Osteoporosis
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Original Article

Opinions and Experiences in General Practice on Osteoporosis Prevention, Diagnosis and Management

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Abstract. We determined to survey the general practice population regarding their attitudes to and knowledge of osteoporosis as a baseline prior to publication of national guidelines for the management of osteoporosis. All 2515 general practitioners registered in the 10 Health Authorities of the North Thames region, London, UK were surveyed by a postal questionnaire. Responses relating to epidemiology, public health and education on osteoporosis were analyzed. The overall response was 1153 (46%). General practitioners who responded were younger, predominantly female and in group practice. There is considerable awareness of the importance of preventing osteoporosis. General practitioners are active in identifying groups at risk, particularly those who are aged 40 years and older. A prevention strategy for osteoporosis is viewed as effective. However, two thirds of general practitioners remain unconvinced about the efficacy of drug therapy. Education on osteoporosis is considered inadequate. General practitioners would welcome further information on management issues and access to osteoporosis services. In conclusion, educational initiatives will be important both at undergraduate and postgraduate levels to increase awareness and knowledge of osteoporosis. General practitioners are aware of the public health impact of this condition and express a preference for educational material of direct relevance to the care of their patients. Therefore better cooperation between primary and secondary care should lead to ways of breaking down barriers to change in clinical practice and promoting fully integrated care of patients with osteoporosis.

Keywords: General practice; Medical education; Osteoporosis

Introduction

In 1998 the economic cost to the UK of osteoporotic fractures was evaluated at £942 m [1]. In addition there is considerable mortality and morbidity: hip fractures have a 30% mortality rate at 1 year, predominantly in those over 70 years, and 46% of patients are housebound after fracture [2]. The increasing age of the population worldwide has led to projections indicating a trebling in the number of hip fractures by the year 2050 compared with figures at the beginning of the 1990s [3].

Although low bone mass can be identified by bone densitometry and treatment can halve the risk of fracture [4–7], population screening remains unfeasible. Therefore assessment of clinical risk factors, to identify patients who are at increased risk of osteoporosis and fracture, remains the main means of patient selection. Awareness of and knowledge about osteoporosis possessed by individual practitioners, in both primary and secondary care, are fundamental to this approach. Setting guidelines could be useful for promoting awareness and providing an evidence-based framework of current knowledge about the management of osteoporosis. However, producing guidelines per se does not lead to changes in practice [8], though locally derived care pathways may enhance clinical use by integrating selected guideline recommendations [9].

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The National Osteoporosis Society (NOS) recently conducted a survey of current diagnosis and management of osteoporosis by general practitioners (GPs) [10] in order to evaluate the future impact of national guidelines. Their findings showed that GPs had considerable awareness of the public health importance of osteoporosis. In practice there was poor awareness of guidelines and few GPs were involved in health care initiatives for osteoporosis at a local level. A low response and lack of information on the non-responders limited their conclusions. We set out to determine the prevailing views regarding osteoporosis prevention, diagnosis and treatment among GPs in the North Thames region in the UK.

Method

A postal questionnaire survey was sent to all 2515 registered GPs in the 10 Health Authorities of the North Thames region in the UK. Each Health Authority provided a General Practice list for their area. Data on the date of birth for individual GPs was not available so we used the year of primary qualification as a surrogate for age in our analysis.

The questionnaire was originally designed for use in the USA, but was adapted to account for the British health care system. Four main areas were covered: opinions regarding epidemiology and the health care impact of osteoporosis, undergraduate and postgraduate education related to osteoporosis, understanding of its diagnosis and management, and existing local service provisions. The questionnaire consisted of 26 questions resulting in 66 individual items of information and included an open-ended section for comments. Each item was individually coded to allow easy entry into a database.

Each GP was allocated an individual identification number and was sent a questionnaire, a covering letter providing details of the proposed study and a pre-paid envelope in October 1998. A second mailing was sent out three months later to all those who had failed to respond. All questionnaires received within three months of the second mailing were included for analysis.

