ORIGINAL ARTICLE

The lumbosacral radiographs in the initial screening of low back pain – Is one view enough?

OM Atalabi, SO Ogunlade[2], AM Agunloye[1]

Departments of Radiology and [1]Surgery, [2]College of Medicine, University College Hospital, Ibadan, Nigeria

Abstract

Background: Radiological imaging is mandatory, when investigating patients with low back pain (LBP). A minimum of three plain radiographic views of lumbosacral spine are routinely requested for by the attending clinicians.
Objective: This study is therefore carried out to determine if only one view will be sufficient in the initial screening of patients with low back pain.
Materials and Methods: The antero-posterior (AP) and lateral plain radiographs of patients referred to the radiology department on account of low back pains in an eighteen month period (June 2007 to November 2008) were reported by two certified radiologists. The findings were subjected to statistical analysis. The Kappa agreement for the two independent reports was between 0.602 and 0.908.
Results: The radiographs for 638 patients were reviewed. 365 (57.2%) were females and 273 (42.8%) were males. The age ranged from 20 years to 85 years with a mean of 56.4 years. Within the age group of 20-69 years, females were found to significantly present earlier than men with LBP (P< 0.041). The AP view had a significantly higher rate of reported normal findings that the lateral view (P<0.000). Osteophytic outgrowth was the commonest finding in both views although the rate of detection was higher on the lateral view, as with the other abnormal findings.
Conclusion: This study shows that the lateral radiographs show significantly more findings than AP on plain radiographs. It is therefore recommended that lateral radiograph is adequate in the initial screening of patients with low back pain.

Key words: Antero-posterior radiograph, lateral plain radiograph, low back pain

Date of Acceptance: 15-Mar-2011

Introduction

Low back pain (LBP) is a major cause of disability and its management is accompanied by high social cost including direct cost of medical care and the indirect cost of loss of time at work, reduction in productivity and disability payments.[1,2] In the United States, LBP is estimated to account for one-third of workers' compensation cost; costing the nation estimated $38-$50 billion annually.[3,4] In a resource poor economy like ours, where most patients have no health insurance and are solely responsible for the cost of their health care, the clinician is saddled with the responsibility of achieving the best health care management at a minimum cost especially in chronic ailments like LBP. In our hospital, the plain radiographic screening protocol for all patients presenting with low back pain is to do the Antero-posterior (AP) and lateral radiographs of the lumbo-sacral (L/S) spine and sometimes, if the patient could afford it, a coned view of the L/S junction is added. The views attract separate charges which the patient has to pay for in addition to increased radiation exposure.

The objective of this study is to determine if a single view of the L/S spine will be adequate for the initial screening of patients with low back pain, and assess which of the views gives more radiological information that will have

Address for correspondence:
Dr. Omolola Atalabi,
Department of Radiology College of Medicine, University College Hospital, Ibadan, Nigeria.
E-mail: omatalabi@comui.edu.ng

Access this article online

Quick Response Code:

Website: www.njcponline.com

DOI: 10.4103/1119-3077.86768

PMID: 22037069

an impact on the management of patients with LBP.

Materials and Methods

The plain radiographs of the L/S spine comprising AP and lateral views of patients referred to the Radiology department in the course of investigating their symptoms of low back pain between June 2007 and November 2008 were prospectively reviewed. The radiographs were obtained, using GE MS-185 machine. The AP films were taken using kilovoltage peak (KVP) of between 72 and 80 and milliamperes mAS of between 25 and 40. The lateral radiographs were done with a KVP of 80-90 and mAS of between 50 and 60. Both views were reviewed by two Consultant Radiologists independently. The coned views of L/S junction were excluded from the review because it was not routinely done. The data collected was analyzed using Statistical Package for the Social Sciences (SPSS) version 15.

