The effectiveness of blood tests in detecting secondary osteoporosis or mimicking conditions in postmenopausal women

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SUMMARY

The National Service Framework for Older People requires a reduction in the number of falls that result in serious injury. Those most at risk need to be identified, investigated in line with the Royal College of Physicians Clinical Guidelines and receive appropriate treatment. This report looks at the results of investigation of postmenopausal women diagnosed as having osteoporosis in primary care by forearm Dexa scanner (DTX200) and questions whether the investigations suggested within the National Service Framework are justifiable. Scans were performed on 699 postmenopausal women aged 54 or over, resulting in a new diagnosis of osteoporosis in 173 women. Complete blood tests were performed in 107 of the newly diagnosed patients. Only three of these patients (2.8%) had blood test results that revealed a potential secondary cause. The rates of positive findings are low; further research is needed to see if they are justified in postmenopausal women.

Keywords: osteoporosis; postmenopausal women; blood tests.

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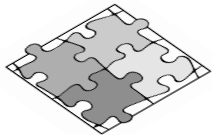
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Introduction

THE National Service Framework for Older People, within Standard 6 (on falls) sets out how a multidisciplinary approach to osteoporosis should be put in place. By April 2004, there should be Health Improvement Plans which include an integrated 'falls' service and this service should be implemented by April 2005.[1] It recommends following the management plans within the Royal College of Physicians Guidelines.[2,3] These guidelines suggest that patients at high risk of osteoporosis should have specific secondary causes, and other conditions that mimic osteoporosis, excluded though a series of blood screening tests. The National Osteoporosis Society[4] has carefully suggested strategies for bone density measurement and implementing therapy in primary care, but has apparently unquestioningly adopted the recommendations for blood testing in the Royal College of Physicians Guidelines. This paper reports the results of these tests when used in practice and asks whether there are sufficient positive findings to justify their use.

The following blood tests are advocated in women:

- FBC (full blood count) to exclude malabsorption;
- ESR (erythrocyte sedimentation rate) to exclude myeloma;
- U+E (urea [creatinine] and electrolytes) to exclude renal osteodystrophy;
- LFT (liver function tests) for alcoholism;
- TFT (thyroid function tests) in case of thyroid disease; and
- Calcium and phosphates, to exclude osteomalacia, hyperparathyroidism, and bony secondaries.[5,6]

The net cost of these, excluding phlebotomy and administrative services, is approximately £22.20 per set. When patients present within a hospital setting, it may be more appropriate for every postmenopausal woman to have a secondary cause for osteoporosis or mimicking condition investigated.

However, with the advent of more readily available Dexa Scanning facilities in primary care, the threshold for measuring bone density will be lowered and, potentially, a different population of postmenopausal patients will be diagnosed. While an extensive literature exists for the relative merits of bone density measurements, no literature was identified using Medline that showed the cost-benefit of routine investigation for secondary cause or mimicking conditions, and none centred around primary care.

HOW THIS FITS IN

What do we know?

Some patients with osteoporosis may
have an underlying cause (secondary osteoporosis).

What does this paper add?

This paper questions the value of adopting secondary care
advice on blood testing for secondary osteoporosis in primary
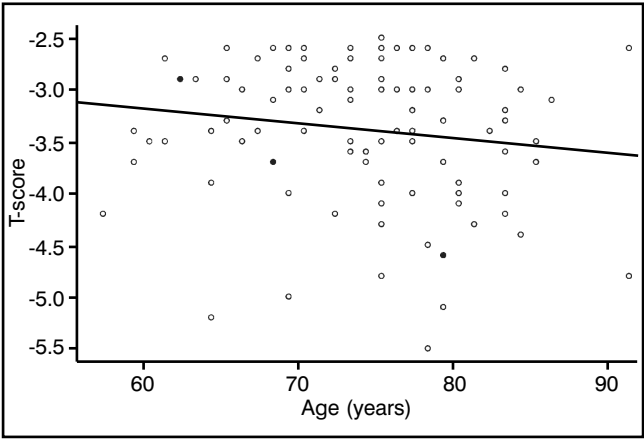care. More research in primary care is needed.

Figure 1. Summary of age versus T-score, with line of best fit.
Patients with secondary causes displayed. Patients with secondary
osteoporosis are represented by solid circles.

Method

During May, June, and July 1997, a forearm Dexa scanner
(DTX 200 osteometer) was loaned to the practice.
Postmenopausal women (age 54 years and over) were
scanned on a self-referral basis via advertisements in the
waiting rooms and repeat prescriptions.

Results were categorised by T-scores according to World
Health Organisation guidelines as follows: normal (T-score
greater than –1.0); osteopenic (T-score range from –1.0 to
–2.5) and osteoporotic (T-score less than –2.5). Those diag-
nosed with osteoporosis were asked to undergo the recom-
mended series of blood tests.

Results

The practice has a list size of 21 000 patients, of which there
are 3089 women aged 54 years and over. Of these women,
699 (22.6%) volunteered to be scanned, of whom 173
(24.7%) were newly diagnosed with osteoporosis and
requested to undergo blood tests. Complete sets of blood
test results were obtained for 107 patients.

The distribution of T-score results for these patients is
shown in Table 1. The age range of the patients tested was
between 57 and 91 years old, with a mean age of 74 years
(standard deviation = 6.99). The T-score results showed
some trend of decreasing T-score with increasing age as
expected (Table 1, Figure 1), although this trend was not sta-
tistically significant.

The blood test results performed on these patients
revealed a secondary cause of osteoporosis in only three
women (2.8% [95% confidence interval = 0 to 5.9%]). The
three secondary diagnoses were parathyroid tumour, coeli-
ac disease, and hyperthyroidism (over-treated hypothy-
roidism). T-score values for these three patients were –2.9,
–3.7, and –4.6 respectively and the ages of these patients
were 62, 68, and 79 years respectively (Figure 1).

Discussion

Of those patients diagnosed with osteoporosis, who attend-
ed blood tests and had a complete set taken, 2.8% had test
results revealing a secondary cause in addition to being
postmenopausal. Our experience suggests that patients in
primary care may not reflect the situation in specialist osteo-
porosis clinics in secondary care, where routine blood tests
appropriate. However a weakness of the study design may
be that those with secondary causes, for example, patients
on cancer chemotherapy and anorexia nervosa, may be less
likely to volunteer to take part in a study, especially if they
are limited in their ability to attend the surgery. Healthy
patients not attending the surgery, who are not on any
repeat medications and without the time to participate, may
also be less likely to participate. Further studies would seek
to overcome these shortcomings.

It would appear from these results that the decision of
whether or not to carry out the additional investigations can-
not be based on the level of the T-score. The three patients
in this study with secondary causes were found to have vary-
ing T-scores. It is therefore unlikely that further investigation
could be selectively carried out on this basis.

The cost-effectiveness of investigating for secondary
causes for osteoporosis and mimicking conditions needs
further research, as not only are the numbers of osteoporot-
ic fractures increasing but also changes in health policy are
encouraging further investigation. Critical appraisal of the
usefulness of routine blood tests should not be forgotten,
simply because they are less expensive than bone density
scans.

Table 1. Distribution of T-score in 107 patients newly diagnosed with osteoporosis, total and by age.

	n	Minimum	Maximum	Mean	SD
Total	107	-5.5	-2.5	-3.4	0.67
Age (years)					
<70	29	-5.2	-2.6	-3.35	0.66
70–79	57	-5.5	-2.5	-3.32	0.69
≥80	21	-4.8	-2.6	-3.55	0.62

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