For the purpose of this publication the analysis was restricted to questionnaire responses relating to epidemiology and education.

Statistical Analysis

Data handling and statistical analysis were performed using the Statistical Package for Social Sciences version 9 (SPSS, IL, USA). For the difference between those who responded (responders) and those who did not (non-responders) the Mann–Whitney test was used to compare year of qualification between the groups. A p value of 0.05 (two-tailed) was used to define statistical significance. For gender and practice type the 95% confidence interval for the difference in proportions [11] was calculated for responders and non-responders. The

typical width of the 95% confidence interval on the proportions [12] giving a particular response to a question was calculated.

Results

Analysis of Responders and Non-responders

Figure 1 shows a flow chart detailing the response outcomes for all the questionnaires sent. The overall response was 1153 (46%). Twenty-two GPs were excluded from the responder/non-responder analysis because they inadvertently received duplicate codes.

Table 1 shows the demographic details for responders versus non-responders. Responders had qualified slightly more recently than non-responders ($p < 0.001$). There was a significantly higher proportion of women responders than non-responders and significantly fewer single-handed GPs replied to the questionnaire.
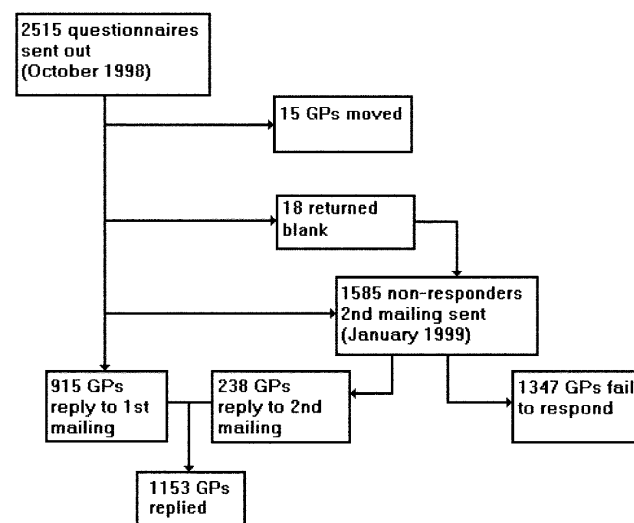

Fig. 1. Response outcome to our mailed questionnaire survey of all registered GPs in the North Thames region.

Table 1. Analysis of demographic variables of all the GPs surveyed according to response or non-response

	Responders	Non-responders
Female gender[a]	505 (55%)	412 (45%)
Male gender	603 (41%)	881 (59%)
Year of qualification[b]	1978	1976
	(1971–1985)	(1969–1983)
Group practice	976 (49%)	993 (51%)
Single practice[a]	167 (32%)	358 (68%)

Year of qualification is shown as median (interquartile range); gender and practice type are numbers (%).
[a]95% confidence interval of the difference in proportions shows a significant difference.
[b]Mann-Whitney test $p < 0.001$.

Table 2. Frequencies of response to questions by GPs in North Thames region

Question	Replies		
	Not important	*Somewhat*	*Important/ Very important*
How would you rate the importance of preventing osteoporosis? (1130)	4 (0.4%)	73 (6.5%)	1053 (93.1%)
	Do not	*Somewhat*	*Great*
To what extent do you believe that osteoporosis can be prevented? (1132)	3 (0.3%)	523 (46.2%)	606 (53.5%)
To what extent do you believe that the treatments for osteoporosis are effective? (1131)	5 (0.4%)	771 (68.2%)	355 (31.4%)
	Do not/Rarely	*Sometimes*	*Often*
How frequently do you raise the issue of osteoporosis with patients at risk of osteoporosis? (1125)	46 (4.1%)	487 (43.3%)	592 (52.6%)
How often do patients raise the issue of osteoporosis? (1123)	298 (26.6%)	663 (59%)	162 (14.4%)
	None/Few	*Some*	*Most*
To what extent do you believe your patients would change their behavior to prevent osteoporosis? (1124)	291 (25.9%)	739 (65.7%)	94 (8.4%)
To what extent do you feel your patients with osteoporosis would adhere to long-term treatment? (1100)	71 (6.5%)	631 (57.4%)	398 (36.2%)
	Minimal/None	*Sufficient*	*Excessive*
How would you rate the exposure to teaching you received on osteoporosis in medical school? (1109)	976 (88%)	128 (11.5%)	5 (0.5%)
How would you rate your exposure to teaching during postgraduate training? (1106)	603 (54.5%)	491 (44.4%)	12 (1.1%)
	Very difficult/ Difficult	*Easy*	*Very easy*
How would you rate ease of access to information about osteoporosis? (1098)	284 (26%)	751 (68%)	63 (6%)