Results

There were 638 patients, 365 (57.2%) were females and 273 (42.8%) were males. The age range was 20 to 85 years with a mean of 54.9 years for females and 58.4 years for males .The overall mean age of patients was 56.4 years [Table 1]. Within the age group of 20-69 years, females presented earlier than men with a *P* value of 0.041. Of the 638 radiograph pairs of AP and lateral views, 101 (15.8%) AP radiographs were found to be normal while 64 (10%) of the lateral radiographs were found to be normal. Vertebral osteophytes were the commonest abnormality on both views; accounting for 436 (68.3%) on the lateral view and 364 (57.1%) on the AP view. Loss of disc height was seen in 149 (23.4%) and 77 (12.1%) of the lateral and AP views respectively with a *P* value of 0.000. Straightening of lumbosacral spine was reported in 306 (48%) of the lateral films. Other findings like end plate sclerosis, vacuum phenomenon, spondylolisthesis, Schmorl nodes and wedge collapse were all more significantly reported in the lateral view than the AP view [Table 2]. The Kappa agreement for the independent reports of the consultants ranged between 0.602 and 0.908.

Table 1: Age and sex distribution of the patients with low back pain in the study

Age group (years)	Male	Female	Total	χ^2 value	*P* value
20-29	12 (4.4)	17 (4.7)	29 (4.5)		
30-39	21 (7.7)	41 (11.2)	62 (9.7)		
40-49	44 (16.1)	61 (16.7)	105 (16.5)		
50-59	50 (18.3)	95 (26.0)	145 (22.7)	11.600	0.041
60-69	83 (30.4)	92 (25.2)	175 (27.4)		
70+	63 (23.1)	59 (16.2)	122 (19.1)		
Total	273 (42.8)	365 (57.2)	638 (100.0)		
Mean±SD	58.36±15.06	54.91±14.46	56.38±14.81		

Discussion

Low back pain is one of the commonest clinical indications for requesting a plain L/S radiograph and accounts for 30-35% of all the radiographs done, second only to Chest radiographs. As much as radiographs can provide valuable information, they are also prone to abuse by physicians. In developing countries, it is important to reduce the cost of investigation, as there is no viable health insurance system. The role of plain radiographs in the assessment of low back pain has been the subject of many debates over the years[5] however, its usefulness cannot be disputed. Hence, guidelines have been developed by regulatory bodies in some countries to curb abuses and also reduce radiation dose to the patient.[6] However, in centres' where these guidelines exist, it has been found that clinicians especially general practitioners do not strictly comply with them.[7] There have also been arguments for and against a reduction in the number of radiographs taken in the routine lumbar spine series.[6,8-10] In a study done by Khoo *et al*,[9] evaluating the diagnostic contribution of AP radiograph in the screening

Table 2: Findings on antero-posterior and lateral radiographs in the study

Findings	Lateral view	AP view	*P* value
Normal	64 (10.0)	101 (15.8)	0.000
Vertebral body osteophytes	436 (68.3)	364 (57.1)	0.000
Loss of disc height	149 (23.4)	77 (12.1)	0.000
Facet joint degeneration	6 (0.9)	0 (0.0)	-
Schmorl's node	13 (2.0)	2 (0.3)	0.838
Wedging or collapse	24 (3.8)	17 (2.7)	0.000
Spondylosis	4 (0.6)	7 (1.1)	0.000
Scoliosis	0 (0.0)	43 (6.7)	0.000
Spondylolisthesis	58 (9.1)	6 (0.9)	0.000
Osteoporosis	57 (8.9)	50 (7.8)	0.000
Malignancy	11 (1.7)	12 (1.9)	0.000
Benign tumor	1 (0.2)	1 (0.2)	0.002
Inflammatory discitis	1 (0.2)	1 (0.2)	-
Sacroiliitis	0 (0.0)	2 (0.3)	-
Gibbus	3 (0.5)	0 (0.0)	-
Paravertebral shadow	1 (0.2)	1 (0.2)	-
Spina bifida occulta	2 (0.3)	3 (0.5)	0.000
Transitional vertebra	6 (0.9)	7 (1.1)	0.002
Vacuum phenomenon	66 (10.3)	43 (6.7)	0.000
End plate sclerosis	120 (18.8)	64 (10.0)	0.000
Straightening	306 (48.0)	0 (0.0)	0.000
Lumbarization	11 (1.7)	1 (0.2)	0.983
Calcification in a vessel	17 (2.7)	2 (0.3)	0.947
Others	9 (1.4)	8 (1.3)	0.000

P<0.05 is statistically significant, AP: Antero-posterior

of patients with LBP, they concluded that a single lateral view is adequate provided that sacroiliac joint (SIJ) disease is not assessed on this view.

