Osteoporosis management in long-term care

Survey of Ontario physicians

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abstract

OBJECTIVE To survey physicians in Ontario regarding their approach to diagnosis and treatment of osteoporosis among residents of long-term care facilities.

DESIGN Mailed questionnaire covering physician demographics; current clinical practice relating to osteoporosis; and perceived barriers to prevention, diagnosis, and treatment of the disease.

SETTING Long-term care facilities in Ontario.

PARTICIPANTS Medical directors of long-term care facilities.

MAIN OUTCOME MEASURES Demographic variables; physician attitudes; and practices concerning awareness, diagnosis, and treatment of osteoporosis.

RESULTS Respondents returned 275 of 490 questionnaires, for a response rate of 56.1%. Most respondents (92.4%) were family physicians; 28.7% were caring for more than 100 patients in long-term care. Most (85.8%) saw from one to 10 hip fractures yearly in their practices. Although 49.6% of respondents estimated the prevalence of osteoporosis to be 40% to 80% among their long-term care patients, 45.5% said that they did not routinely assess their patients for the disease, and 26.8% do not routinely treat it. Half (50.9%) of physicians would treat patients at high risk based on clinical history; 47.9% if patients had a vertebral compression fracture on plain x-ray examination; 43.8% if patients were highly functional; 42.0% if osteoporosis were confirmed with bone mineral densitometry; and 30.0% if patients had a recent fracture. Perceived barriers to initiating treatment included cost of therapy, patient or family reluctance to accept therapy, and time or cost of diagnosis.

CONCLUSION Although physicians are aware that patients in long-term care facilities are at high risk for osteoporosis and hip fractures, the disease remains underdiagnosed and undertreated.

résumé

OBJECTIF Effectuer un sondage auprès des médecins en Ontario concernant leur approche au diagnostic et au traitement de l'ostéoporose chez les résidents d'établissements de soins prolongés.

CONCEPTION Un questionnaire envoyé par la poste portant sur les données démographiques des médecins; leur pratique clinique actuelle concernant l'ostéoporose; et les obstacles perçus à la prévention, au diagnostic et au traitement de la maladie.

CONTEXTE Des établissements de soins prolongés en Ontario.

PARTICIPANTS Les directeurs médicaux des établissements de soins prolongés.

PRINCIPALES MESURES DES RÉSULTATS Les variables démographiques; les attitudes des médecins; et les pratiques entourant la sensibilisation à l'ostéoporose, son diagnostic et son traitement.

RÉSULTATS Les répondants ont retourné 275 des 490 questionnaires, soit un taux de réponse de 56,1%. La majorité des répondants (92,4%) étaient des médecins de famille; 28,7% dispensaient des soins prolongés à plus de 100 patients. Quoique 49,6% des répondants estiment que la prévalence de l'ostéoporose se situait entre 40% et 80% chez les patients en établissement de soins prolongés, 45,5% des médecins ont dit ne pas procéder systématiquement à son dépistage chez les patients, et 26,8% ne la traitaient pas systématiquement. La moitié des médecins (50,9%) traiteraient les patients à risque élevé en se fondant sur l'anamnèse clinique; 47,9% si les patients présentaient une fracture de tassement vertébral observée par simple radiographie; 43,8% si les patients étaient très fonctionnels; 42,0% si l'ostéoporose avait été confirmée par une densitométrie de la teneur minérale osseuse; et 30,0% si les patients avaient subi une fracture récente. Au nombre des obstacles perçus à l'amorce d'un traitement figuraient le coût de la thérapie, l'hésitation du patient ou de sa famille à accepter la thérapie, ainsi que le temps et le coût du diagnostic.

CONCLUSION Même si les médecins savent que les patients dans les établissements de soins prolongés sont à risque élevé de souffrir d'ostéoporose et de subir une fracture de la hanche, la maladie demeure diagnostiquée et traitée insuffisamment.

This article has been peer reviewed.

Cet article a fait l'objet d'une évaluation externe.