Number of responses (%) for each response are shown. The number after each question is the total number of valid replies received for that question. The typical width of the 95% confidence interval is $\pm 3\%$.

Responses to Questionnaire

Table 2 shows the analysis of responses to individual questions from the questionnaire. The typical width of the 95% confidence interval on the proportion of GPs giving a particular response to a question was calculated as $\pm 3\%$. For ease of presentation some of the reply categories were merged when the number of replies was very low. This is indicated in the column headings where it occurs.

Table 3 shows that most GPs thought it was important to approach patients aged 40 years and above to discuss issues relating to osteoporosis.

Table 4 shows which sources of information are used by GPs. Only 25% stated that they rarely or never used guidelines. In contrast a subsequent question, which directly enquired whether GPs were aware of guidelines,

Table 3. 'With which age group(s) do you feel it is important to raise the issue of osteoporosis?'

Age group	No. of responses (%)
Children (0–8 years)	40 (4%)
Pre-teenage (8–12 years)	72 (6%)
Teenage (12–19 years)	238 (2%)
Early adulthood (19–40 years)	420 (37%)
Mid-life (40–66 years)	1044 (92%)
Elderly (>66 years)	937 (83%)

Values are the number (%) of responses from a total of 1134 responses received.

Table 4. 'How often do you use these sources of information?'

Source of information	Use			
	Frequently	Sometimes	Rare	Missing
Journals	356 (34%)	537 (51%)	121 (12%)	37 (3%)
Lectures	227 (22%)	509 (48%)	256 (24%)	59 (6%)
Drug promotions	151 (14%)	347 (33%)	469 (45%)	84 (8%)
Guidelines	303 (29%)	375 (36%)	272 (25%)	101 (10%)
Other	99 (10%)	265 (25%)	506 (48%)	181 (17%)

Values are the number (%) of GPs from 1051 responses.

found that only 42% of GPs declared any awareness of guidelines. Table 5 shows the diverse nature of guidelines these GPs were using. Table 6 shows that GPs would welcome information regarding prevention and

Table 5. Sources of guidelines used by the 480 of 1153 (42%) GPs who indicated they were using guidelines

Source of guidelines used	No. of responses (%)
Local general practice group	55 (12%)
Health Authority	20 (4%)
Hospital Trust	66 (14%)
National Osteoporosis Society	69 (14%)
Royal College of General Practitioners	2 (0.5%)
Royal College of Physicians	2 (0.5%)
Several national guidelines documents used	51 (10%)
Miscellaneous	96 (20%)
Incomplete	119 (25%)

Table 6. 'What kind of information on osteoporosis would you like?'

	Not like	Like	Most like	Missing
Prevention	67 (7%)	343 (37%)	475 (52%)	38 (4%)
Treatment	60 (7%)	433 (47%)	392 (42%)	38 (4%)
Services	117 (13%)	394 (43%)	342 (37%)	70 (7%)
Research	313 (34%)	315 (34%)	120 (13%)	175 (19%)

Values are the number (%) of GPs from 923 responses.

treatment of osteoporosis and are less interested in research results.

