Management and Patient Knowledge of Osteoporosis

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ABSTRACT

Osteoporosis is a bone disease contributing to annual mortalities and morbidities. Proper management is necessary to help prevent progression and further complications of the disease. This study aimed to identify risk factors, assess patients' knowledge and evaluate prescribing trends. Two questionnaires were designed and validated to identify patients' risk factors, assess knowledge of osteoporosis and evaluate the services offered and to identify prescribing trends. Sixty-five patients undergoing routine bone density scanning participated in the study with a mean age group of over 60 years. The mean lumbar T score at L2-L4 was -2.90 while the mean hip T score was -1.93 at the Ward's triangle. The commonest risk factor was a post-menopausal state (n=54), followed by lack of exercise (n=38). Patients attained an average score of 10.2 (51%) when they were assessed on their knowledge. Bisphosphonates with calcium supplements (n=22) were the most often prescribed combination of drugs. Local prescribing trends compare to established NICE guidelines with regards to treatment and patient referral for bone mineral density scanning. Similar to the findings in other studies, patients' knowledge of the disease remains rudimentary.

Keywords: Osteoporosis, bone mineral density, bisphosphonates, corticosteroid-induced osteoporosis, menopause, calcium
INTRODUCTION

Osteoporosis and its consequences of low trauma fractures may be regarded as a major source of mortality, morbidity and medical expenditure worldwide which increases annually as the world population ages (Limpaphayom, 2002). It has been estimated that 75 million people in Europe, Japan and the USA combined are affected by osteoporosis (IOF, 2000) and it is responsible for more than 1.5 million fractures annually (Lee et al, 2002).

Although this disease is achieving increased recognition by health care professionals (HCPs), patients and the general public, there is still a lack of information with the result that the condition is usually associated only with older women entering their menopause (Davis, 1999). Although there are a number of treatment options available to the patients, there is still a significant number of patients who have compliance issues or face treatment barriers like side effects, interactions and access due to expense (Adachi et al, 2011). Education regarding the condition and the relevance of preventive measures are of utmost importance to increase patients’ awareness and to decrease the progression and the risks associated with this disease.

Studies show that a considerable number of people are unaware of the risk factors and consequences of osteoporosis (Mehmet et al, 2001). This study was performed in Malta with the aims of identifying local risk factors, assessing patients’ knowledge, and evaluating treatment prescribed to patients.

METHOD

A patient questionnaire was adopted from a previously validated study carried out in Australia (Fendin et al, 2003). The form included questions on risk factors, questions on knowledge levels, bone mass density levels, treatment taken by patient and any problems encountered by the patient. This questionnaire was validated by a panel of health care professionals including two gynaecologists, one rheumatologist and two pharmacists. A covering letter describing the nature and aims of the study was designed in both English and Maltese. A covering letter was given to each patient prior to study together with a consent form which the patient had to sign indicating his/her wish to participate voluntarily in this study. The patient questionnaire was used in a pilot study in which the test-retest coefficient method was adopted. Results of the pilot study were analysed using Bio-Medical Package Software (BMDP) 2007 where data were compared at time zero and after two weeks when the patient questionnaire for the pilot study was repeated. A high correlation coefficient of 0.76 was obtained and the questionnaire used for the main study.

Patients suffering from osteoporosis were interviewed using the patient questionnaire at Bone Density Unit at St. Luke’s Hospital and when the unit was transferred to the new Mater Hospital. These patients had a T score of -2.5 below with or without treatment at the lumbar spine level or at both levels.

A second questionnaire was developed based on National Institute of Clinical Excellence (NICE) guidelines issued in 2006 and 2008 and addressed to health care professionals that allowed to prescribe medications in osteoporosis patients. The questionnaire covered issues choosing the best treatment in several scenarios patient management and advice, bone mass densitometry, management of patients with corticosteroid-induced osteoporosis and assessment of services offered to the patients.

Results of both questionnaires were coded and analysed using Microsoft Excel 2007 with statistical analysis was carried out using BM Statistical analysis included a Chi-squared test to find relationship between answer options provided by gynaecologists and rheumatologists, one-way Anova testing to compare bone mineral density of the hip and spine levels and t-test to check relationship between knowledge and risk factors.

RESULTS

Sixty-five patients participated in the study: 2 men and 63 females having a mean age group of 60 to
The mean lumbar T score was -2.90 (range -0.1: -4.91) while the mean hip T score was -1.932 (range -0.09 to -3.36). The commonest risk factor was menopause (n=54), followed by lack of exercise (n=38) and a family history of osteoporosis (n=7).

When patient knowledge was assessed, patients obtained an average score of 10.2 out of 20 (51%). The score ranged from a minimum of 4 (20%) to a maximum of 17 (85%).