Can Fam Physician 2000;46:2228-2235.

Osteoporosis is a skeletal disease characterized by low bone density leading to fractures after minimal trauma. Morbidity and secondary mortality related to this disease is substantial[1] and will continue to escalate as our population ages.

Fractures of the vertebrae, wrists, and (most importantly) hips are the main clinical manifestations of osteoporosis and the fragile bones that are a consequence of the disease. An estimated 70% of hip fractures are related to osteoporosis.[2] Goeree et al[3] have estimated that there were more than 21 000 osteoporosis-related hip fractures in Canada in 1993. An Ontario study suggests that the annual number of hip fractures in the province will double from 8490 in 1990 to an estimated 16 963 by the year 2010.[4]

Clinical practice guidelines for diagnosis and management of osteoporosis have been published recently and outline a consensus approach to this disease.[5]

Combined with clinical risk assessment, diagnostic tools are available now to help diagnose and monitor those affected by osteoporosis who are at increased risk for fractures. In addition, effective treatments with calcium and vitamin D supplements,[6-10] estrogen replacement,[11-15] and bisphosphonate therapy[16-18] are available to maintain or improve bone strength and reduce fracture risk.

Residents of long-term care (LTC) facilities (homes for the aged, nursing homes) suffer a disproportionate number of falls and fractures,[19,20] accounting for approximately 30% of hip fractures. Osteoporosis afflicts many LTC residents. The extent to which this high-risk population is being screened or treated for osteoporosis is unclear, but is suspected to be very low. In addition, accumulating evidence suggests that hip fractures are preventable among both community-dwelling and institutionalized elderly.[7,18,21]

A literature search was conducted on MEDLINE using the MeSH headings osteoporosis, nursing homes, long-term care, diagnosis, and treatment. Although many articles addressed the issues of prevalence, associated fracture risk, and treatment, none had assessed physicians' knowledge and practice patterns related to osteoporosis in LTC facilities. A recent study of prescribing practices[22] identified substantial undertreatment of osteoporosis in LTC facilities. This study used a large commercial pharmacy database to demonstrate a very low rate of use for calcium and vitamin D in Ontario LTC settings.

Our study was intended to further explore this issue by surveying physicians in Ontario about their approach to diagnosis and treatment of osteoporosis in residents of LTC facilities and to gain insight into current primary practice related to this very common disorder in a high-risk population.

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METHODS

Sample population

Four hundred ninety questionnaires were mailed to medical directors and advisors of LTC facilities in Ontario. This group was chosen as an easily identifiable group of physicians offering primary care to LTC patients. The list of physicians and facilities was obtained from the Ontario Association of Medical Directors of Homes for the Aged and Nursing Homes. As this mailing list was obtained from an association with voluntary membership, it is likely that it did not contain the names of all LTC facilities in the province. To maximize the response rate, a follow-up reminder was sent to nonrespondents after 2 months.

Questionnaire design

Based on Dillman's[23] principles of questionnaire design, a questionnaire was developed to survey physicians about their approach to diagnosis and treatment of osteoporosis in residents of LTC facilities. Sixteen questions asked about physician demographics; current clinical practice relating to osteoporosis; and perceived barriers to prevention, diagnosis, and treatment of the disease in LTC settings. A section requested open-ended comments on the issues. The questionnaire was pilot-tested on six physicians (three family physicians who worked in LTC facilities and three geriatricians) to assess clarity and relevance (face validity) and to evaluate ambiguity and completeness. Suggestions were considered and incorporated into the final version where appropriate.

Analysis

Returned questionnaires were subjected to descriptive analysis using SPSS statistical software. Open-ended questions were reviewed and lists of

categories were designed to cover all the responses. Two of the investigators (R.C. and M.K.) independently classified all the responses into categories, compared their decisions, discussed discrepancies, and agreed on resolutions.

