

Survey of general practitioners' opinions on the role of radiology in patients with low back pain

J PHILIP OWEN

GRAHAM RUTT

MICHAEL J KEIR

HILARY SPENCER

DAVID RICHARDSON

ALISON RICHARDSON

CHRISTINE BARCLAY

SUMMARY. Ninety general practitioners responded to a questionnaire about the role of radiology in patients with low back pain. Their clinical indications for requesting radiographs were mostly in agreement with the opinions of radiologists, but nearly 80% requested investigations for their own or patients' reassurance. Understanding of the terms used by radiologists was good, although 25% thought that acute disc prolapse could be demonstrated on plain films. Previous training in radiology did not seem to influence knowledge. When general practitioners understood radiological terms they had clear therapeutic and specialist referral preferences. Poorly understood terms and those with which they were familiar but unclear about the implications for management were also identified.

Introduction

LOW back pain is a common problem that accounts for between 11.5 and 13.2 million working days lost every year^{1,2} and has an incidence in primary health care of between 11% and 18%.³⁻⁶ It has been estimated that lifetime prevalence rates are as high as 68-70% in men and 61-81% in women.³⁻⁵

Lumbar spine radiology is one of a number of diagnostic aids that doctors use in the management of their patients, giving rise to 5% of all radiographic examinations in NHS hospitals.⁷ In our radiology department lumbar spine radiography accounts for 11.5% of all general practitioner referrals (70 patients per month). Studies in the United States of America⁸ and Denmark³⁻⁵ have shown greater general practice referral rates of 21% and 30% respectively.

The role of plain lumbar spine radiography in patients with back pain is controversial. Some authors have reported positive associations between symptoms and radiological signs⁹⁻¹¹ but others have not.¹² Several studies have questioned the value of lumbar spine radiography in diagnosis and management.^{8,13,14}

J P Owen, FRCR, senior lecturer and honorary consultant radiologist, H Spencer, MRCP, FRCR, senior registrar, D Richardson, FRCR, senior registrar, C Barclay, higher clerical officer, Department of Radiology, Royal Victoria Infirmary, Newcastle upon Tyne. M J Keir, BSc, PhD, principal physicist, Department of Medical Physics, Royal Victoria Infirmary, Newcastle upon Tyne. G Rutt, MRCP and A Richardson, MRCP, general practitioners, Newcastle upon Tyne.
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It is generally agreed that the dose of radiation to patients from lumbar spine radiology is high. Wall and colleagues⁷ showed that mean gonadal doses were 0.58 mGy for men, and nearly 3.8 mGy for women, reflecting greater difficulty in shielding the ovaries. They estimated that radiology of the pelvis and lumbo-sacral spine taken together are the largest contributors (26.5%) to the genetically significant dose from medical radiology.

In any referral for a procedure involving exposure to ionizing radiation, the possible benefit to be gained from the investigation should be weighed against its risks and costs. Despite the weight of evidence that routine plain film lumbo-sacral spine radiographs are of limited value and account for a significant radiation hazard, general practitioners in our area still continue to request them in undiminished numbers. Have clinicians rejected the evidence, are they simply not aware of it, or do they not balance the risks and benefits of these investigations?

In the present study a questionnaire was sent to general practitioners to determine why they requested lumbo-sacral spine radiographs in patients with low back pain; the extent of their understanding of the terms radiologists use in relation to spinal radiographs; and how lumbar spine radiography influences their management of patients (in particular therapy and referrals for specialist opinions).

Method

An initial short pilot study was undertaken in an adjacent health authority (Gateshead) and modifications were made to the questionnaire on the basis of experience gained. All general practitioners on the Newcastle family practitioner committee list who referred patients to the department of radiology at the Royal Victoria Infirmary, Newcastle upon Tyne, were then contacted in a confidential postal survey.

Reasons for requesting radiographs

A series of 11 groups of clinical symptoms and signs (for example backache with reduced straight leg raising) was given and the respondents asked to indicate in each case how likely they were to refer patients for lumbar spine radiology.

Respondents were next asked to indicate if they requested radiographs for patient reassurance or for doctor reassurance and if they carried out spinal manipulation.

