Rowcroft Medical Centre in Stroud, pilot practice for the award winning Cotswold and Vale project

A primary care approach to managing patients at risk of osteoporotic fracture

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Following the article outlining the Central Manchester project in *Osteoporosis Review* 12.1, Jonathan Bayly and Geraldine Carter outline the award-winning work that has been carried out within Cotswold and Vale Primary Care Trust (PCT)

Identification of patients at risk of osteoporotic fracture and subsequent intervention in the case of such patients are likely to be more effective than merely targeting those with low bone mineral density (BMD). The recent data from the study of fractures (SOF) project have reminded us that less than half of fractures occur in patients with a BMD in the osteoporotic range.[1] The problem is in identifying those in a primary care situation with prevalent clinical risk factors that lead to an absolute fracture risk over and above that predicted by their BMD alone.

Table 1. Identified risk factors

Major

- Previous minimal trauma fracture
- Family history of osteoporosis (especially maternal fractured neck of femur)
- Systemic corticosteroid use
- Early hysterectomy or menopause before the age of 45 or other evidence of reduced lifetime exposure to oestrogen
- History of kyphosis or height loss >2″
- Low body mass index (BMI) <19
- Relevant disease associated with osteoporosis
- History of falls or falls risk

Minor

- Smoking in excess of five cigarettes/day
- Lack of exercise
- Dietary lack of calcium
- Excess alcohol

Table 2. Aspects of prescribing in 1,974 patients assessed for which data was submitted from practices representing 83% of the target population (n=59,538)

Patients on bisphosphonates (% of total assessed population)	348	17.6%
Patients on calcium preparations (% of total assessed population)	744	37.7%
Osteoporotics on bisphosphonates (% of all osteoporotics identified)	267	44.9%
Osteopenics on bisphosphonates (% of all osteopenics identified)	56	9.3%
Osteopenics on treatment with fracture (% of all osteopenics on treatment)	26	46.4%
Patients <65 on bisphosphonates (% of all patients on bisphosphonates)	28	1.4%
On bisphosphonates but not calcium (% of all patients on bisphosphonates)	106	30.5%

This pilot was based in Cotswold and Vale PCT. Patients were systematically identified and offered lifestyle and pharmacological interventions to minimise their risk of future fragility fracture. A previous countywide audit in Gloucestershire indicated low identified prevalence and intervention rates in patients thought to have osteoporosis.[2] Statistics available from the Directorate of Public Health indicated that the primary care organisation (PCO) in which the project was based had an excess of patients aged 65 years-plus, as well as a predicted growth in this age group likely to be double the national norm. The incidence of fractured neck of femur was far in excess of that in the comparator group. There was no systematic approach to identifying and managing patients at risk, nor was there significant dual energy X-ray absorptiometry (DXA) access at the start of the project.

A GP and a district nurse collaborated to develop a nurse-led programme

Methods

In response, a GP and a district nurse collaborated to develop a nurse-led programme within a single general practice based on Royal College of Physicians' (RCP) guidelines[3] and the NOS primary care strategy.[4] A generic model evolved that identified 'at risk' female patients aged 65 years-plus by questionnaire-driven case finding, and pinpointed younger patients by the use of specific database searches. Those

with one major or two minor risk factors (identified in Table 1, opposite) were offered peripheral DXA scanning where appropriate to further refine their fracture risk.

These patients underwent structured clinical assessment and were advised on appropriate lifestyle and therapeutic interventions for both falls and osteoporosis risk. IT solutions to support clinical assessment were developed. These were populated with new read codes devised to support consistent assessment and audit. This dataset now comprises the coding infrastructure on the NOS website. Through partnership with the pharmaceutical industry and with the support of the then Severn NHS Community Trust and Stroud and Berkeley Vale Primary Care Group, a nurse specialist was funded over three years and 12 partner practices were recruited, covering a population of over 70,000.

Results

Five per cent of the population (3,655 from an overall population of 71,433 within the participating practices) were identified as being at risk, of which approximately 25% had BMD in the osteoporotic range (T score ≤−2.5) and 24% in the osteopenic range (T score ≤−1.0 and >−2.5) on forearm DXA scan (Figure 1).

By the end of the project, all of the 'at risk' patients had undergone forearm DXA. An audit of 83% of that population indicated that 1,437 new patients with a combination of risk factors and low BMD at the forearm had been identified, systematically assessed and advised.