Table 1. **Physician demographics (n = 275):** *Totals vary because some respondents did not answer all questions.*

PHYSICIAN CHARACTERISTICS	N	%
SPECIALITY		
Family practice	254	92.4
Internal medicine	3	1.1
Geriatrics	7	2.5
Other	2	0.7
PRACTICE GROUP SIZE		
Solo	122	44.4
Two physicians	39	14.2
Three to five physicians	65	23.6
More than five physicians	45	16.4
PRACTICE SETTING		
Rural	140	50.9
Urban	118	42.9
Teaching centre	13	4.7
APPROXIMATE SIZE OF PRACTICE		
<1000 patients	40	14.5
1000-1499 patients	48	17.5
1500-1999 patients	62	22.5
2000-2499 patients	51	18.5
>2499 patients	65	23.6
LONG-TERM CARE PATIENTS		
1-24	28	10.2
25-49	41	14.9
50-74	73	26.5
75-100	43	15.6
>100	79	28.7
HIP FRACTURES IN PAST YEAR		
None	26	9.5
1-5	184	66.9
6-10	34	12.4
>10	18	6.5

RESULTS

From the first mailing, 189 questionnaires were returned, giving an initial response rate of 38.6%. A further 86 questionnaires were returned from the second mailing, for a total of 275 and an overall response rate of 56.1%.

Table 1 shows physician demographics, including specialty, practice group size, practice setting, and approximate practice size. Most (92.4%) medical directors and advisors of LTC facilities responding to the survey were family physicians. Forty-four percent were in solo practice, and 50.9% were in rural practice. Most (58.5%) had between 1000 and 2500 patients in their practices, and 42% had between 50 and 100 LTC patients. Hip fractures were considered common in the latter population.

These physicians' approach to assessment of patients for osteoporosis is summarized in **Figure 1**. Although many physicians rely on clinical risk factors (51.5%) when assessing osteoporosis, many (45.5%) do not routinely assess for this condition. This is despite the fact that physicians estimate the prevalence of osteoporosis in this population averages about 50% (**Figure 2**). There is relatively little attempt to assess patients by either x-ray examination (21.6%) or by bone density measurement (22.7%).

Even when a vertebral fracture is evident on x-ray film, fewer than half of physicians would initiate treatment **(Figure 3**). Physicians would be more ready to treat osteoporosis if a high risk were identified by history. Even when the condition is diagnosed, there is surprisingly little attempt to treat it (**Figure 4**). About a third of physicians believed that treatment has not been proven effective, while many quote cost, both of therapy and investigations, as being important in their decision making (**Figure 5**).

The questionnaire also asked respondents to offer comments about assessing and treating osteoporosis. Regarding physician education, 76 physicians made comments either expressing a desire for more information or expressing uncertainty about available evidence. Of the 76, three requested educational seminars and a further six expressed uncertainty about various aspects of management. Two were uncertain how to diagnose osteoporosis in this population. Six believed that hip fracture was unrelated to osteoporosis, and 13 stated that treatment was of little or doubtful value; one considered it still experimental. Thirty-eight stated that evidence for effective treatment in this patient population was absent or unproven, while a further 15 requested development of peer-reviewed guidelines.

Figure 1. **Methods of assessing long-term care patients for osteoporosis (n = 264)**