Understanding of terms used

A list of seven clinical conditions was given and the respondents asked to indicate which they considered could be identified by plain lumbar spine radiology. Radiologists consider that 'disc prolapse' and 'sciatica' cannot be demonstrated by plain lumbar spine radiographs but that all other alternatives can. Respondents were given a score of +1 for each answer which agreed with accepted radiological usage.

A series of 18 phrases or words from typical radiology reports (for example osteophyte formation or metastatic deposits) was given and respondents were asked to indicate the severity of disease or if they were not familiar with the terminology.

Respondents were asked if they had received formal teaching in radiology as undergraduates, postgraduates or under section 63.

Influence of radiology results on patient management

The same choice of 18 phrases or words as above was offered and the respondents were asked to indicate what action they would take for each. They were given the following alternatives: reassurance only, advise bed rest, give analgaesics, give anti-inflammatory drugs, carry out manipulation, or refer to: orthopaedic surgeon, neurosurgeon, rheumatologist, general physician, other (please specify). Respondents were asked how their referrals for hospital consultant opinions would be affected if an open-access service for lumbar spine x-rays were not available.

Finally, respondents were asked to offer suggestions for improvement of the x-ray service available to them.

Results

Of 177 general practitioners contacted, completed questionnaires were returned by 90 (50.8%).

Reasons for requesting radiographs

Referral patterns for plain lumbar spine radiology in relation to patient's symptoms and signs are illustrated in Figure 1. Backache with significant weight loss was the clinical history which most frequently led to radiology ('almost always' for 78% of respondents) whereas non-recurrent backache for less than

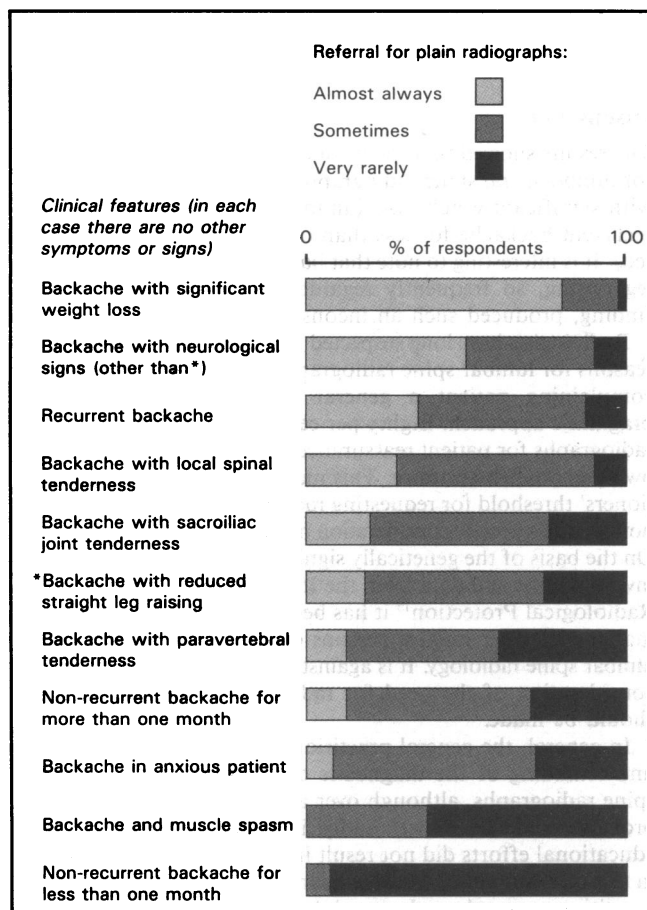


Figure 1. Radiology referral patterns by general practitioners in relation to patient symptoms and signs.

one month was the history that initiated least radiology requests ('very rarely' in 92% of respondents). For other symptoms, notably backache with reduced straight leg raising, there was less agreement about referral.

Of the responding 88% requested radiographs for the sole purpose of reassuring patients while 78% requested radiographs for their own reassurance.

Eight per cent of general practitioners undertook spinal manipulation.

Understanding of terms used

The survey of knowledge of the diagnostic capabilities of plain lumbar spine radiographs showed a good level of understanding among general practitioners (Table 1). However, nearly a quarter thought, incorrectly, that acute disc prolapse could be shown and three respondents felt that sciatica may be identified.

Table 1. General practitioners' understanding of the diagnostic capabilities of spinal radiographs.

