

A clinic for the prevention of osteoporosis in general practice

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SUMMARY. A clinic for women aged 40–60 years, offering screening and education about diet and hormone use and other measures for the prevention of osteoporosis, was organized in a group practice. Out of 582 eligible women contacted from the age–sex register, 252 (43%) attended the clinic. A year after the start of the clinic postal questionnaires were sent to all attenders and non-attenders to ascertain smoking habit, hormone use, calcium intake and social class. The use of hormone replacement therapy by the clinic attenders increased from a baseline of 15% to 45% but this had decreased to 38% one year later. Attending women were of higher social class and had slightly higher calcium intake than non-attenders. Although the use of hormone replacement therapy for prevention of osteoporosis is controversial, the risks and benefits were explained carefully to the women and the clinic provided a valuable opportunity for screening for weight problems, high blood pressure, menstrual problems and for health education about diet for the woman and her family.

Introduction

OVER 46 000 fractures of the hip occur in the UK each year and the majority are in elderly women.¹ The importance of osteoporosis in causing these has been confirmed by Cooper and colleagues who showed that particularly before the age of 75 years, the risk of fractures is related to loss of bone density.² The treatment of established osteoporosis is expensive and often unsuccessful. However, prevention is possible if oestrogen is given at or after the menopause and epidemiological studies by Weiss³ and the Framingham study⁴ have shown that the risk of fractures in oestrogen users is 40–60% of the rate in non-users.

Oestrogen therapy for prevention of osteoporosis

Short term hormone therapy offers no advantage for preventive health. Oestrogen therapy for five to six years around the time of the menopause has been shown to be effective in protecting against fractures and possibly in preventing heart disease.^{4,5} Women who have their ovaries removed when young may need oestrogen for 15, 20, 25 years or longer.

The use of oestrogen at the menopause is controversial. It is generally accepted that castrated pre-menopausal women who have no contraindications should receive oestrogen replacement therapy. The routine medication of healthy women is more debatable. These women have a probable life span of nearly 80 years and there is no evidence that hormone replacement therapy will increase this. However, it is important to preserve their independence and quality of life. Many are living alone and need to stay mobile and healthy as long as possible.

Contraindications to therapy include carcinoma of the breast and body of the uterus, malignant melanoma, severe liver and kidney disease and present risk of major thromboembolism as in hip replacement surgery or auricular fibrillation.⁶

Four cohort studies, one very recent,^{7–10} have confirmed that oestrogen use increases the risk of breast cancer and this risk increases with the duration of therapy. Deaths from breast cancer have not been increased in oestrogen users but it may be that patients need to be followed up for longer periods before this can be ascertained. The consensus is that use of hormone replacement therapy for less than 10 years does not increase the risk,¹¹ although the figure of six years may be better as the limit of safe use as regards breast cancer, following the Swedish findings.¹⁰ Most of the evidence comes from the United States of America where conjugated equine oestrogens have been used for over 40 years.

Oestrogen used alone in hysterectomized women increases levels of high density lipoprotein, lowers total cholesterol levels¹² and reduces the risk of dying from coronary heart disease.⁵ There is little doubt that hysterectomized women benefit from the reduction in risk of fractures and heart disease from the use of unopposed oestrogen and for them the advantages probably outweigh the disadvantage of increased risk of breast cancer.¹¹

Women with a uterus are in a different situation. If they are given oestrogen alone the risk of endometrial cancer is increased four to eight fold after five years¹³ but if progestogens are used in conjunction this risk is not increased.¹⁴ Progestogens also have a beneficial effect on bone density.¹⁵ Hormone replacement therapy for women with a uterus therefore includes progestogen for 10–13 days each month. However, there are disadvantages to adding progestogens to the therapy for these women: progestogens cause adverse changes in blood lipids and may increase the risk of heart disease;¹² they may partly nullify the beneficial effect of oestrogen on lipids and heart disease; and women must accept cyclical bleeding when progestogen is withdrawn and this is a major reason why many women decide not to use hormone therapy. Progestogen does not give protection from breast cancer.¹⁰ Many women experience 'premenstrual syndrome' with bloating and irritability during the progestogen therapy.

