Original article

Radiographic findings in non specific low back pain

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Abstract

Introduction: About 40% of people have low back pain (LBP) at some point in their lives. Non specific LBP where precise pathoanatomical diagnosis cannot be given comprises almost 85% of patients with isolated low back pain. Lumbosacral radiograph is preferred by most of the physicians for the initial assessment of the LBP. It is therefore crucial to evaluate patients with LBP and assess for possible relationship between low back pain and patient characteristics.

Methods: In the study, lumbosacral radiographs of 200 patients with nonspecific LBP coming to Radiology department of T.U. Teaching Hospital were reviewed between July to September 2014. The findings were classified under various categories, tabulated in the Proforma and data were analyzed using SPSS software system.

Results: Among total of 200 patients, 45% (90) were male and 55% (110) were female. The study included patients of different age ranging from 13 to 92 years with highest number in 30-39 and 40-49 age groups accounting for each 23% of total population. Lumbar spondylosis, normal radiographs and loss of lumbar lordosis were the most common three findings comprising 105 (52.5%), 55 (27.2%) and 24 (12%) of radiographs respectively. Lumber spondylosis was the most common finding after the age of 30 years with highest in the age group of 60-69 years comprising 93.8 % (15) of radiographs in that age group. Most of the radiographs of younger patients below 30 years of age were normal.

Conclusion: The study demonstrated that the occurrence of lumber spondylosis was the highest among the radiographs of patients with low back pain. The loss of lordosis and disk degeneration was also significant factors associated with low back pain.

Key words: Low back pain, lumbo-sacral spine, radiograph

Introduction

Low back pain (lumbago) is a common musculoskeletal disorder that can originate from many spinal structures including ligaments, facet joints, vertebral periosteum, paravertebral musculature, blood vessels, annulus fibrosus and spinal nerve root[1]. Low back pain (LBP) that lasts at least one day and limits activity is a common complaint[2].Globally, about 40% of people have LBP at some point in their lives, with estimates as high as 80% of people in the developed world[2]. Approximately 9 to 12% of people (632 million) have LBP at any given point in time, and nearly one quarter (23.2%) report having it at some point over any one-month period[2,3]. LBP most often begins between 20 and 40 years of age[4]. Low back pain is more common among people aged

40–80 years, with the overall number of individuals affected expected to increase as the population ages[2].

The low back is also called the lumbo-sacral area of the back.[5] The pain in this area is generally referred as low back pain. Nonspecific low back pain however means that the pain is not due to any specific or underlying disease that can be found. It is thought that in some cases the cause may be a sprain (an over-stretch) of a ligament or muscle. In other cases the cause may be a minor problem with a disc between two vertebrae, a small facet joint between two vertebrae, or in the structures and tissues of the lower back that result in pain[5]. Perhaps 85 percent of patients with isolated low back pain cannot be given a precise pathoanatomical diagnosis. The association between symptoms and imaging results is weak. Thus, nonspecific terms, such as strain, sprain, or degenerative processes, are commonly used[1].

Plain radiographs of the lumbar spine are routinely ordered in patients with acute mechanical and neurogenic pain of the lower back. X-ray is easily available and is also relatively cheap. Modern neuroimaging techniques such as CT, MRI, myelography, radionuclide imaging have improved the diagnosis and detection of the cause of LBP. These however are expensive imaging modalities that are not easily available in several communities. Thus physician tend to use radiography, at least in the initial assessment of LBP.

A minority of cases of back pain result from physical causes. Trauma to the back caused by a motor vehicle crash or a fall among young people and lesser traumas, osteoporosis with fractures, or prolonged corticosteroid use among older people are antecedents to back pain of known origin in most instances. Relatively less common vertebral infections and tumors or their metastases account for most of the remainder. Specific causes account for less than 20% of cases of back pain: the probability that a particular case of back pain has a specific cause is only 0.2%. Non-specific back pain is thus a major problem for diagnosis and treatment and is the most common cause of disability in young adults[6]. It is therefore crucial to evaluate patients with LBP and assess for possible relationship between the findings and patient characteristics.

