	8,699	5,033	3,638	6,789	1,880
All musculoskeletal diseases	29,798	13,007	16,792	21,076	8,723

number of rural and urban communities around the world. These surveys have shown that back and knee pain are common in these communities, while osteoarthritis (OA) and rheumatoid arthritis (RA) have a similar prevalence to the more formal epidemiological studies as shown in Table 4 [10].

One of the areas that is often not emphasised in musculoskeletal epidemiology studies is that of musculoskeletal pain. Telephone surveys and more formal epidemiological studies show it to be extremely common and increasing. A telephone survey of some 46,000 persons across 16 countries of Europe showed nearly 20% of adults suffering from chronic pain, that the most common source of pain was the back (24%) and that the most common cause was arthritis/osteoarthritis(35%) [11]. Prevalence of pain varied markedly between countries—with over 25% of adults from Norway, Poland and Italy reporting pain, while only 11% of adults in Spain suffered from chronic pain. A high proportion of sufferers indicated that they were not given adequate information about their pain and how they could manage it better. This emphasises the importance of developing better education programs for health professionals and patients and enhancing communication skills of musculoskeletal practitioners.

A similar telephone survey conducted in Sydney, Australia showed 22% of respondents affected with chronic pain (pain every day for the past 3 months) and musculoskeletal disease being the most common cause (26%) [12]. High utilisation of health services by those affected was noted in both surveys. Musculoskeletal pain seems significantly more common than it was 40 years ago, according to a recent study from the North West of England [13]. In this study, pain in the shoulder and back, and generalised musculoskeletal pain increased some two- to fourfold over a 40-year period. As practitioners of musculoskeletal medicine, we deem it important that we focus on this important and growing area of musculoskeletal disease [14].

Table 3 Mortality and mordibity burden data in Australia [4]

Mortality and morbidity burden in Australia			
Mortality burden (YLL)	Percentage	Disability burden (YLL)	Percentage
1. Ischemic heart disease	20.5	1. Depression	8.0
2. Stroke	8.3	2. Dementia	5.6
3. Lung cancer	6.3	3. Asthma	4.8
4. Suicide	5.2	4. Osteoarthritis	4.8
5. Colorectal cancer	4.4	5. Adult onset hearing loss	4.1
6. COPD	4.0	6. Diabetes mellitus[a]	3.8
7. Road traffic accident	3.3	7. Alcohol dependence/abuse	3.5
8. Breast cancer	2.8	8. COPD	3.3
9. Diabetes mellitus[a]	2.1	9. Stroke	3.3
10. Dementia	1.8	10. Ischmic heart disease	3.1

YLL Years lost to life, *COPD* chronic obstructive pulmonary disease (chronic bronchitis and emphysema)
[a]Includes type 1 and type 2 diabetes

Table 4 Rheumatic diseases (COPCORD)

Point Prevalence	India	Indonesia	China	Australia
RA	0.51	0.2	0.3	0.7
OA	5.8	5.1		8.2
Gout	0.1	1.7		1.5
Pain (%)				
Back	13.1	15.7	*N*	N
Knee	12.7	12.2	27	15
Shoulder	7.4	11	4.6	10

Table 2 Percent of total burden of disease due to OA/RA by gender and region

Estimated burden of musculoskeletal diseases by gender and developed or developing regions, 2001					
Percentage of total DALYS	Total	Male	Female	Developing regions—both genders	Developed regions—both genders
Rheumatoid arthritis	0.32	0.18	0.49	0.27	0.59
Osteoarthritis	1.12	0.86	1.39	0.91	2.05
Other musculoskeletal diseases	0.59	0.65	0.52	0.56	0.73
All musculoskeletal diseases	2.03	1.69	2.40	1.74	3.37

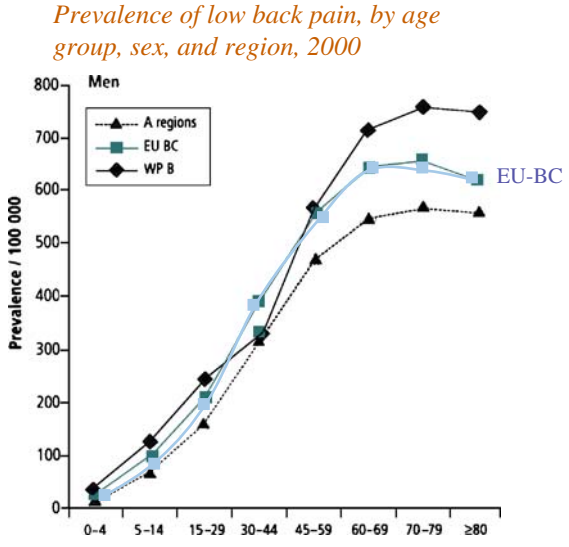

Fig. 1 Prevalence of low back pain by age group and region EU-BC—(developing countries in Europe)