There is little evidence that calcium supplements prevent bone loss at the time of the menopause but it has been shown that they slow post-menopausal bone loss.¹⁶ Although a recent comprehensive review concluded that calcium supplementation for menopausal women is not justified on present evidence,^{16,17} a prospective study in Californian women aged 50–79 years showed an inverse association between dietary calcium and subsequent risk of hip fracture.¹⁸ A case control study of patients with hip fractures in Hong Kong also showed that adequate calcium intake protected against fractures.¹⁹

Other factors associated with osteoporotic fractures include heavy smoking,²⁰ slim build, positive family history,²¹ lack of exercise,²² lack of exposure to ultraviolet light²³ and heavy alcohol consumption.²⁴ Apart from genetic factors such as family history and slim build these are all remediable.

An osteoporosis prevention clinic

Screening for rapid bone loss cannot yet be applied to the general population and bone density measurement at the menopause

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is expensive and is available only to a tiny minority of women at risk of osteoporosis. Our practice in Bollington, Cheshire, decided to contact all women on the practice list who were menopausal and to embark on a programme of health education and screening, and prescription of hormone replacement therapy for as many women as possible of all social classes, for whom it could be regarded as safe and acceptable.

The practice has five partners and a list size of 8600. The age-sex register was used to identify women aged between 40 and 60 years, and all 1200 were contacted by a letter asking them to attend the clinic, in batches of 16 patients. The age groups nearest to 50 years were contacted first. These women would be most at risk of rapid bone loss and might be more motivated to attend than those in younger or older groups.

The clinic was held each week in the two hours of the lunch break on surgery premises. The letter explained the purpose of the clinic and asked women who could not attend on the day of the appointment to come at a later date. All the clinics were identical in format and a woman would attend once only during a period of two years.

Clinic protocol

When the patients attended the clinic a secretary obtained their notes and ensured that each had had a cervical smear during the past three years. She also attached an adhesive strip to the record card so that various items could be recorded.

The doctor gave a five minute informal talk to the group of attenders to explain the meaning of osteoporosis and how it could be prevented. For each patient the nurse then recorded exposure to ultraviolet light (on holidays or with sunlamps), smoking (number of cigarettes daily), exercise (type and frequency), weight (kg), height (m) and blood pressure (mm Hg) and tested urine with a dipstick for albumen and glucose. The other patients meanwhile collected educational leaflets from the nurse and held a discussion. Recently the clinic was modified to include cholesterol measurement by the Reflotron method in high risk patients (those with angina, heavy smoking, or a family history of early cardiac death). Patients with a cholesterol level over 7.0 mM were referred to the cholesterol management clinic within the practice for strict dietary supervision. Prescription of cholesterol lowering drugs was reserved for those with cholesterol persistently over 7.5 mM, who did not respond to dietary regimens.

Each woman had an individual consultation with the doctor who recorded her previous history and whether the ovaries had been removed, her calcium intake (mg daily estimated from dietary history and nutritional tables), alcohol intake (units per week) and whether she was currently taking hormone therapy. The record card was examined for possible contraindications to hormone therapy. The doctor also looked for increased risk factors for osteoporosis such as: early menopause; thin, slight build; white ethnic origin; low mobility; low calcium diet; smoking habit; corticosteroids.

A menstrual history was taken, including date of last menstrual period, and heavy, irregular or postmenopausal bleeding was referred for diagnostic curettage. Breast and pelvic examinations were carried out when time allowed and patients with lumps in breast or pelvis were referred and were not considered for hormone replacement therapy until investigation had excluded any malignancy. Mammography was discussed with each patient, and many arranged it privately as there was at that time no local access to this type of screening on the National Health Service.