It is not clear whether men or women have higher rates of low back pain. A 2012 review reported a rate of 9.6% among males and 8.7% among females[2, 3]. Another 2012 review found a higher rate in females than males, which the reviewers felt was possibly due to greater rates of pains due to osteoporosis, menstruation, and pregnancy among women, or possibly because women were more willing to report pain than men[2]. The purpose of our study was to explore different findings in the radiograph of patients with nonspecific low back pain and specify rate of low back pain in gender and age wise distribution.

Methodology

The study was a Cross-sectional descriptive study involving 200 radiographs performed in the radiology department of Tribhuvan University Teaching Hospital between 1st July to 30th September 2014. The radiographs of 200 patients referred to the department of radiology complaining of low back pain were reported by the radiologists. Radiographs of emergency patients and portable radiographs were not included in the study. Similarly radiographs of patients with history of trauma, specific clinical diagnosis, post operative patients and those with unknown history were also excluded. Standard antero-posterior and lateral radiographic projections were obtained. Antero-posterior radiographs were taken in the supine position with centering at the L3 level, at the level of the lower costal margin.

These radiographs were reviewed and filled in proforma made with all the major findings, using observational method. The findings were then categorized and analyzed using SPSS version 20.

Results

In this study, a total of 200 X-ray reports were reviewed from the department of radiology in TUTH from 1st July to 30th September 2014. Among a total of 200 patients, 45% (90) patients were male and the rest 55 % (110) were female. The study included patients of different age ranging from 13 years old to 92 years old. For the convenience of the study the age of the patients were grouped in interval of 10 years as nclusive grouping.

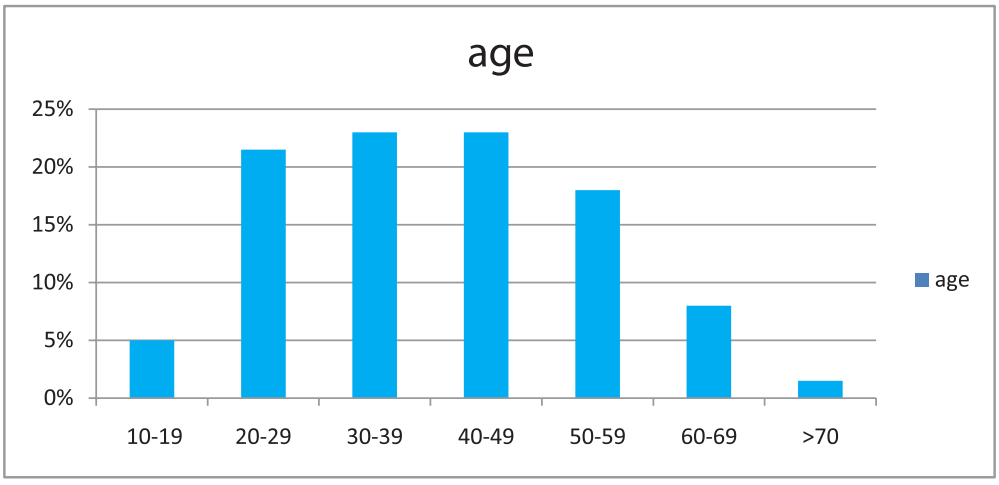

Figure 1. Age wise distribution of patients according to percentage coverage

The highest number of population was in the age group 30-39 and 40-49 i.e. 46 patients in each group which comprises 23% of the total population each. The lowest population was in >70 age group, 3 i.e. 1.5% of total population.

Diverse groups of findings were found in the studied radiographs [Table 1]. Some radiographs demonstrated more than one finding. Among the total population maximum i.e. 105 (52.5%) patients with nonspecific lower back pain had lumbar spondylosis, as the finding in their radiograph. 55 (27.2%) patients had normal finding which was the second most common finding in LS ragdiograph. Twenty four (12%) patients had loss of lordosis as the finding, which was the third most common finding. The least common finding in patients with lower back pain was spondylitis found only in 2 (1%) patients.