Bisphosphonates with calcium supplements (n=54) were the most prescribed drugs followed by bisphosphonates alone (n=9), calcium supplements alone (n=9) and strontium ranelate (n=9) (Table 1).

When asked about the information given, healthcare professionals (HCPs), 41 patients (63.08%) answered that their HCP provided information on osteoporosis, 37 patients (56.92%) said that their HCP discussed treatment, 36 patients (55.38%) answered that they were given advice

| Table 1. Prescribed treatment amongst patients (n=65) |
|----------------|----------------|
| Treatment                                | Number of Patients |
| Bisphosphonate alone                     | 9               |
| Bisphosphonate with calcium and vitamin D| 23              |
| Combination of two bisphosphonates       | 4               |
| Strontium Ranelate alone                 | 5               |
| Strontium Ranelate with calcium and vitamin D | 10          |
| HRT                                       | 2               |
| Raloxifene                                | 1               |
| Raloxifene with calcium and vitamin D    | 2               |
| Raloxifene with bisphosphonates          | 1               |
| Calcium and vitamin D supplements only   | 8               |
lifestyle changes and 33 patients (50.77%) replied that their pharmacist provided information on the drugs prescribed and dispensed (Figure 1). No statistical significance was found between patient knowledge and risk factors and between bone density results and treatment prescribed.

In the second questionnaire directed towards HCPs, 13 male HCPs participated in the study: 10 gynaecologists and 3 rheumatologists. When 9 clinical scenarios suggested by NICE guidelines were presented to HCPs, they agreed to refer patients for DEXA scanning in 75% of the cases (Table 2).

When presented with 10 different clinical cases, bisphosphonates were chosen as the main drugs of choice. This was followed by raloxifene and hormone replacement therapy (HRT). Management issues about osteoporosis were divided into two parts. In the first part HCPs graded 6 management issues according to their importance, giving most importance to the dietary intake of calcium and vitamin D, followed by exercise and need for a balanced diet whilst least importance was given to smoking cessation and alcohol intake. In the second part of management issues 12 HCPs (92%) recommended calcium and vitamin D supplements to all patients and this was followed by another recommendation that treatment should be long term (10 HCPs (77%) agreed). All HCPs agreed that timeframe between 2 repeated bone mineral density scan should be between 1-2 years. HCPs agreed that patients on long-term corticosteroids should be monitored for osteoporosis with 9 HCPs (69%) agreeing that patients should be referred for Dual Energetic X-ray Absorptiometry (DEXA) scanning every 2 years and that corticosteroid therapy is scheduled for more than 3 months. In the case of patients on corticosteroid therapy, who develop osteoporosis, 10 HCPs (77%) agreed that bisphosphonates should be the first line treatment. All HCPs reported that they discuss disease with their patients and that they discuss treatment and provide information about the drug chosen. Only 5 HCPs (38%) would recommend biochemical marker testing in patients to aid in diagnosis of osteoporosis and to monitor progression when patients receive treatment.

**DISCUSSION:**

Locally, most of the patients participating in this study were females: their menopause reflecting fact that most patients referred for bone mineral density scanning are post-menopausal women. Bone mineral density in males should be emphasised more because less importance is given to males. As a result cases of osteoporosis are being missed. Most risk factors found amongst patients modifiable risk factors. These risk factors can easily be improved if the patients are made aware and educated about the necessary prevention methods including exercise, sun exposure and appropriate diet.

Similar to other studies conducted in Scotland (Spencer 2006), India (Kani et al, 2005), Tur
(Mehmet et al, 2001) and Australia (Fendin, 2003), patient knowledge was found to be low (51%) and most patients are not aware of the risk factors and have poor knowledge on the condition. The fact that these answers were provided by patients who are receiving treatment for this condition implies that further information is required for the patients so as to empower them with knowledge about their condition.

Results of the bone density scans showed that most patients were osteoporotic at the lumbar/vertebral level, with few patients suffering from osteoporosis at the hip level. NICE guidelines suggest that these patients should still be considered as osteoporotic and be treated. Some false positive results were obtained due to osteoarthritis. Similar to the situation in other countries dual energy X-ray absorptiometry is still considered as the golden standard for assessment of bone mineral density with the T score considered as the main parameter to diagnose osteoporosis (Australian and New Zealand Horizon Scanning Network, 2007).