Women who were unable or unwilling to take hormone replacement therapy were urged to increase calcium intake to over 1300 mg daily, as recommended by the report of the Royal

College of Physicians.¹ For those on hormone replacement therapy, 800 mg daily calcium was suggested. The women were advised how to achieve this, mainly by the use of low fat dairy products. Those who could not take milk were recommended to buy calcium supplements over the counter. The doctor did not encourage them to take oral vitamin D supplements as there is no evidence that these are effective.²⁵ All patients were asked to stop smoking and the role of cigarettes in lowering the level of circulating oestrogen²⁰ and increasing the risk of fractures was explained.²¹ Heavy drinkers were encouraged to limit consumption of alcohol to less than 14 units weekly. Patients were encouraged to take regular exercise. Any problems detected, such as high blood pressure, abnormal urine test, abnormal bleeding patterns or high or low weight were channelled to appropriate clinics or ordinary surgery appointments. High blood pressure when controlled was not regarded as a contraindication to therapy. Women were discouraged from embarking on rapid slimming diets and it was explained that after the menopause the level of circulating oestrogen will depend on the amount of body fat.²⁶ All were shown the charts which relate ideal body weight to height so that they could aim at a weight within the normal range. All women were given advice on nutrition by the doctor and advised to reduce meat and dairy fats, and to buy mostly fish, fruit and vegetables, low fat dairy products and cereals. The nurse advised on stopping smoking.

No attempt was made to pressurize patients into taking hormone therapy. The doctor explained the advantages and disadvantages of treatment and the different types of therapy. The decision to embark on therapy was made by patient and doctor together. Only in those with very early menopause or a family history of osteoporosis was there further encouragement to take treatment.

After the record was completed and they had seen the doctor the women were shown a video film about osteoporosis and many stayed behind to discuss the topic. Each month a physiotherapist held a class in exercise to strengthen the back and improve the posture.

Follow up

Hormone users were routinely followed up three months after the first prescription and thereafter at intervals of six months to a year. Bleeding pattern and blood pressure were monitored and any side effects recorded. Cases of unscheduled bleeding were referred for investigation and the prescription could be altered or stopped. Women who stopped hormone replacement therapy were questioned at their next surgery attendance as to why they had stopped. Pressure to continue therapy was not applied by the doctor except in those rare cases of castrated women who had stopped therapy without any contraindication to treatment having arisen.

Cost

The cost per month to the practice for this clinic was as follows: nurse's salary £15 allowing for 70% reimbursement; secretary's salary £20; postage £8; stationery £2; physiotherapist £8; total £53. The cost of the clinic was kept low owing to the 70% reimbursement of the nurse's salary and the absorption of overheads in the running expenses of the practice.

Audit of the clinic

Between January and December 1988, 582 women, half the 40-60 year old cohort, had been offered an appointment at the clinic; 252 attended, giving an attendance rate of 43%.

Between December 1988 and January 1989 all attenders and

non-attenders were sent a postal questionnaire designed to ascertain the following: smoking habit, calcium intake from dietary recall, present hormone use and husband's or own occupation. The social class of each respondent was found by reference to the registrar general's classification according to occupation. Replies were received from 180 of the clinic attenders (71%). Only 156 of the non attenders responded so between September and October 1989 information was sought about the remaining 174 non-attenders. The same information, except for estimates of calcium intake, was obtained from their medical records or, where this information was not available, by telephone or letter. Data were eventually obtained for 282 (85%) of the non-attenders.

Table 1 compares data obtained from attenders at the time of the clinic, attenders who responded to the questionnaire at one year follow up, and non-attenders.

Demographic data

The mean age and range of ages was similar for attenders and non-attenders. Figure 1 shows that a much higher proportion of clinic attenders were in social classes 1 and 2 than were non-attenders.

Smoking

The smoking records showed that only a low proportion of clinic attenders smoked initially (16%), and that this decreased slightly at one year follow up (14%). A higher proportion of the non-attenders were smokers (27%) (Table 1).

Calcium intake

Calcium intake in the clinic attenders increased slightly between baseline and the one year follow up (mean of 757 mg daily at baseline to 791 mg daily). In non-attenders who responded to the questionnaire the calcium intake was estimated at 676 mg daily (Table 1).