Prescribing cost increases were monitored. Expenditure on bone remodelling agents, calcium and vitamin D3 preparations – excluding HRT – was £219,000/100,000 of the patient population (6.7% above norms[5]) in the calendar year 2002. Predicted growth in prescribing (had the project continued across the entire PCT) mirrored national growth rates across the expected timescale. These comparisons were not weighted to allow for the demographic shift towards the elderly in the Cotswolds.

> **Five per cent of the population were identified as being at risk**

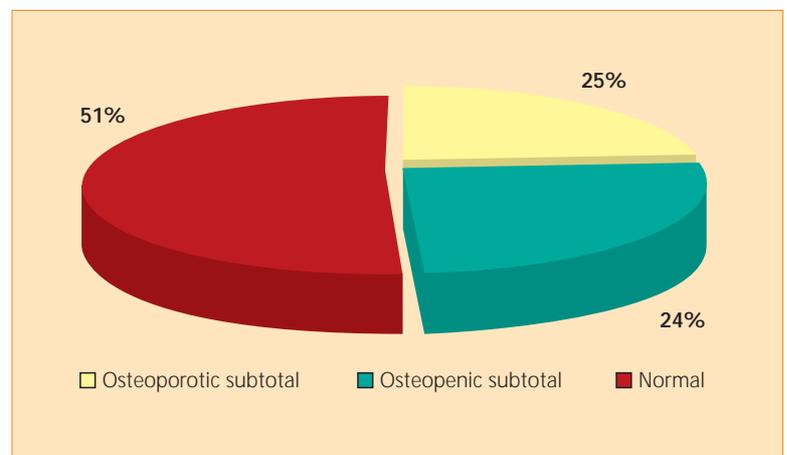Geraldine Carter, right, carries out a forearm DXA scan on a patient

Figure 1. Results of forearm DXA scans for the PCT, June 2003 (n=3,655 from population of 71,433)

Pie chart segments: 51% Normal, 25% Osteoporotic subtotal, 24% Osteopenic subtotal.
Legend: □ Osteoporotic subtotal □ Osteopenic subtotal ■ Normal

Pharmacological audit

It is generally recommended that bisphosphonates are reserved for those with the highest risk of fractures. The prescribing pattern achieved across the audited population (Table 2, opposite) showed a low prescribing rate for bisphosphonates in younger patients (under 65-year-olds) where the absolute ten-year risk of hip fracture is small even with an osteoporotic BMD.[6] Similarly, few patients with an osteopenic forearm DXA scan received bisphosphonates (9.3%) and nearly half of those (43%) had a history of minimal trauma fracture where treatment is justified in the

Table 3. Subgroups stratified by risk gradient of falls and fractures

1. All patients in residential homes and nursing homes, or who are housebound or have severe mobility problems (including recurrent falls) living in the community

2. All patients with a prevalent vertebral fracture or low trauma fracture since age 50

3. All patients on oral steroids for more than three months at any dose

4. All patients with two previous falls in the last 12 months or one fall and abnormality of gait or balance

5. Other patients may be recognised as being at increased risk of fracture because of low BMD and/or the presence of combinations of other strong risk factors

presence of strong risk factors. Overall, 44.9% of 'osteoporotic' patients were taking bisphosphonate therapy. Nearly 70% of patients on bisphosphonates were also continuing to take co-prescribed calcium, or calcium and vitamin D3 preparations. All the randomised, controlled trials involving bisphosphonates had calcium, or calcium and vitamin D3, in both treatment and placebo arms.

PCOs are experiencing downward cost pressures on prescribing budgets and it is therefore important to demonstrate cost-effective prescribing when a systematic approach to fracture prevention is adopted.

The fracture rate at the pilot practice (Rowcroft Medical Centre) was followed because its chronological lead and robust data quality policies made it more likely that sufficient patient exposure to interventions had occurred and that any changes were likely to be measurable. Between Years 1 and 3 of the project, there was a 55% reduction of all fractures in females aged 65 years-plus (Figure 2).