Table 1. Summary of different findings in all the radiographs

Findings	Number	Percentage (%)
Spina bifida	7	3.5
Spondylitis	2	1
Lumbarization	3	1.5
Sacralization	4	2
Scoliosis	4	2
Loss of lordosis	24	12
Disk degeneration	14	7
Spondylosis	105	52.5
Spondylolysis	9	4.5
Spondylolisthesis	7	3.5
Exaggerated Lordosis	5	2.5
Normal finding	55	27.5

Different findings were studied according to sex [Fig: 2]. Most of the findings were similar in both groups except spondylitis which was found only in female. Spondylosis was the most common finding in both genders.

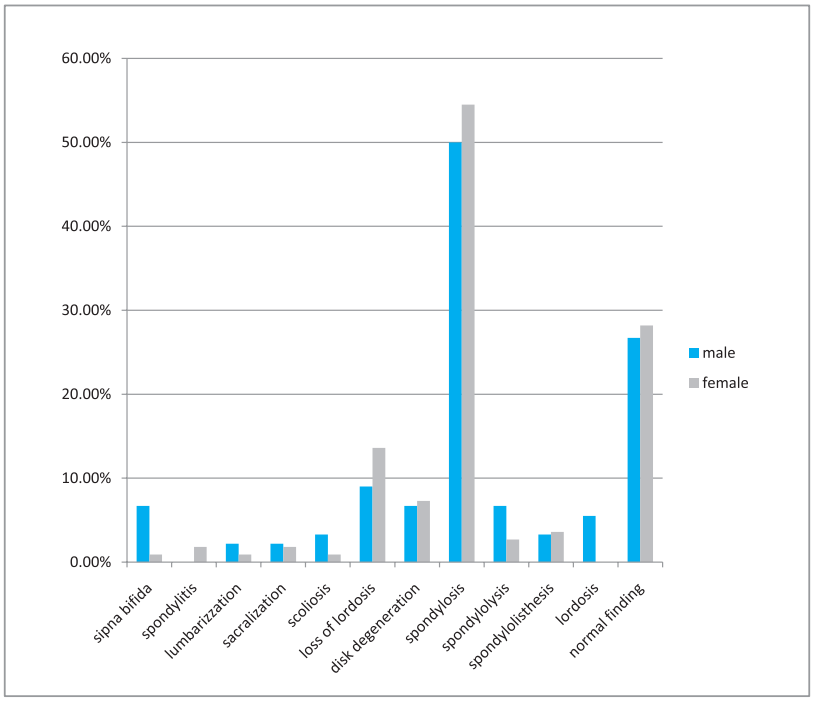

Figure 2. Distribution of findings according to sex

Distribution of different findings in various age groups were evaluated [Table 2]. The most common finding in the age group of 10-20 and 20-29 years was normal radiograph comprising 80 % and 53.5 % of the total population in the respective group. The prevalence of spondylosis was highest in the age group 50-59 years comprising 77.8% of the radiographs in this age group.

Table 2. Distribution of findings according to age group

Age group Findings	10-19		20-29		30-39		40-49		50-59		60-69		>70	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Spina bifida	1	10	1	2.3	1	2.2	2	4.3	2	5.6	-	-	-	-
Spondylitis	-	-	2	4.7	-	-	-	-	-	-	-	-	-	-
Lumbarization	-	-	1	2.3	-	-	1	2.2	1	2.8	-	-	-	-
Sacralization	-	-	2	4.7	1	2.2	1	2.2	-	-	-	-	-	-
Scoliosis	-	-	1	2.3	-	-	1	2.2	1	2.8	-	-	1	33.3
Loss of lordosis	1	10	6	14	5	10.9	8	17.4	4	11.1	-	-	-	-
Disk degeneration	-	-	-	-	3	6.5	4	8.7	4	11.1	2	12.5	1	33.3
Spondylosis	-	-	4	9.3	20	43.5	35	76.1	28	77.8	15	93.8	-	-
Spondylolysis	-	-	-	-	-	-	5	10.9	3	8.3	1	6.3	-	-
Spondylolisthesis	-	-	-	-	2	4.3	2	4.3	1	2.8	1	6.3	1	33.3
Exaggerated Lordosis	-	-	5	11.6	-	-	-	-	-	-	-	-	-	-
Normal finding	8	80	23	53.5	18	39.1	2	4.3	3	8.3	1	6.3	-	-
Total	10	100	43	104.7	46	108.7	46	132.6	36	130.6	16	125.2	3	99.9