Hormone use and compliance

Before the clinic started, hormone use in the whole practice population of women aged 40–60 years was 7%. Fifteen per cent of the clinic attenders were already using hormone replacement

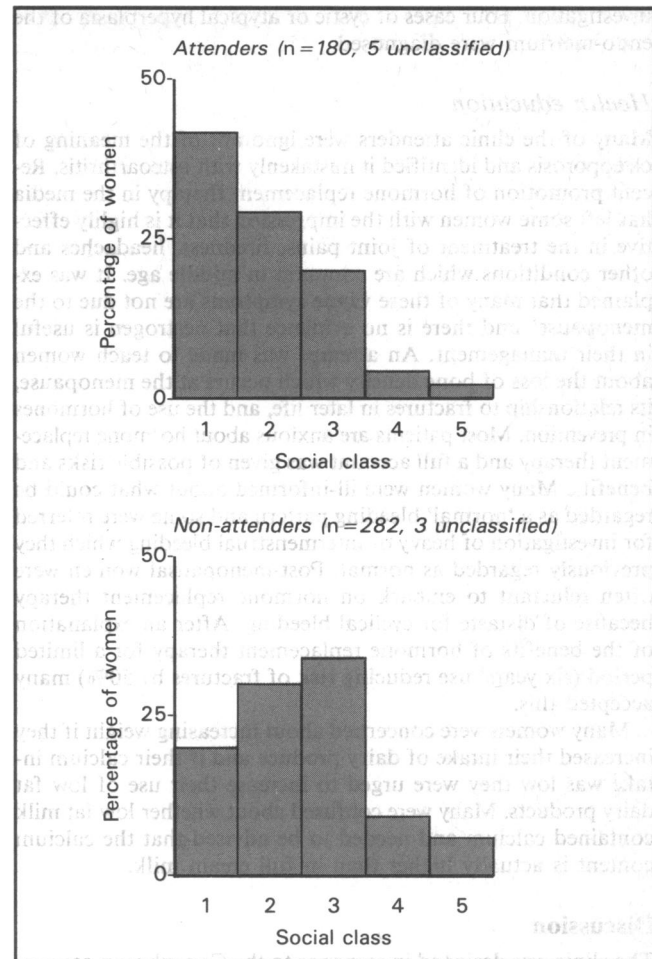


Figure 1. Social class distribution of attenders and non-attenders at the clinic.

Table 1. Comparison of attenders and non-attenders at the clinic.

	Attenders		Non-attenders (n = 282)
	Initial data (n = 252)	One year follow-up (n = 180)	
<i>Age (years)</i>			
Mean	50.1	50.1	50.9
Range	38–61	38–61	41–57
<i>Smoking</i>			
Number (%) of smokers	42 (16)	26 (14)	75 (27)
Range of number of cigarettes daily	1–40	3–30	2–40
<i>Calcium intake (mg daily)</i>			
Mean (SD)	757 (270)	791 (358)	676 (394) ^a
Range	200–1430	100–2000	79–2950
<i>Hormone replacement therapy</i>			
Number (%) of users	39 (15)	69 (38)	38 (13)

SD = standard deviation. n = total number respondents.

^aBased on 156 who responded to questionnaire.

therapy. At the clinic 114 (45%) of them were prescribed hormone replacement therapy but at the one year follow up only 38% of those contacted were still taking therapy. Thirteen per cent of non-attenders were using hormone replacement therapy.

Women who had stopped taking the hormones at one year follow up gave their reasons as reluctance to accept periods, or worry about cancer and the feeling that hormone replacement therapy was 'not natural'. The commonly noted side-effects were premenstrual syndrome — headache, bloating and mild depression — while on progestogen, and weight gain due to fluid retention. This was treated with diuretics. Two patients experienced cramps. The bleeding pattern was nearly always regular and predictable at the end of each calendar pack or on day one to three of the following pack. One woman was withdrawn from therapy because of a lump in the breast (benign) and four because of bleeding due to cystic hyperplasia. One developed a malignant melanoma and therapy has been discontinued. Patients' reasons for discontinuing therapy without informing the doctor were: 'I felt no better' or 'the periods are a nuisance'. Some were obviously anxious about risks and side effects.

