



# Osteoporosis

## Diagnosis and treatment in a general practice population

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### BACKGROUND

Osteoporosis may be underdiagnosed and undertreated. General practitioners are best placed to redress this.

### METHODS

The research group invited all GPs in Bendigo (Victoria) (60) to attend an educational evening about osteoporosis, and also to engage in subsequent research involving data extraction from their electronic medical records for 2003. Twenty-three GPs accepted the invitation to participate. The research group calculated the proportion of patients with osteoporosis recorded as a diagnosis in their medical record, and compared them with national prevalence estimates based on radiological diagnosis.

### RESULTS

The research group assessed 29 356 patient records of the 23 participating GPs, identifying 593 cases of osteoporosis. In patients aged over 59 years, osteoporosis was diagnosed in 12.6% of women and 3.8% of men. Of identified cases, 53.4% were prescribed antiresorptive drugs.

### DISCUSSION

The occurrence of a diagnosis of osteoporosis was well below radiologically estimated prevalence. Implementation of learning opportunities designed to improve GP recognition and treatment of osteoporosis could be beneficial. Electronic medical records can provide useful research data with privacy protected.

**Untreated, osteoporosis brings high social and economic costs to sufferers and their families.<sup>1-4</sup> According to estimates based on radiology of fractures<sup>5-7</sup> it is probably underdiagnosed and undertreated in Australia. A population study in Geelong (Victoria) using bone density scans suggested osteoporosis was present in 46% of women aged over 50 years and in 87% of those aged over 79 years.<sup>8</sup> Lifetime risk of osteoporotic fractures for Australians aged over 60 years is estimated at 29% for men and 56% for women, and at 27% and 44% respectively for those aged over 50 years.<sup>5,6,9,10</sup>**

In contrast to these radiological prevalence rates, only 12.5% of women and 2.5% of men aged 65 years or over self report a diagnosis of osteoporosis.<sup>11</sup>

Osteoporotic fractures are associated with increased morbidity and mortality.<sup>1,12</sup> Hip fractures reduce life expectancy by approximately 13 years for women and 8 years for men aged 60–69 years.<sup>12</sup>

Treatment with antiresorptive agents reduces the

subsequent fracture risk,<sup>9,13</sup> with bisphosphonates reducing both vertebral and nonvertebral fractures in patients with prior fractures,<sup>14</sup> and is recommended in Australian practice guidelines.<sup>15,16</sup> Australia's Pharmaceutical Benefits Scheme (PBS) subsidises prescriptions for these drugs for osteoporosis patients with radiological evidence of a minimal trauma fracture.<sup>17</sup>

Since vertebral and wrist fractures are likely to occur around 15 years earlier than hip fractures, early detection allows time for treatment to reduce the risk of the most disabling consequences of osteoporosis.<sup>9</sup> The Royal Australian College of General Practitioners (RACGP) guidelines recommend screening for osteoporosis in patients aged over 45 years with minimal trauma fractures.<sup>18</sup> General practitioners may be best placed to diagnose and treat osteoporosis, but frequently do not do so in patients with indicative fractures.<sup>19-24</sup>

The aim of this study was to identify the proportion of general practice patients who have had a diagnosis of osteoporosis made and recorded on their electronic

medical record, and of those, the proportion receiving antiresorptive drugs.

Monash University Committee on Ethics in Research Involving Humans approved the study.

## Methods

This research was initiated by one member of the research group with the Bendigo and District Division of General Practice, and Monash University School of Rural Health.

### General practitioner recruitment

General practitioners within the Bendigo Statistical District (60 total, 45 equivalent full time (EFT)) were invited by the division to an information session on the prevalence, diagnosis and treatment of osteoporosis, at which they were invited to join the study. Those GPs who did not attend the information session were sent material by post and all participating GPs returned a signed consent form. The division has applied for RACGP continuing professional development (CPD) points for participating GPs.<sup>25</sup>

### Data collection

De-identified data were collected from the electronic medical records for all patient contacts for the year 2003, protecting patient and practice privacy. Aggregating data by doctor, all active patient files for the year were tabulated by categories of age and sex. Within each category, the number of patients with a diagnosis of osteoporosis recorded in either the history or condition field was identified. The diagnosis may have been made by the participating GP or another doctor, and could have been recorded at any time prior to the end of 2003. Prescribed antiresorptive agents (specifically alendronate sodium, risedronate sodium, disodium etidronate and calcium carbonate, raloxifene hydrochloride and calcitriol) and the site of fracture (vertebral or nonvertebral) cited where a PBS prescription was authorised were also recorded. Treatments with only calcium or vitamin D were not included. Participating doctors received a copy of the tallies for their own patients.