Discussion

Radiographic evaluation of LBP plays an important role in the management of patients suffering from nonspecific lower back pain. Lumbosacral radiography is preferred by most of the physicians for the initial assessment of LBP and is one of the most frequently performed procedures in the medical imaging department.

The present study reviewed the reported radiographs of 200 patients referred to radiology department for lumbosacral radiograph, 90 (45%) were male and 110 (55%) were females giving M:F ratio of 1:1.1. Lumbar spondylosis, a degenerative process characterized by osteophyte formation was the most common finding accounting for about 52.5% (105) of the total population. This was almost similar for both male and female patients, i.e. 50% (45) of male and 54.5 % (60) of female had spondylosis as their finding. Several authors have documented the association between spondylosis (osteophytosis) and LBP [7,8]. In a study by Igbinedion BO and Akhigbe B in 337 radiographs, osteophytosis was the most common finding demonstrated in 73.6% of the patients presenting with LBP[7]. De Schepper EI et al also demonstrated osteophytosis as the most common finding in LBP followed by disc space reduction.[8]

Of the total population, 55 (27.5%) patients had normal finding which the second most common finding in the study was. Normal finding when correlated with age group, 10-19 and 20-29 age groups had highest percentage of normal finding accounting for 80% and 53.5% respectively which suggested that radiographic evaluation in smaller age group with LBP is quite insignificant. Postural theory for LBP as published by M.Y. Mafuyai et al [9] may explain the LBP in these young patients with normal radiographs. Postural theory is based on an increased weight called virtual weight that results from posture change in lumbar spine resulting into LBP.

In the present study reduction of lumbar lordosis was the third most frequently occurring finding accounting for 12% of the total population. This was non specific finding and could be positional or due to muscle spasm related to pain.

Intervertebral disc degeneration is the age related phenomenon occurring with increasing frequency with advancing age. This study showed a strong relation between advancing age and disk degeneration. The percentage of population with the finding was increasing with increasing age group, with highest percentage 33.3% in >70 age group. The study demonstrated that disk degeneration was marginally higher in female accounting for 7.3% in comparison to 6.67% in male. The association of disk degeneration with LBP was discussed by de Schepper EI et al concluding that disc space narrowing was more frequent in women than in men and increased in frequency with age[8]. Disc degeneration was the second common cause of LBP in their study.

Present study demonstrated some degree of association between spondylolisthesis and spondylolysis, spina bifida, transitional vertebrae and LBP. However, the study by van Tulder et al reported that spondylolysis and spondylolisthesis, spina bifida, transitional vertebrae diseases did not appear to be associated with lower back pain[10].

Exaggerated lumbar lordosis, spina bifida and spondylitis were less common causes of LBP in the present study. In a study done by Frymoyer JW et al increased lumbar lordosis had a significant association with decreased disc-space height and wedging deformity of the disc between the fourth and fifth lumbar vertebrae which were associated with severe LBP.[11]

Small sample size is the main limitation of our study for the very common problem in the population. Few specific causes of LBP like infective spondylitis which presents with other associated clinical findings were also reported in this study.

Conclusion

The study demonstrated that the occurrence of spondylosis was highest among the radiographs of patients with lower back pain especially in older age group. Radiographs in younger age groups with non specific low back pain usually do not demonstrate significant finding, however they are useful to exclude other important causes.

Conflict of interests: None Declared

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