In our study, conditions like *sacroiliitis* and scoliosis were justifiably better appreciated on AP radiographs, while all other conditions were statistically better appreciated on the lateral radiograph. These included spondylolisthesis, malignancies, vascular calcification, loss of disc height and end plate sclerosis. This study also shows that females statistically presented with LBP earlier than males, especially in the 30-60 year age bracket with a *P* value = 0.041 [Table 1]. Snider *et al*,[11] in their study did not find any significant difference between age groups and sexes. Further studies need to be carried out to specifically find out why women present earlier than men with LBP in our environment. However, a reason that may be adduced is the culture of carrying multiple pregnancies and strapping of babies on the back by women in our environment. Based on our findings, we recommend that in a resource poor environment where the patient is responsible for the full cost of health services, and the physician has to weigh the cost of investigation and treatment against the backdrop of losing patients to quacks; a single lateral L/S spine radiograph can be used in the initial screening of patients presenting with LBP. If abnormal findings are seen on the lateral view, the patient can be recalled for additional views like AP, coned views of L/S junction and sacroiliac joints for further evaluation. No other views would be required in most cases if the findings on the lateral view are normal. This will significantly reduce the cost and radiation dose in these patients.

References

1. Atlas SJ, Deyo RA. Evaluating and managing acute low back pain in a primary care setting. J Gen Intern Med 2001;16:120-31.
2. Frank A. Low back pain. BMJ 1993;306:901-9.
3. Frymoyer JW, Dyrette CL. The Ergonomics of spinal disorder. Philadelphia: Lippincott. Raven; 1997.
4. Lebouef-Yde C, Lauristen JM. The prevalence of lowback pain in literature. A structured review of 26 Nordic studies from 1954 to 1993. Spine (Phila Pa 1976) 1995;20:2112-8.
5. Hall FM. Back pain and the radiologist. Radiology 1980;137:861-3.
6. Davies AM, Fowler J, Tyrrell PN, Millar JS, Leahy JF, Patel K, *et al*. Detection of significant abnormalities on lumbar spine radiographs. Br J Radiol 1993;66:37-43.
7. Espeland A, Baerheim A. Factors affecting general practitioners' decisions about plain radiography for back pain: Implications for classification of guideline barriers – a qualitative study. BMC Health Serv Res 2003;3:8.
8. Davies AM. The diagnostic contribution of the frontal lumbar spine radiograph in community referred low back pain--a prospective study of 1030 patients. Clin Radiol 2003;58:604-5.
9. Khoo LA, Heron C, Patel U, Given-Wilson R, Grundy U, Khaw KT, *et al*. The diagnostic contribution of the frontal lumbar spine radiograph in community referred low back pain--a prospective study of 1030 patients. Clin Radiol 2003;58:606-9.
10. Tyrrell PN, Cassar-Pullicino VN, McCall IW. Short communication: A lateral will do? Br J Radiol 1995;68:667-9.
11. Snider KT, Jhonson JC, Snider EJ, Dengenhardt BF. Increased Incidence and severity of somatiac dysfunction in subjects with chronic low back pain. J Am Osteopath Assoc 2008;108:372-8.

How to cite this article: Atalabi OM, Ogunlade SO, Agunloye AM. The lumbosacral radiographs in the initial screening of low back pain - Is one view enough?. Niger J Clin Pract 2011;14:284-6.

Source of Support: Nil, **Conflict of Interest:** None declared.