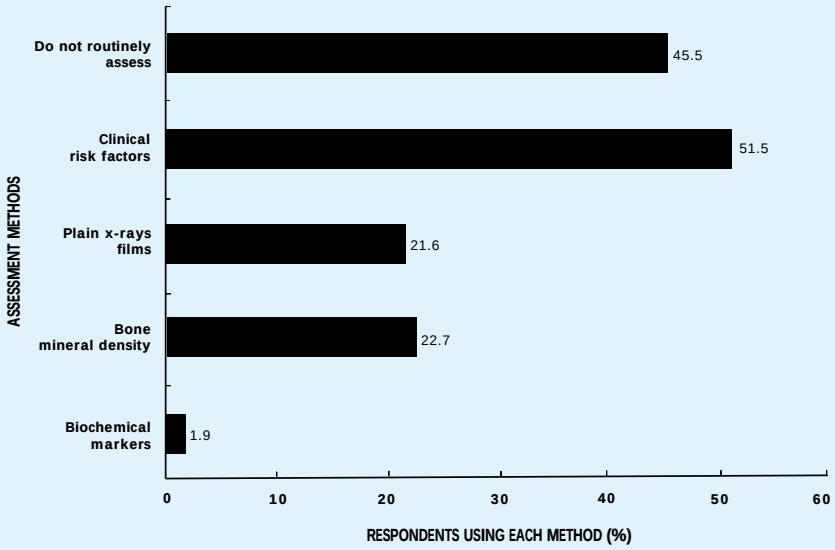
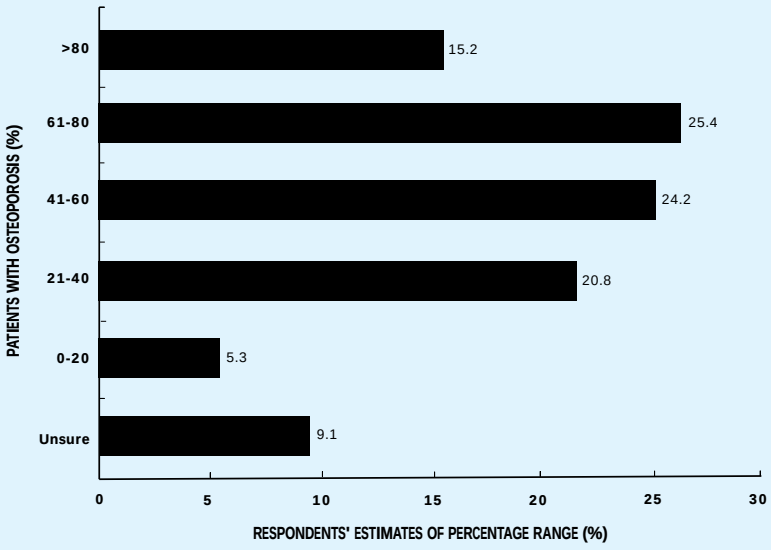


Figure 2. **Estimated percentage of long-term care patients with osteoporosis (n = 264)**



Seventy-three physicians believed that patients were too frail and it was too late, or there was too little life left to justify treatment. Twenty-seven of these respondents specifically mentioned the presence of dementia as a factor making treatment futile.

Fourteen physicians commented that prevention of fractures through prevention of falls was the critical issue, two commenting that pads or protective clothing should be used or tried, and one expressing the view that falls were virtually impossible to prevent. Twelve thought that exercise should be the main approach to treatment, although only one stated its purpose: to reduce falls. Of the 12, five believed there were insufficient resources (eg, physiotherapy) to maintain mobility in nursing home residents.

Thirty-two physicians expressed concerns over medication use in the elderly, four expressing concern about side effects, but most (28) expressing concern about the already extensive lists of drugs being taken by their patients and about adding to polypharmacy.

Six expressed concern that medications or investigations were too expensive; 25 thought that treatment was not or had not been shown to be cost effective. Another 12 believed that lack of coverage for some medications (calcium, vitamin D, alendronate) on the Ontario Drug Benefit Formulary was an obstacle to treatment.

DISCUSSION

Osteoporosis is known to be associated with significant morbidity and cost, both for affected patients and for the health care system. It is largely a disease of old age and will affect a growing percentage of our

