ORIGINAL ARTICLE

Osteoporosis prophylaxis during corticosteroid treatment: failure to prescribe

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Aims: To investigate prescribing patterns to prevent steroid induced osteoporosis. To compare prophylactic prescribing with National Osteoporosis Society (NOS) guidelines.

Method: All patients (n=92) taking oral corticosteroids admitted to general medical wards at a district general hospital were prospectively investigated over a nine month period.

Results: Variations from recommended management were revealed. Altogether 64.7% of all inpatients who qualified for prophylaxis for steroid induced osteoporosis were not provided with any suitable agent. It was also found that 21.6% of those who qualified for treatment received a bisphosphonate, the only treatment currently licensed for preventing steroid induced osteoporosis. Of those prescribed prophylactic treatment, a bisphosphonate was selected for 39.3%, hormone replacement therapy was given to 25.0%, and 35.7% received treatment that is not recommended in NOS guidelines.

Conclusion: This study revealed substantial variations from NOS guidelines. It is suggested that osteoporosis prophylaxis during steroid treatment is promoted by local hospital guidelines, hospital and community pharmacists, audit, and general practitioners.

Bisphosphonates can decrease the risk of fractures in osteoporotic bone caused by oral corticosteroids.^{1,2} It might have been expected that improved management would follow publication of reports of inadequate primary prophylaxis³ and subsequent prescribing guidelines.^{4,5} Continuation of suboptimal primary prevention may occur for several reasons. These include lack of adherence to National Osteoporosis Society (NOS) guidelines, lack of patient compliance, adverse drug reactions, or failure to anticipate the length of treatment at the beginning of a corticosteroid course. It is during the first year of treatment that bone loss is most rapid.³ The aim of this study was to assess compliance in relation to NOS guidelines.⁵

METHOD

A prospective study was made during the inpatient stay of all general medical patients (n=92) prescribed oral corticosteroids at a district general hospital. A short questionnaire was completed after interviewing each inpatient and inspecting their hospital notes. Current dosage, total previous steroid exposure, and the longest single continuous course of steroids were established. Other common risk factors for osteoporosis were noted: family history, being post-menopausal, alcohol consumption exceeding 30 units per week, and smoking for more than 10 years. Patients were judged to qualify for prophylaxis against steroid induced osteoporosis if they were taking prednisolone continuously for more than six months and fulfilled the criteria specified in the guidelines.⁵

Effective prophylaxis for steroid induced osteoporosis was defined as a bisphosphonate or, in specific circumstances, hormone replacement therapy (HRT).⁵ The drugs chosen and the doses used for osteoporosis prophylaxis were recorded during interviews and from the patients' drug charts. The notes were inspected to discover whether osteoporosis had been confirmed on a densitometry scan or osteopenia had been judged to be shown on an x ray film. The underlying reason for treatment with steroids was recorded.

RESULTS

Ninety two inpatients were identified between 1 January and 1 September 1999; there were 56 women and 36 men. The

mean age was 72.0 years (SD = 14.1) and the age range 25–94 years. Fifty one patients qualified for primary prophylaxis according to the NOS guidelines.⁵ Only 18 patients (35.3%) were receiving effective prophylaxis against steroid induced osteoporosis. Eleven patients were taking bisphosphonates and seven HRT. Ten patients receiving long term steroids were taking inadequate osteoporosis prophylaxis: three were taking vitamin D plus calcium, two were taking vitamin D (without calcium), and five were taking only calcium supplements. Three patients had previously been taking a bisphosphonate which had been stopped due to poor compliance or intolerance and were not taking any alternative treatment.

Of the 51 patients who qualified for prophylaxis, the mean total exposure was 34 755 mg of prednisolone. The average duration of continuous exposure to steroids was 7.0 years, the longest being 35 years. Four of these patients had received a continuous course for less than six months, although a course exceeding six months had been planned for each of them.

Six patients who did not qualify had been prescribed prophylaxis and three of these were taking a bisphosphonate. Eight patients had bone densitometry scans confirming osteoporosis and seven of these were receiving prophylaxis. Of these eight patients, only two would have qualified for prophylaxis according to their steroid exposure alone. Radiographs are a poor indicator of osteoporosis but 10 other patients had been judged osteopenic by this method and eight of these were taking prophylaxis.

The distribution of conditions treated with steroids is shown in table 1.