Screening

No major pathology was detected at the clinic although heavy drinking and smoking were recorded. However, on initial screening before hormone use 15 women were found to have abnormal bleeding or uterine enlargement and were referred for

investigation. Four cases of cystic or atypical hyperplasia of the endo-metrium were diagnosed.

Health education

Many of the clinic attenders were ignorant of the meaning of osteoporosis and identified it mistakenly with osteoarthritis. Recent promotion of hormone replacement therapy in the media has left some women with the impression that it is highly effective in the treatment of joint pains, tiredness, headaches and other conditions which are common in middle age. It was explained that many of these vague symptoms are not due to the menopause⁶ and there is no evidence that oestrogen is useful in their management. An attempt was made to teach women about the loss of bone density which occurs at the menopause, its relationship to fractures in later life, and the use of hormones in prevention. Most patients are anxious about hormone replacement therapy and a full account was given of possible risks and benefits. Many women were ill-informed about what could be regarded as a 'normal' bleeding pattern and some were referred for investigation of heavy or intermenstrual bleeding which they previously regarded as normal. Post-menopausal women were often reluctant to embark on hormone replacement therapy because of distaste for cyclical bleeding. After an explanation of the benefits of hormone replacement therapy for a limited period (six years' use reducing risk of fractures by 50%) many accepted this.

Many women were concerned about increasing weight if they increased their intake of dairy produce and if their calcium intake was low they were urged to increase their use of low fat dairy products. Many were confused about whether low fat milk contained calcium and needed to be advised that the calcium content is actually higher than in full cream milk.

Discussion

The clinic was designed in response to the Copenhagen consensus conference in October 1987 on prophylaxis and treatment of osteoporosis.²⁷ Women of all social classes were contacted in the hope of attracting women of lower social class and education who were less likely to be aware of the importance of hormone replacement therapy in prevention of osteoporosis. Unfortunately the clinic attenders were biased towards the higher social classes compared with non-attenders.

The attendance rate of 43% was low but could be attributed to the fact that nearly all these women were in full-time paid employment. In addition they had many family responsibilities and were often caring for aged parents. Some women came to the clinic at the second or third attempt and others arranged to attend at a later date. We intend to contact the non-attenders again in 1990 in addition to the new cohort of those born in 1948 to 1950 who will join the group of 40–60 year olds.

An initial uptake of hormone replacement therapy in 45% of clinic attenders had fallen to 38% at the 12 monthly audit. This compares favourably with other specialist hormone replacement therapy clinics (personal communication).

Cigarette smoking among attenders at the clinic was slightly lower than that of non-attenders. The rate of smoking in our women patients is already lower than the national average and further improvement is slow; during the past 15 years a major educational effort has been offered through our practice nurses and the coronary prevention clinic.

The mean intake of nearly 800 mg calcium daily in clinic attenders is regarded as satisfactory after recent published evidence about prevention of femoral fracture.^{18,19} The recorded levels were probably under-estimated owing to the omission of many minor sources in the dietary history. Calcium intake was increas-

ed slightly after attendance at the clinic and was higher in attenders than non-attenders.

In addition to educating the clinic attenders about osteoporosis, and screening for social health problems, we tried to educate the women, as the principal shoppers and cooks for their families, about the importance of eating fish and vegetables, a low intake of animal fat and adequate calcium for children. Growing bones are more responsive to calcium intake than in later life and a high peak bone mass will probably offer protection against fractures.²⁸ Current fashions in soft drinks, alcohol and coffee for teenagers need to be challenged by the provision of bread and dairy products as sources of calcium.

We do not envisage prescribing hormone therapy for all menopausal women and this would not be a practical proposition. But all women should have access to education and screening and supervised prescription of hormone replacement therapy if they wish it and the doctor believes it would be advantageous for that particular patient.²⁹ This clinic is popular with patients and has already demonstrated the feasibility of the project. It offers a new kind of preventive care in the community.³⁰

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