Condition	Number of respondents	% believing condition is:	
		Identifiable	Non-identifiable
Vertebral body collapse	90	100.0	0
Degenerative disease	90	98.9	1.1
Metastases	90	97.8	2.2
Osteoporosis	89	94.4	5.6
Ankylosing spondylitis	89	93.3	6.7
Acute disc prolapse	81	25.9	74.1
Sciatica	85	3.5	96.5

Respondents' assessments of the significance of typical phrases used in radiology reports are given in Figure 2. It may be seen that all respondents regarded 'metastatic deposits' as indicative of 'severe disease' while 98% considered 'no abnormality shown' as representing normality.

Exposure to formal radiology teaching was recorded by 65 respondents as undergraduates, 14 as postgraduates and by nine under section 63 (some had had more than one form of training). A total of 20 respondents indicated no training at all (Table 2). Table 2 also shows the general practitioners' scores for knowledge of the diagnostic capabilities of lumbar radiographs. Previous training in radiology did not seem to influence knowledge. The four general practitioners who had only had section 63 training scored the lowest.

Influence of radiology results on patient management

The management options which general practitioners chose in response to the list of key phrases in radiology reports are summarized in Table 3. For phrases such as 'no abnormality seen' and 'minor degenerative change' almost all the general practitioners would treat with reassurance only, bed rest, analgesics or anti-inflammatory drugs. For 'scoliosis in under 18 year old' most general practitioners would refer to an orthopaedic surgeon whereas for 'spinal stenosis' most would choose a neurosurgeon. Not surprisingly the commonest referral option for 'ankylosing spondylitis' was a rheumatologist. For 'metastatic deposits' the majority chose general physicians. For a number of other conditions there was no consensus view, with some general practitioners preferring therapy and some preferring referral.

Loss of the open access radiology service would affect referral for hospital consultant opinion 'greatly' for 44%, 'slightly' for 55% and 'not at all' for 1% of respondents.

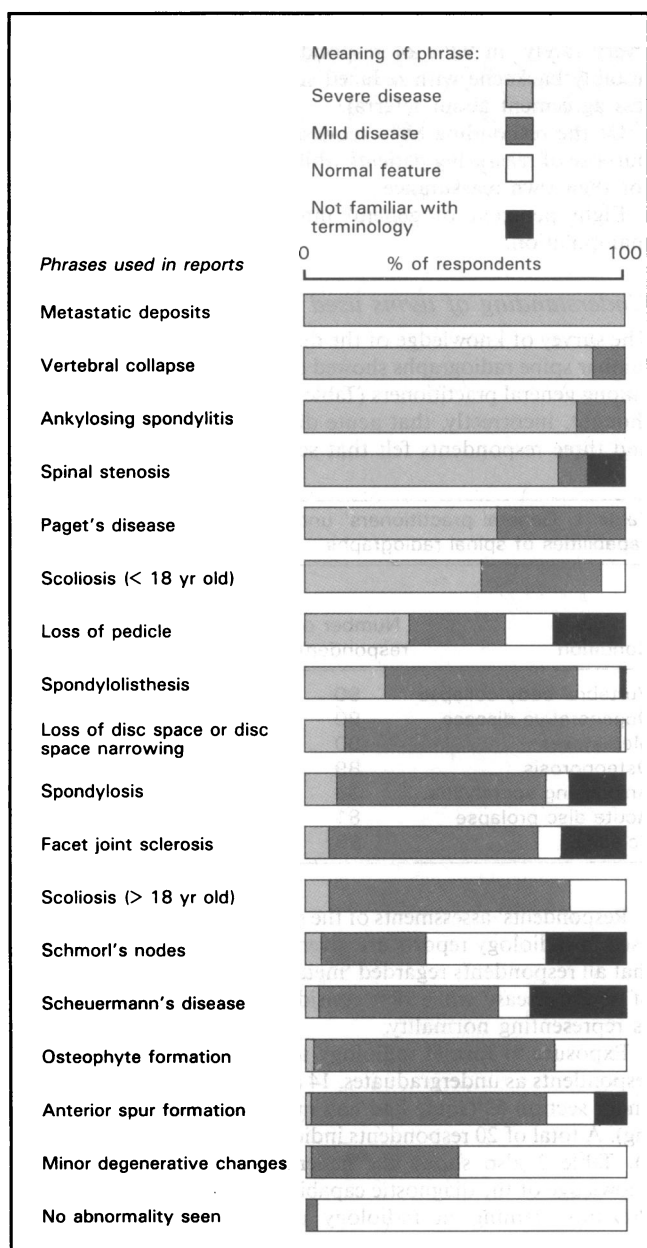


Figure 2. General practitioners' assessments of phrases used in radiology reports.