Figure 3. **When is treatment of osteoporosis initiated? (n = 265)**

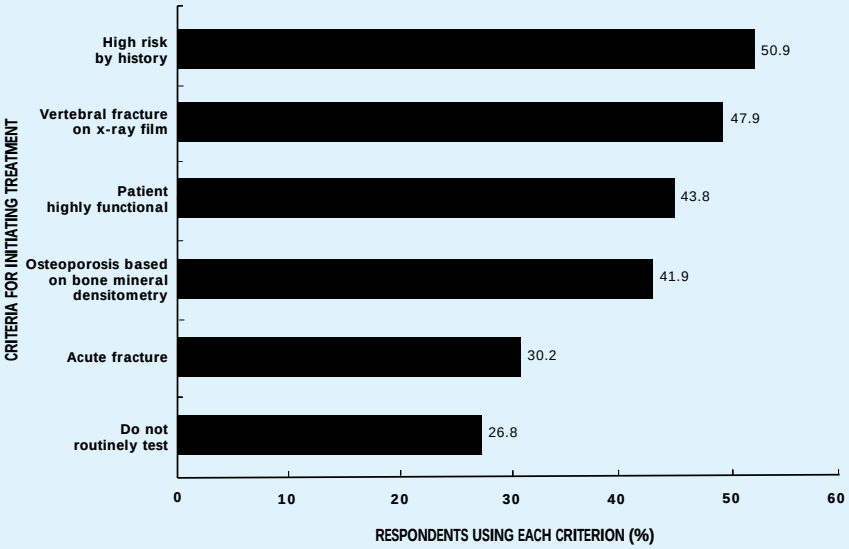


Figure 4. **Estimated percentage of long-term care patients with osteoporosis who are being treated (n=183)**

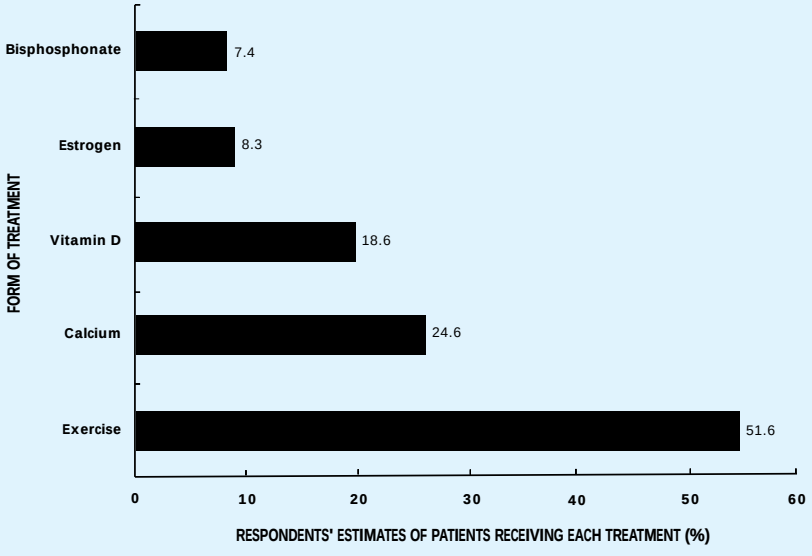
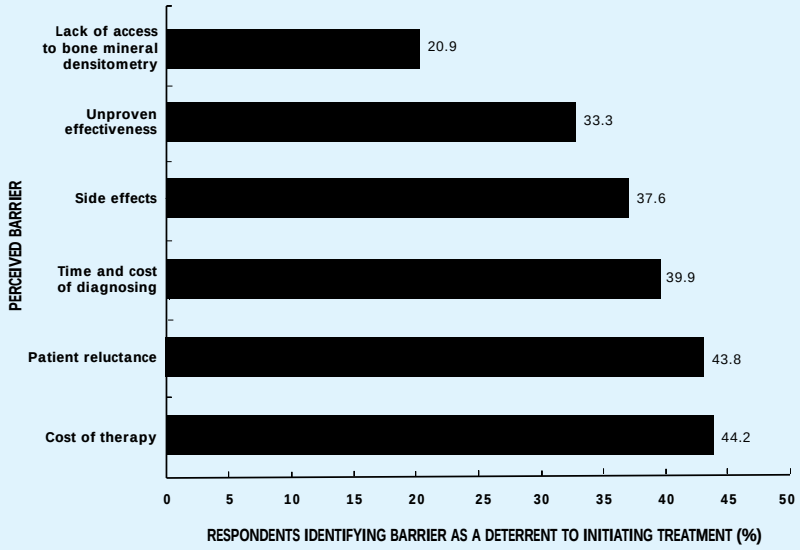