Discussion

The views on osteoporosis of general practitioners from the North Thames region were analyzed in this survey. The overall response to this survey was 46%. Although this does not represent the majority, we received the views of a substantial number of GPs (1153) in the North Thames region. Comparison with information relating to questionnaire surveys of medical practitioners suggests this is a relatively good response [13] and compares well with a recent survey of general practice by the NOS, which received 200 replies (20% response) [10].

It is possible that the differences found between responders and non-responders suggest that GPs who have qualified more recently have had more exposure to the problems and recommendations regarding osteoporosis and were therefore more motivated to reply. Similarly, female GPs may show more interest in a condition that has considerable impact on women's health and therefore are more ready to contribute their views. These differences suggest a considerable ''volunteer effect'' and therefore we might expect those GPs responding to be more aware of issues relating to osteoporosis.

A large proportion of the GPs (93%) who responded rated osteoporosis prevention as being of considerable importance. Although potentially biased, owing to the volunteer effect, in absolute terms there is considerable awareness within general practice of the impact of osteoporosis on public health. GPs believe osteoporosis prevention to be more effective than treatment for established disease. For osteoporosis there are limitations in this approach, since 60–80% of peak bone mass is determined genetically [14]. Lifestyle intervention strategies may well have a small effect in maximizing peak bone mass but they may have a larger impact on bone loss, which is largely environmentally determined [15]. Although the role of lifestyle modification remains to be proven, implementation of such strategies would require minimal cost. Effective drug therapy for prevention and treatment of osteoporosis can produce a 50% reduction in fracture risk [4–7]. However, despite the volunteer effect, two thirds of GPs remain unconvinced.

The GPs in this survey claim that they first raise the issue of osteoporosis with their patients rather than vice versa. This suggests that this group of GPs is taking a pro-active role in trying to identify patients at risk of osteoporosis. GPs in this survey are concentrating on the older age groups (40 years and above) to identify patients potentially at risk. At an interventional level this seems appropriate as the largest group at risk, postmenopausal women, will be identified and managed appropriately. Older patients, with established low bone mass, will also be identified and advised on treatment. However, assessment and discussion aimed at younger age groups to maximize peak bone mass may well be a more effective prevention strategy in the long term.

GPs report that patients are less likely to consider a change in behavior to prevent osteoporosis than to comply with long-term treatment for osteoporosis. Long-term compliance with medication for a chronic condition has been shown to be poor among patient groups [16]. This can be especially important when considering the long-term use of hormone replacement therapy [17]. Better compliance can be achieved when there is a clear incentive to avoid an unpleasant outcome (e.g., hip fracture, severe spinal deformity) and if there is regular monitoring [18,19]. Use of bone resorption markers for monitoring treatment may well provide a more prompt and cost-effective way of assessing treatment response than serial DXA scans [20,21]. This might have a significant impact on compliance, but will need to be further evaluated in clinical practice.

The need for better education throughout the training of doctors needs to be addressed. Most GPs report inadequate exposure to teaching on osteoporosis at medical school. Changes in the undergraduate medical curriculum, introducing problem-based learning and community-orientated teaching [22] should lead to a greater awareness of the public health impact of osteoporosis. GPs stated that access to information on osteoporosis was easy, and frequently used journals, lectures and guideline documents as sources of information; this knowledge should allow us to plan effective ways of disseminating information.

This survey was completed shortly before the introduction of national guidelines on osteoporosis by the Royal College of Physicians [23]. These guidelines should help to promote awareness of osteoporosis. Surveyed GPs expressed a preference for further education regarding current concepts in prevention and treatment of osteoporosis and in provision of osteoporosis-related services. Better cooperation between the primary and secondary care sectors should enhance continuing education, help to define appropriate care for the majority of patients with osteoporosis within general practice and provide clear indications for referral of more complex cases to secondary care. Further research should aim to establish how successfully the guidelines are implemented in primary care.

As the psychosocial processes involved in changing medical practice become better understood, we may be

in a stronger position to develop approaches to over-coming barriers to change in clinical practice [24].

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