### Analysis

Proportions of patients in each age and sex category with a diagnosis of osteoporosis,

and proportions prescribed antiresorptives, were calculated for each doctor and totalled for all doctors.

## Results

Of the 60 GPs (45.0 EFTs) invited to participate in the study, 23 (17.1 EFTs) from 10 practices participated, a response rate of 33% (38% EFT rate). Two participants were solo practitioners, and 21 were from group practices. Records for 29 356 patients (catchment population 68 500–76 000<sup>26</sup>) were searched. Three hundred and fifty-five records (1.2%) were excluded because of missing sex or date of birth data, leaving records for 13 037 males and 15 964 females.

A diagnosis of osteoporosis was recorded for 12.6% of women and 3.8% of men aged over 59 years. The proportion increased with age (Table 1). Fewer than 54% of diagnosed patients received prescriptions for antiresorptives.

In 72% of osteoporosis cases where antiresorptives were prescribed, the fracture

site was not recorded so proportions of fracture types could not be calculated.

## Discussion

This study has limitations. The low GP participation rate prevents confident extrapolation and the results were dependent on accurate recording by GPs. Analysis was limited by the low rate of recording of fracture details. Doctors had recorded diagnoses of osteoporosis at rates in line with previous studies but well below national estimated prevalence for women (Table 2). Even where doctors had noted established osteoporosis, they often did not prescribe medications known to reduce the risk of future fractures. This may be because patients were considered ineligible for the PBS authority due to absence of radiological evidence of a minimal trauma fracture, making other forms of treatment more appropriate. This issue warrants further research.

The identification of osteoporosis may not be a high priority, given the many demands on

**Table 1. Proportions of Bendigo general practice patients diagnosed and treated for osteoporosis, by age and sex**

	Age (years)	Total patients	Patients with osteoporosis diagnosis (%)	Osteoporosis patients with antiresorptives* prescriptions (%)
<b>Women</b>	<50	10 881	0.2	34.6
	50–59	1880	3.2	41.0
	60–69	1261	6.6	47.0
	70–79	1111	14.8	56.1
	>79	831	18.9	61.8
	(total >59)	(3203)	(12.6)	(56.4)
<b>Total women</b>		15 964	3.1	53.4
<b>Men</b>	<50	9167	0.1	100.0
	50–59	1578	0.8	25.0
	60–69	1032	1.6	62.5
	70–79	802	5.5	50.0
	>79	458	5.7	57.7
	(total >59)	(2292)	(3.8)	(54.7)
<b>Total men</b>		13 037	0.8	53.4
<b>Total patients</b>		29 001	2.0	53.4

\* Refers to alendronate sodium, risedronate sodium, disodium etidronate and calcium carbonate, raloxifene hydrochloride and calcitriol

**Table 2. Estimated prevalence of osteoporosis in Australian women\* compared to recorded diagnosis rates for women patients of Bendigo GPs**

Geelong osteoporosis study <sup>8</sup>		Bendigo osteoporosis study	
Age group (years)	Radiological prevalence estimates (%)	Age group (years)	General practice patients with diagnosis recorded (%)
50–54	9.4	–	–
55–59	18.2	50–59	3.2
60–64	37.9	–	–
65–69	55.6	60–69	6.6
70–79	72.7	70–79	14.8
>79	87	>79	18.9

\* Using bone mineral density data according to World Health Organisation (WHO) guidelines

the general practice consultation. However, the severe disability caused by hip fracture and the availability of treatment to reduce its risk following prior fractures suggests that the RACGP guidelines recommending investigation of patients aged over 45 years with low trauma fractures and postmenopausal women with suspected vertebral fractures should be widely adopted in general practice.

Although the study itself raised awareness of osteoporosis, feedback sessions with participants and the division suggested that further opportunities for GPs to learn more about risk factors, diagnosis and treatment could increase the identification rate. This study provides baseline measures against which the division can evaluate any strategy to address this issue.

We have demonstrated that study designs using electronic medical records can successfully address privacy and confidentiality concerns and suggest improved data recording will increase research opportunities.

## Implications for general practice

What we already know:

- Patients who have osteoporosis, discovered by vertebral or wrist fractures, could reduce their subsequent risk of hip fractures by using antiresorptive drugs.

What this study shows:

- General practitioners in Bendigo diagnosed osteoporosis at rates of about a quarter of the rate predicted by population radiological prevalence.
- Only 53% of diagnosed patients were

prescribed antiresorptive drugs.

- Electronic medical records can be useful for providing clinical research data in designs which protect confidentiality.

Conflict of interest: none declared.

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