Figure 5. **Barriers to initiating treatment for osteoporosis (n = 258)**



population as it ages over the next decades. Residents of LTC facilities have a high incidence of osteoporosis related to many factors including age, sex, immobility, and reduced vitamin D stores. The current study highlights several important issues related to osteoporosis in LTC settings, including physician attitudes and practices related to awareness, diagnosis, and treatment of osteoporosis.

While most physicians caring for residents in LTC facilities are aware of potential problems associated with osteoporosis (eg, hip fractures), barriers to diagnosis and treatment of the condition exist. Whereas nearly 50% of respondents estimated that 40% to 80% of their LTC patients had osteoporosis, 45.5% did not routinely assess their patients for the disease and 26.8% did not routinely treat it.

One might question physicians' estimates of the prevalence of osteoporosis and, by extension, their estimates of treatment in their practices. A study of Maryland nursing home residents found that 63.5% of women aged 65 to 74, and 85.9% of those older than 85 years, had osteoporosis based on bone mineral densitometry.[24] In the current study, physicians' estimates of osteoporosis prevalence averaged 50% for the mixed population (female and male patients, all ages) in their facilities and therefore seems close to the mark. An estimated annual hip fracture rate of one to five in a population of, on average, about 100 patients is also in keeping with a study showing an annual incidence of 3.7% in a population of institutionalized elderly people.[25]

This discrepancy between awareness and treatment of osteoporosis could stem from identified barriers to initiating therapy. Some of these barriers, however, could be more perceived than real. For instance, a substantial number of respondents cited cost, unproven effectiveness, and side effects of therapy as deterrents to treatment. Although a prescription for one of the currently available bisphosphonates can range from $175.00 to $750.00 yearly, these drugs are effective in increasing bone density and reducing fracture rates[16,17] and one agent (etidronate) is covered on the Ontario provincial formulary. Use of calcium supplements (1000 mg/d) and vitamin D (1000 IU/d) costs only about $30.00 yearly. This intervention has been shown to reduce the rate of hip fractures by 30% in female nursing home residents over a period of 18 to 36 months[7,8] and has relatively few, if any, adverse effects. Estrogen therapy, too, is beneficial in treating and preventing postmenopausal osteoporosis and reducing morbidity from fractures[12,13] and continues to offer benefit, even many years after menopause.[26]

Considering the substantial cost of hip fractures to the system (mostly for acute orthopedic care) and the degree of attendant morbidity and mortality, using these therapies for all patients at risk could be justified. If a relatively inexpensive treatment, such as daily vitamin D and calcium supplementation, can significantly reduce hip fractures, coverage on the provincial formulary would be cost effective for the system. Torgerson and Kanis[9] estimated the cost effectiveness of preventing hip fractures in elderly

people using vitamin D and calcium. They concluded that annual injections of vitamin D to all elderly women (community-dwelling and institutionalized) would result in savings for the British National Health Service; addition of calcium would be cost effective only if it were given to high-risk groups who have a higher fracture rate.

This evidence indicates that hip fractures can be reduced in the frail elderly at reasonable cost. Further, there will be few or no side effects at the doses used, thus removing the need for monitoring and, it could be argued, for any diagnostic investigation before initiating therapy. For those with severe osteoporosis (low bone mineral density and fractures), bisphosphonates could be given with the expectation that more than 80% will gain increased bone density.[27] Response to treatment is independent of the age of patients.[17]

Another underlying barrier to treatment of osteoporosis is physicians' perception of benefits and effectiveness of current treatments for these patients. Some of these issues were reflected in respondents' comments. Some expressed a feeling of futility when it came to treating debilitated elderly patients. Other pertinent issues raised were the cost effectiveness of treatments; the risks of polypharmacy, strategies to reduce falls; access to diagnostic tests (bone mineral densitometry); and clear clinical guidelines for prevention, assessment, and treatment of osteoporosis.