Table 2. Training in radiology and its effects on general practitioners' knowledge of diagnostic capabilities of radiological reports.

Training	Number of respondents	Mean knowledge score ^a
None	20	6.45
Undergraduate only	49	6.39
Section 63 only	4	5.50
Postgraduate and section 63	1	7.00
Undergraduate and section 63	3	6.33
Undergraduate and postgraduate	12	6.58
Undergraduate, postgraduate and section 63	1	7.00

^a Maximum score 7.

Table 3. Management options which the sample of general practitioners would choose in response to the list of phrases from radiological reports.

- Symptomatic treatment preferred by majority of GPs*
- No abnormality seen
- Osteophyte formation
- Minor degenerative changes
- Facet joint sclerosis
- Anterior spur formation
- Disc space narrowing
- Schmorl's nodes
- Secondary referral preferred by majority of GPs*
- Scoliosis in under 18 year old
- Spinal stenosis
- Metastatic deposits
- Ankylosing spondylitis
- No consensus by GPs for symptomatic treatment or secondary referral*
- Paget's disease
- Vertebral collapse
- Scoliosis in over 18 year old
- Spondylolisthesis
- Loss of pedicle
- Scheuermann's disease
- Spondylosis

The majority of respondents (81%) either failed to offer suggestions about the radiology services available to them or indicated satisfaction. Eleven per cent were critical of levels of access or speed of service and 8% wanted greater communication between radiology departments and themselves by way of seminars, or more explicit reports.

Discussion

The results showed that the most consistent policies on referral for lumbo-sacral spine radiography were adopted for backache with significant weight loss (almost always referred) and non-recurrent backache for less than one month (very rarely referred). It is interesting to note that backache with reduced straight leg raising, so frequently regarded as an important clinical finding, produced such an inconsistent response.

Radiologists have long suspected that there may be non-clinical reasons for lumbar spine radiography. Faced with a vociferous, complaining patient a general practitioner may adopt a pragmatic approach. Eighty per cent of respondents requested radiographs for patient reassurance and a further 78% for their own personal reassurance. This may imply that general practitioners' threshold for requesting radiology is fairly low and may not include a proper consideration of the radiation dose involved. On the basis of the genetically significant dose involved in these investigations and data from the International Commission on Radiological Protection¹⁵ it has been estimated that about five malignancies per million persons exposed may be induced by lumbar spine radiology. It is against this background that careful consideration of the need for radiology of the lumbar spine should be made.

In general, the general practitioners showed a good level of understanding of the diagnostic capabilities of plain lumbar spine radiographs, although over a quarter thought acute disc prolapse could be shown. Sadly, it would seem that previous educational efforts did not result in better knowledge as tested in this questionnaire. We were heartened, however, that general practitioners mostly understood the importance of phrases used by radiologists. The results helped to identify those phrases less-well understood, such as 'loss of pedicle', 'Scheuermann's disease'

and 'Schmorl's nodes', all of which needed to be checked by over 20% of the general practitioners who responded.

General practitioners' choices of therapeutic and secondary referral options revealed a number of interesting trends. When general practitioners understood the terminology and had a clear opinion of which options to choose the responses tended to be clustered into problems which they would treat symptomatically and not refer for a specialist opinion and those for which general practitioners had a clear preference for specialist opinions. The radiological terms that produced a wide spread of management options across both treatment and secondary referral fell into two categories: poorly understood terms such as 'loss of pedicle', 'Scheuermann's disease' and 'spondylosis', or terms such as 'Paget's disease', 'vertebral collapse', and 'scoliosis in over 18 year old', with which general practitioners seem familiar, although uncertain about the implications for patient management. This finding is a salutary reminder that radiologists should be more explicit when reporting radiographs and should also avoid using specialist jargon unless qualifying its significance.