Most patients were treated with bisphosphonates, which are the drugs of choice. This is now doubt due to the experience and data gathered over many years’ use. Although guidelines suggest that bisphosphonates should be taken with calcium and vitamin D supplements not all patients followed this practise (9 patients). A small number of patients were on a combination of two bisphosphonates (4 patients). The use of a combination of bisphosphonates is questionable and a burden from both a pharmaco-economic view for the patients. However, some studies showed that a combination of two bisphosphonates may produce a better effect and a higher increase in bone mineral density than either agent alone (Rabenda et al, 2005). The use of strontium ranelate was quite high in accordance with NICE guidelines suggesting that strontium ranelate can be used as an alternative to bisphosphonates. A small number of patients were taking raloxifene (4 patients) in differ combinations: alone (one patient), with calci and vitamin D supplements (2 patients) or v bisphosphonates (one patient). Only a sn number of patients were using horm replacement therapy (HRT). This reflects HRT is not the drug of choice in the treatment osteoporosis. A large number of the patients w taking a combination of calcium and vitamir supplements. Some patients were taking th supplements alone for treatment of osteopor (n=8), others were taking them with a combinat of bisphosphonates (n=19), some with stronti ranelate (n=7) and some with raloxifene. The of these supplements should be emphasized w patients have a poor dietary intake. The pati should be monitored for any signs of hy calcaemia and hypercalcuciria especially when t are using vitamin D supplements.

Patients on long-term oral corticosteroids hav higher risk of developing osteoporosis. Th patients should be given preventive therapy osteoporosis so that any side-effects are minimiz Oral corticosteroids increase fractures even at dc of less than 7.5mg of per day (Royal College Physicians of London, 2002). Treatment should given as prevention therapy and as treatment established osteoporosis. If the patient had three four courses of corticosteroids in a year, he/she n still be treated for prevention as this is equiva len three months of corticosteroid therapy. The Rc college of Physicians of London (RCP) recomm that osteoporosis prophylaxis in patients recev steroids should be started if the T-score is -1.5 less. Treatment may be considered if the patient to wait for long for DEXA scanning.

Although local HCPs agreed to monitor all patic on long term corticosteroids, (n=13) not all agr to prescribe treatment for prophylaxis (n=7). W HCPs were questioned about patients below age of 65 a number agreed to monitor this gr for osteoporosis (n=9). Although guidelines, s that there is evidence that the best first l

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treatment in corticosteroid induced osteoporosis is bisphosphonates not all HCPs were in agreement with this (n=10). The results showed that HCPs follow the guidelines in most of the issues except in the choice of preventive treatment prescribed in patients on corticosteroids.

The results also show that treatment was usually only indicated when patients were diagnosed as osteoporotic. This may be because many patients would not understand the use of preventive treatment and as a result would not comply with the suggestions of the HCP. Another contributing issue is that these drugs are expensive and are not covered by the national health scheme, thus not all the patients can afford to buy them regularly. Pharmacists together with other HCPs should therefore be encouraged to inform patients of the benefits of preventive treatment.

Communication with the patient is essential for building a strong patient-health care professional relationship. All HCPs agreed that they should discuss treatment options with their patients (n=13). However, patient knowledge seems to be very low suggesting that discussion alone is not so effective. Leaflets, meetings and health promotion initiatives through the media may have a better impact on the patients especially when these are visual. Meetings and discussions are now held regularly by the Malta Osteoporotic Society to help all those interested in learning more about this disease.

The pharmacist may serve as a means of communication between the patient and the health care professional and help in the education of the patients. As osteoporosis is a silent disease only a small number of patients seem to realize the consequences that can result. This may be a reason for the poor therapy compliance as the patient does not see or feel any changes unless fracturing occurs. All health care professionals should work together to emphasize the importance of lifestyle changes and to treat when necessary to decrease morbidity and mortality.

The pharmacist also has an important role discussing with other health care professionals best treatment for the patients. The pharmacist and all other health care professionals must regularly update and follow guidelines so maximum effectiveness is achieved. The pharmacist must also provide all the necessary information during dispensing and answer all queries of the patient.

CONCLUSION
Although osteoporosis is achieving wider recognition, more needs to be done with regard to health promotion and awareness. This study shown that education can be the key to improving the current situation in Malta especially in patients who are being treated but have poor knowledge about the disease. Furthermore, educating children in schools and emphasizing the importance of exercise and calcium and vitamin D at a young age would help future generations to attain a high peak bone mass density and thus lessen the risk of future disease. Discussions and national health campaigns should be encouraged to increase awareness of the disease and the health care professionals should continue to work as a team to ensure that patients are treated holistically ensuring maximum benefit.

Osteoporosis is a silent disease and sometime is more difficult for patients to understand complications and the progression of the disease. The pharmacist should act as a bridge between patient and the health care professional and ready to answer more of the needs of the patient.

DECLARATION OF INTEREST
The authors have no conflict of interest and receive no financial assistance for this research.

REFERENCES
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