Deciding where to draw the line

Many of these issues are valid and important. Evidence does not allow us to select LTC patients who will benefit most or to determine those in whom intervention will be futile. Common sense guides most physicians in making these decisions, but we all differ in where we draw the line; evidence is needed to guide us more consistently. Nonetheless fewer patients than could be appear to be treated. These issues will need to be addressed in educational initiatives designed to enhance management of osteoporosis in LTC settings.

How can we heighten physician awareness and promote diagnosis and treatment of osteoporosis in this group of patients? Guidelines for diagnosis and management of osteoporosis[5] are not being widely implemented in LTC populations. Studies of physician practices indicate that development and publication of clinical practice guidelines alone are insufficient to stimulate change in medical practice.[28] Some type of educational initiative must incorporate the guidelines to promote wider dissemination and use. Practice- and community-based educational strategies have been shown to be more effective in continuing medical education than traditional didactic strategies.[29] The current study highlights some deficiencies in the clinical approach to osteoporosis in LTC patients and provides a baseline for designing an educational initiative for family physicians who work with this population.

Key points

- This study reports on a survey of medical directors of long-term care facilities concerning diagnosis and treatment of osteoporosis.
- These physicians estimated that about half their patients had osteoporosis and were at risk for hip and vertebral fractures.
- Osteoporosis in this population, however, was underdiagnosed and undertreated.
- Barriers were perceived unproven effectiveness of treatments, side effects, cost of investigations and treatment, polypharmacy issues, and patient reluctance to accept therapy.

Points de repère

- L'étude rapporte les résultats d'un sondage auprès des directeurs médicaux d'établissements de soins prolongés concernant le diagnostic et le traitement de l'ostéoporose.
- Ces médecins estiment qu'environ la moitié de leurs patients souffraient d'ostéoporose et présentaient des risques élevés de fracture de la hanche ou d'une vertèbre.
- Par ailleurs, l'ostéoporose dans cette population était diagnostiquée et traitée de manière insuffisante.
- Les obstacles perçus se situaient dans l'absence de preuves de l'efficacité des traitements, les effets secondaires, le coût des investigations et du traitement, les questions de polypharmacie et l'hésitation des patients à suivre la thérapie.

Limitations

There are some limitations in the current study, including the surveyed population of physicians. The intent was to survey physicians who worked in LTC facilities who would best be able to give an overview of osteoporosis treatment in this setting. To target this group of physicians most effectively, questionnaires were mailed to medical directors and advisors of LTC facilities. This could have excluded physicians who

care for a substantial number of LTC residents but who are not medical directors of the facilities. Nonetheless, responses show that the survey population was largely composed of family physicians caring for large numbers (50 to 100 in each practice) of LTC residents.

We do not know whether all LTC facilities in Ontario received surveys. The list of facilities used for the mailing was obtained from the Ontario Association of Medical Directors of Homes for the Aged and Nursing Homes, which (although voluntary) has a large membership and provided a mailing list of more than 450 facilities throughout the province. Despite these limitations, it is likely that the survey reached a representative sample of facilities and practitioners involved in caring for LTC residents.

Conclusion

This survey of medical directors of LTC facilities in Ontario highlights several important issues about physicians' attitudes and practices related to awareness, diagnosis, and treatment of osteoporosis. Although physicians are aware that their patients in LTC facilities are at high risk for osteoporosis and hip fractures, the disease remains underdiagnosed and undertreated. Information obtained from this survey could provide a baseline for designing an educational initiative for family physicians who work with these patients.

Acknowledgment

We acknowledge a community research grant from Merck-Frosst Canada, Limited, in support of this research and the secretarial assistance of Ms J. Hansen at the Regional Geriatric Program of Parkwood Hospital in London, Ont.

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