It was interesting to discover that nearly half the respondents felt that loss of open-access for lumbar spine radiology would greatly affect their secondary referrals for specialist opinions. At present they can use radiology as a screening procedure to decide whether to refer on. Loss of such a service could place intolerable burdens on hospital consultants if the threshold for referrals to them is the same as that for radiology. If, however, general practitioners become more confident in their clinical diagnoses of low back pain then the long term effects might not be so dramatic. The questions that remain are whether plain lumbar spine radiology enhances the choice of symptomatic relief or specialist referral or influences referral to the most appropriate specialist. This study shows that radiological reports may greatly affect general practitioners' decision making. In a further study currently in progress we will attempt to discover whether these views are borne out in practice.

References

- Department of Health and Social Security. *Working group on back pain*. London: HMSO, 1979.
- Benn RT, Wood PHN. Pain in the back: an attempt to estimate the size of the problem. *Rheumatology and Rehabilitation* 1975; 14: 121-128.
- Biering-Sorensen F. A prospective study of low back pain in a general population. (I) Occurrence, recurrence and aetiology. *Scand J Rehabil Med* 1983; 15: 71-79.
- Biering-Sorensen F. A prospective study of low back pain in a general population. (II) Location, character, aggravating and relieving factors. *Scand J Rehabil Med* 1983; 15: 81-88.
- Biering-Sorensen F. A prospective study of low back pain in a general population. (III) Medical service — work consequence. *Scand J Rehabil Med* 1983; 15: 89-96.
- Nagi SZ, Riley LE, Newby LG. A social epidemiology of back pain in a general population. *J Chronic Dis* 1973; 26: 769-779.
- Wall BF, Darby SC, Kendall GM. A re-appraisal of the genetic consequences of diagnostic radiology in Great Britain. *Br J Radiol* 1981; 54: 719-730.
- Rockey PH, Tompkins RK, Wood RW, Wolcott BW. The usefulness of x-ray examinations in the evaluation of patients with back pain. *J Fam Pract* 1978; 7: 455-465.
- Fullenlove TM, Williams AJ. Comparative roentgen findings in symptomatic and asymptomatic backs. *Radiology* 1957; 68: 572-574.
- Torgerson WR, Dotter WE. Comparative roentgenographic study of the asymptomatic and symptomatic lumbar spine. *J Bone Joint Surg [Br]* 1976; 58A: 850-853.
- Frymoyer JW, Newberg A, Pope MH, *et al.* Spine radiographs in patients with low-back pain. *J Bone Joint Surg [Br]* 1984; 66A: 1048-1055.
- Witt I, Vestergaard A, Rosenklint A. A comparative analysis of x-ray findings of the lumbar spine in patients with and without lumbar pain. *Spine* 1984; 9: 298-300.
- Wolcott B, Tabatabai C. X-ray utilization as a result of a patient care evaluation study. *QRB* 1980; 6: 3-8.
- Scavone JG, Latshaw RF, Rohrer GV. Use of lumbar-spine films. *JAMA* 1981; 246: 1105-1108.
- International Commission on Radiological Protection. *Protection of the patient in x-ray diagnosis*. Publication no. 16. Oxford: Pergamon Press, 1970.

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Address for correspondence

Dr J P Owen, Imaging Laboratory, Royal Victoria Infirmary, Newcastle upon Tyne NE1 4LP.

CHANGE OF ADDRESS

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Applications are now being received for grants for research in or relating to general medical practice, for consideration at the May 1990 meeting of the Scientific Foundation Board. In addition to its general fund the Board also administers specific funds including the Windebank Fund for specific research into diabetes.

The Scientific Foundation Board's definition of research is catholic and includes educational research, observational as well as experimental studies, and accepts the methodologies of social science as valid. It is not in a position to fund educational activities.

If the study involves any intervention or raises issues of confidentiality it is wise to obtain advance approval from an appropriate research ethics committee otherwise a decision to award a grant may be conditional upon such approval.

Studies which do not, in the opinion of the Board, offer a reasonable chance of answering the question posed will be rejected. It may sometimes be useful to seek expert advice on protocol design before submitting an application.

Care should be taken to ensure that costs are accurately forecast and that matters such as inflation and salary increases are included.

The annual sum of money available is not large by absolute standards and grant applications for sums in excess of £15 000 for any one year are unlikely to be considered.

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