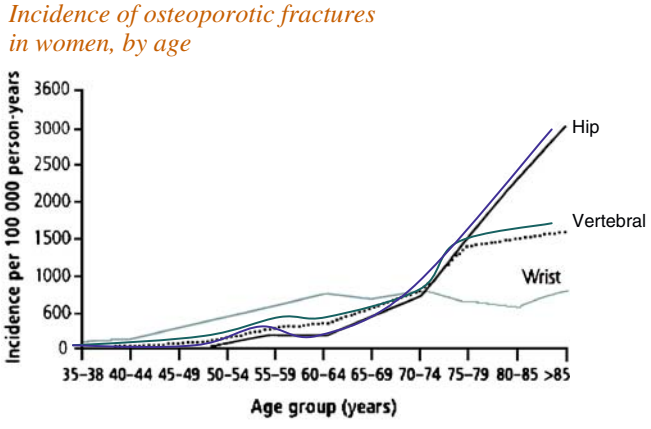

Fig. 2 Incidence of osteoporotic fractures in women, by age

Interesting data to support an association between musculoskeletal pain and obesity [15] and the well-known increasing prevalence of back pain with age (Fig. 1) all suggest that musculoskeletal pain will increase dramatically in the years to come.

The area of osteoporosis is another example of an "epidemic" of musculoskeletal disease burden. The incidence of osteoporotic fractures increases dramatically with age (Fig. 2) [16] and, with the ageing population, will increase some threefold by 2050, with almost 50% of those fractures occurring in China [17].

The ageing population and the increasing weight of individuals combined with lack of exercise will significantly influence these musculoskeletal burden statistics in the foreseeable future. We do have the ability to intervene on some of these issues, and this is where we need to direct our resources. Focussing on preventive strategies, such as weight reduction and exercise programs, will help to stabilise the increase due to age to some extent—but we need to act now. The costs of treatment of rheumatic disease are increasing, and by developing preventive intervention, we will be able to use our diminishing resources more effectively in the future. For example, total joint replacement is one of the most cost-effective operations available [18], and yet in many countries, patients cannot be treated in this way because of inability to pay or because of inadequate resources (human or otherwise). Data from our own group suggest that patients are well-satisfied with the outcome of both hip (100%) and knee (75%) replacement surgery even after 8 years with significant cost savings for-out-of pocket expenses (Fig. 3) as well as savings of $600 per year in medications [19].

As we move forward, there is an urgent requirement for better data on the burden of musculoskeletal diseases around the world. We must also continue to identify and modify risk factors for both primary and secondary prevention and further develop the research agenda.

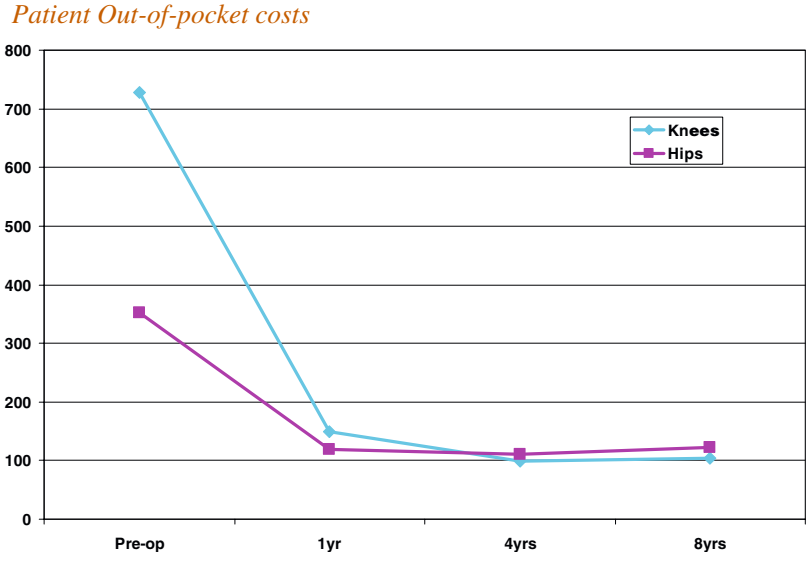

Fig. 3 Patient out-of-pocket expenses

The key themes to modern public health practice have been espoused as [20]:

1. Leadership of the entire health system
2. Collaborative actions across all sectors
3. Multidisciplinary approach to all determinants
4. Political engagement in public health policy
5. Partnerships with the population to be serviced

To do this properly, we do need to develop partnerships with other sectors—education, transport, labour and industry, to name but a few. These partnerships are going to be vital if we are to succeed in our goal to provide patient-"centred" health care in a health service that is both 'provider-friendly' and 'consumer-focussed'. Because of the multidisciplinary nature of the conditions we treat, musculoskeletal disease practitioners have a great opportunity to lead this interdisciplinary approach that we need to develop. The challenge is there for all of us—Let's rise to it.

References

1. Brooks PM (2004) Musculoskeletal medicine: the challenge of the Bone and Joint Decade. APLAR J Rheumatol 7:272–277
2. World Health Organisation (2003) The burden of musculoskeletal conditions at the start of the new millennium. (WHO Technical Report Series 919). World Health Organisation, Geneva
3. Hazes JA, Woolf AD (2000) The Bone and Joint Decade 2000–2010. J Rheumatol 27:1–3
4. Mathers CD, Vos ET, Stevenson CE, Begg SJ (2000) The Australian burden of disease study: measuring the loss of health from diseases, injuries and risk factors. Med J Aust 172: 592–596
5. Darmawan J, Valkenburg HA, Muirden KD, Wigley RD (1992) Epidemiology of the rheumatic diseases in rural and urban populations in Indonesia; a World Health organisation international league against rheumatism COPCORD study, stage 1, phase 2. Ann Rheum Dis 51:525–528
6. Manahan L, Caragay R, Muirden K.D Allander E, Valkenberg HA Wigley RD (1985) Rheumatic pain in a Philippine village. A WHO/COPCORD study. Rheumatol Int 5:149–153
7. Muirden KD (1997) The origins, evolution and future of COPCORD. APLAR J Rheumatol 1:44–48
8. Zeng QY, Chen R, Xiao ZY et al (2004) Low prevalence of knee and back pain in Southeast China; the Shantou COPCORD study. J Rheumatol 31:2439–2443
9. Chopra A, Saluja M, Patil J, Tandale H (2002) Pain and disability, perceptions and beliefs of a rural Indian population: A WHO-ILAR COPCORD study. J Rheumatol 29:614–621
10. Chopra A (2004) COPCORD—an unrecognised fountainhead of community rheumatology in developing countries. J Rheumatol 31:2320–2321
11. Fricker J (2003) Pain in Europe —a 2003' report. http://www.paineurope.com
12. Blyth FM, March LM, Cousins MJ (2003) Chronic pain-related disability and use of analgesia and health services in a Sydney community. Med J Aust 179:84–87
13. Harkness EF, Macfarlane GJ, Silman AJ, McBeth J (2005) Is musculoskeletal pain more common now than forty years ago?: two population- based cross-sectional studies. Rheumatology 44:890–895
14. Brooks PM (2005) Issues with chronic musculoskeletal pain. Rheumatology 44:831–833
15. Deltonen M, Lindross AK, Torgerson JS (2003) Musculoskeletal pain in the obese: a comparison with a general population and long term changes after conventional and surgical obesity treatment. Pain 104:549–557
16. O'Neil TW (2005) Looking back: developments in our understanding of the occurence, aetiology and prognosis of osteoporosis over the last 50 years. Rheumatology 44: (Supplement 4)33–35
17. Melton LJ (1995) Epidemiology of fractures: in Rigg BL and Melton LJ (Eds) Osteoporosis: Aetiology, diagnosis and management. Philadelphia, Lippincott Raven:225–247
18. Segal L, Day SE, Chapman AB, Osbourne RH (2003) Can we reduce disease burden from osteoarthritis—an evidence based priority setting model. Med J Aust 180:S11–S17
19. March LM, Lapsley HM, Cross MJ, Byrne E, Courtenay BG, Brooks PM (2005) Expenditure, outcomes and satisfaction 8 years after hip and knee replacement. Abstr. Australian Rheumatology Association annual scientific meeting, Melbourne
20. Muir-Gray JA (1999) Post modern medicine. Lancet 354:1550–1553