Interpreting the data

A reduction of 47% in fractures requiring hospital admission in the same population was seen in Year 3 of the project (9/1,000) compared with Year 2 (17/1,000) – but these figures need to be interpreted with caution in the light of the limited numbers involved. The lack of reliable information on past and current fracture rates in partner practices, and in the PCT as a whole, made it impossible to put any reliance on the impact of interventions more widely than in the pilot practice. In addition, the duration of exposure to interventions
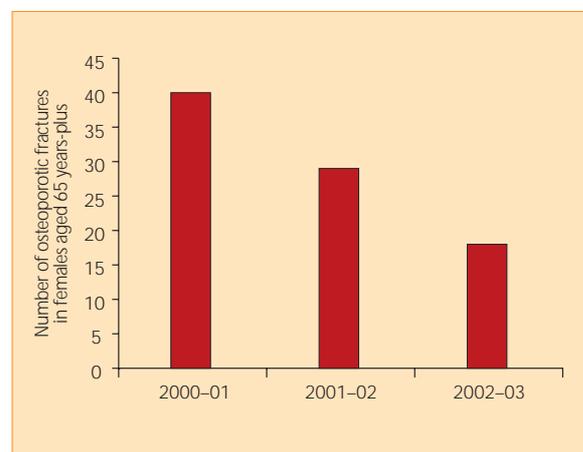

Figure 2. Osteoporotic fracture incidence in females aged 65 years-plus at Rowcroft Medical Centre (population 10,000)

by many of the patients in practices that joined later was insufficient to expect measurable benefit.

The barriers associated with a comprehensive approach such as this were perceived to be as follows.

Data quality

● Primary care, community- and hospital-based systems are poorly equipped to identify patients at high risk of fracture. Those using primary care systems can, with sufficient enthusiasm and training, be rapidly recruited to improve on this situation but it would still require the use of a questionnaire to fill data gaps, and rigorous recording of assessments in an electronic form so that subsequent monitoring of care standards could be effectively achieved.

● Identification rates for risk factors in females aged 65 years-plus in this project were likely to be high, as the questionnaire achieved a

90–95% response rate. In younger patients, where case finding depended on database queries of recorded risk factors, then identification rates may have been less. This was considered acceptable as these patients, by virtue of their age, would have a lower absolute fracture risk.

Gaining acceptance and resources

● In general, the burden of health and social care of osteoporotic fracture receives a lower priority in overspent PCTs than other mandated health priorities (as shown by the fact that the host PCO was not able to support the continuation of this work). The major expenditure on osteoporotic fractures is in the area of social care and, to a lesser extent, the acute sector. PCOs face the highest expenditure on prevention with the lowest gain and so the other key stakeholders need to be involved in the commissioning process.

A stratified approach

A stratified approach (see Table 3, opposite) that attempts to deal with the highest risk groups first may be more easily accepted. In this case, the group at highest risk would be residential or nursing home patients or those with severe mobility problems living within the community, followed by all patients with a prevalent vertebral fracture or low trauma fracture since the age of 50. Other groups at high risk of osteoporotic fracture are patients on oral steroids for more than three months (at any dose); patients with two previous falls within the past year or one fall and gait or balance abnormality; and patients with low BMD and/or other major risk factors.

Omission from the new GMS contract

The absence of standards relating to falls and fractures within the quality outcomes framework (QOF) in the new contract for general practitioners is to be regretted, particularly when it relates to a condition that involved more than two million hospital bed-days for all relevant fractures and more than 1.5 million bed-days for fractured femur alone in those over 60 in 2002–2003. This is more than the figures recorded by the DoH for all-age admissions for either myocardial ischaemia, diabetes or heart failure.[7]

A systematic approach

A systematic and comprehensive approach to the prevention of osteoporotic fracture across a primary care organisation was developed based on national guidelines and evidence-based medicine. This approach was associated with demonstrated rational and conservative prescribing within a budget near national norms. In the pilot practice, where innovative energy and the benefits of a chronological lead may have led to more clearly identifiable benefits, a marked reduction in fractures among the target population was observed.

> **PCOs face the highest expenditure on prevention with the lowest gain**

References
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Key points

● The project aimed to identify patients at risk of osteoporotic fracture and to intervene in such cases.

● Between Years 1 and 3 of the project there was a reduction of 55% of all fractures in females aged 65 years-plus within the pilot practice.

● Osteoporotic fracture still remains a low priority for many PCTs as they face the highest expenditure for a perceived lesser gain.

● It is unfortunate, in terms of improving the identification of osteoporosis, that the condition has not been made a priority in the new GMS contract.

● It is essential that the key stakeholders responsible for social and acute care are involved in the commissioning process.