DISCUSSION

Our results demonstrated that many hospital patients (64.7%) who should have been receiving treatment to prevent steroid induced osteoporosis were not prescribed effective prophylaxis. For this study, effective prophylaxis included bisphosphonates or HRT. Other medications including vitamin D plus

Abbreviations: HRT, hormone replacement therapy; NOS, National Osteoporosis Society

Table 1 Distribution of conditions treated with steroids

Condition requiring steroids	No of patients (n=92)	No of patients qualifying for prophylaxis (n=51)
Chronic obstructive pulmonary disease	41	21
Polymyalgia rheumatica/temporal arteritis	25	9
Rheumatological connective tissue disorders	15*	14
Ulcerative colitis	2	1
Pemphigoid	2	0
Sarcoidosis	2	2
Myaesthesia gravis	1	1
Idiopathic thrombocytopenic purpura	1	0
Neoplasia	1	1
Hepatitis	1	1
Detached retina	1	1

*Including 12 with rheumatoid arthritis.

calcium, calcium alone, vitamin D alone, and calcitonin have been appraised prospectively but found only to prevent bone loss in the lumbar spine and not to reduce fracture rate. Bisphosphonates are the drugs of choice for prophylaxis during steroid administration and HRT has been recommended in special circumstances.⁵ Only 11 out of 51 patients who qualified for prophylaxis were prescribed a bisphosphonate. Three patients were taking vitamin D plus calcium; this is recommended for osteoporotic patients whose diet is likely to be deficient or for high risk groups but not specifically recommended for steroid induced osteoporosis.⁵ Only one of those taking vitamin D plus calcium had previously taken a bisphosphonate and another was relatively young.

There may be a number of reasons why patients did not take the prophylactic treatment of choice, cyclical bisphosphonates. Firstly, the NOS guidelines recommend that patients continue to take HRT if they subsequently start long term corticosteroids; this applied to seven patients. A second reason is that bisphosphonates are sometimes unsuitable for elderly patients who may lack the understanding to comply with the complicated regimen. Another reason is that the more elderly patients may have considered prophylactic treatment unnecessary at their great age—the average age of our patients was 72 years. Alternatively, physicians in this study may have failed to provide prophylaxis for several reasons. Firstly, they may have failed to predict a prolonged steroid course. Secondly, they may have failed to prescribe prophylaxis in anticipation when long term steroids were started. This may have occurred because physicians may have been unfamiliar with local guidelines or current literature or there may have been discontinuity of patient follow up and hence failure to intervene with prophylaxis when patients were reviewed or admitted while taking long term steroids. Finally, NOS guidelines had been published but had not been specifically publicised in this hospital and although local guidelines had been produced, they had not been widely circulated.

Only one patient with a bone densitometry scan indicating osteoporosis had not been given prophylaxis but this scan result had only just become available. In this study of patients taking steroids, three underlying conditions accounted for 82% of those eligible for prophylaxis: pulmonary airway diseases, polymyalgia rheumatica/temporal arteritis, and rheumatological connective tissue disorders.

For our patients, appropriate prophylaxis was given to 35.3%. Others have found even lower levels of implementation: 14% in one survey and 8% in another.^{6,7} However, our study may well have underestimated failure to prescribe prophylactic treatment since we did not look for prevalent osteoporotic fractures, which are an additional indication for prophylaxis.³ In the absence of large scale prospective controlled trials, the threshold for starting prophylaxis remains controversial. Some advocate prophylaxis if steroid treatment is continued for more than a “few weeks”.¹ There is increasing consensus that taking or planning to take 7.5 mg of prednisolone daily for six months requires a plan of prescription for prophylaxis.^{4,5,8} We believe that for optimal patient care, prophylactic prescribing of osteoporotic protective drugs should be considered simultaneously with the introduction of long term steroid treatment, as suggested by the NOS guidelines. We suggest this may be promoted best by local hospital guidelines, hospital and community pharmacists, audit, and medical education.

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REFERENCES

- 1 **Adachi JD**, Bensen WG, Brown J, *et al*. Intermittent etidronate therapy to prevent corticosteroid-induced osteoporosis. *N Engl J Med* 1997;**337**:382–7.
- 2 **Saag K**, Emkey R, Schnitzer T, *et al*. Alendronate for the prevention and treatment of glucocorticoid-induced osteoporosis. *N Engl J Med* 1998;**339**:292–9.
- 3 **Sambrook P**, Birmingham J, Kempler S, *et al*. Corticosteroid effects on proximal femur bone loss. *J Bone Miner Res* 1990;**5**:1211–16.
- 4 **Eastell R**, Reid DM, Compston J, *et al*. A UK consensus group on management of glucocorticoid-induced osteoporosis: an update. *J Intern Med* 1998;**244**:271–92.
- 5 **National Osteoporosis Society**. *Guidance on the prevention and management of corticosteroid-induced osteoporosis*. London: NOS, 1998.
- 6 **Walsh LJ**, Wong CA, Pringle M, *et al*. Use of oral corticosteroids in the community: a cross sectional study. *BMJ* 1996;**313**:344–6.
- 7 **Peat ID**, Healy S, Reid D, *et al*. Prevention of steroid induced osteoporosis. A missed opportunity? *J Rheum Dis* 1995;**54**:66–8.
- 8 **Stevenson JC**. Management of corticosteroid-induced osteoporosis. *Lancet* 1998;**352**:1327–9.