ORIGINAL RESEARCH PAPER

Orthopaedics

PREVALANCE OF RADIOLOGICAL INVESTIGATION IN LOW BACK PAIN – AN OBSERVATIONAL STUDY

KEY WORDS: Low Back Pain, X-ray imaging, ACP guidelines

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ABSTRACT

Introduction: Lumbar spine pathology is major healthcare burden encountered in district and urban hospitals. Diagnostic imaging in these patients is not always indicated. Imaging is considered in those patients who show little or no improvement in their LBP after approximately six weeks of medical management with or without physical therapy, the current study was undertaken to assess the appropriateness of LBP imaging in primary care following the ACP guidelines. **Method:** The inclusion criteria for the study were adult patients with persistent low back pain with or without radiculopathy post six weeks of medical management affecting their activity of daily living. And the exclusion criteria were spinal trauma , neurological impairment, bladder and bowel involvement, spinal malformations, history of malignancy presenting at the time of index visit. **Result:** The study included total 115 patients. Out of 115 patients 87 [70%] patients showed abnormal finding on the radiographs. The most common abnormal finding was disco vertebral degeneration such as spondylosis (osteophyte formation) in 49.6%. **Conclusion:** Routine x-ray imaging in low back pain patients is not always warranted. Moreover routine radiological imaging methods are not associated with meaningful clinical outcomes for the patients. Unnecessary imaging can lead to harmful radiation exposure of the patients and can further lead to additional medical expenditure and needless surgical intervention. Diagnostic radiological imaging should be used judicially.

INTRODUCTION:

Lumbar spine pathology is major healthcare burden encountered in district and urban hospitals [1]. Acute lumbar spine pain is up to six weeks whereas subacute pathology lasts up to twelve weeks. Chronic pathology lasts more the twelve to fourteen weeks[1]Majority of productive and active phase of a person suffering from these ailments receives treatment frequently and bear expenses and job layoff [2]. Andersson [3] in his studies described various incidence in person suffering from acute or chronic pathology. Current study was undertaken according to radiological investigations of American physicians.

METHODOLOGY:

The present study was undertaken at Smt Shardaben Municipal General Hospital, Ahmedabad affiliated to NHL Municipal Medical College. The patients coming to the outpatient department with LBP were invited to take part in the observational study. The inclusion criteria for the study were adult patients with continuous symptoms with/without radiculopathy post six weeks of medical management affecting their activity of daily living. And the exclusion criteria were spinal trauma, neurological impairment, bladder and bowel involvement, spinal malformations, history of malignancy presenting at the time of index visit. The subjects who met the inclusion criteria were selected and were informed and written informed consent was taken . The study included 115 patient in which 51 were males and 64 females. The duration of the study was one year. During the follow-up after six weeks of medical treatment, patients with no improvement of symptoms or worsening of symptoms underwent radiological imaging. MRI was also prescribed to those who did not have any positive findings in X Ray imaging and still presented with the symptoms.

RESULTS:

The data was collected and assessed using SPSS version 16 software. The study included total 115 patients who underwent x-ray imaging for low back pain. Patients characteristics are shown in Table 1. The patients were predominately female (55.6%). The maximum frequency of the patients who visited were between 46-55 years of age.

Out of 115 patients 87 [70%] patients showed abnormal finding on the radiographs. Lumbosacral x-ray findings are shown in Table 2. The most common abnormal finding was disco-vertebral degeneration such as spondylosis (osteophyte formation) in 49.6% followed by loss of lumbar lordosis in 15.6% and narrowing of intervertebral foraminal space in 13%. 11.3% patients had scoliosis whereas 9.6% patients who underwent the radiological studies presented with spondylolisthesis grade one. Also there were 3.5% of patients who presented with sacroiliac joint disease. Only 11 patients needed MRI investigation in the study. Only 4.3% patients had to undergo surgical intervention whereas rest other patients were treated with analgesics with or without physiotherapy.

TABLE 1: Patients Characteristics

AGE	FREQUENCY	PERCENT
18-25	13	11.3
26-35	25	21.7
36-45	21	18.3
46-55	28	24.3
56-64	17	14.8
65 and above	11	9.6
Total	115	100

Table 2: Lumbo-Sacral X-ray Results

Abnormal X Ray Findings	Frequency	Percentage
Disco vertebral degeneration	57	49.6
Loss of lumbar lordosis	18	15.6
Narrowing of Intervertebral space	15	13.0
Scoliosis	13	11.3
spondylolisthesis	11	9.6
Sacroiliac Joint disease	4	3.5

DISCUSSION:

Papageorgiou et al. [4] in his study found that half of the

population would have suffer from lower spinal pathology in their lifespan. Frequent hospital and healthcare appointments are experience not only by adult male but also includes adult working female. [5-6] . in the advent of medical science and technology pristine radiological investigation like CT and MRI merits high sensitivity and specificity. Now a days plain X-ray imaging are advocated by some studies less frequent due to their less sensitivity. Advanced imaging modalities are not only proven satisfactory in gross pathology but also useful in patients with least symptoms [7]. In modern era extreme utilization of advanced investigations for the diagnosis of these pathology bear burden on not only healthcare system but also increased spinal surgical interventions [8]. The utilization of these latest investigations and its protocol have been addressed by many researchers, scientists and physicians. Due to inappropriate overuse of advanced imaging without need, some radiological guidelines had to be formed. Therefore radiological guideline for lumbar spinal pathology was formed by American College of Physicians [9]. Delay of the imaging up to 6 weeks of symptom onset except for the red flag symptoms is recommended. Therefore early radiological investigation is not encouraged in acute phase of the symptoms unless presence of neurological involvement[1]. Major proportion of acute symptoms get relieved within four weeks and returns to their previous/pre injury functional outcomes [10] Radiological investigation doesn't ameliorate the low back pain. Low back pain can also occur due to traumatic spinal fracture or spinal inflammations, but these conditions doesn't warrants immediate medical attention. A study stated no additional benefit of latest radiological investigation over routine X-ray. So there is general consensus to understand and emphasise on clinical examination rather than mere technology [11]. Recently increased awareness and availability of online literature, patients prefer modern investigation without advise by experts. Now a day Patients have predetermined and known scientific notion and tendency to investigate thoroughly prior to consultation with the experts[12].

Almost all the patients above 60 years of age have degenerative disc changes. Powell et al [13] study found that 30% of the patients have disc degeneration less than 30 years of age, therefore disc degeneration is poorly associated with low back pain. Physiological and known structural abnormalities are usually found in active adult population and needs clinical neurological examinations. There are many radiological hazards in doing frequent and unwarranted radiological investigation [14]. When the patient is subjected frequent radiological investigations, it affects its psychological health.[12]. Surgical intervention is strongly affiliated with unnecessary radiology [14]. Webster et al stated work related lumbar symptoms in population who undergone advanced investigation more incidence of operational intervention. Jarvik et al [15] in his study clearly described routine X-ray investigations are far safe and precise in decision making of lumbar ailments and MRI warrants only in selected cases with neurological involvement.

Chou et al meta-analysis study elaborated similar results in management of this pathology following first visit radiology and symptomatic treatment [16]. In developing country like India over investigation not only create financial burden to health care facilities but also wastes time. So in the outset if conventional treatment is unresponsive and repeated clinical and neurological examinations require percutaneous treatment justify radiological investigation. Differentiating the type character and origin of the pain of the patient during the clinical examination help to reach different lumbar pathology. This can only be achieved by taking thorough history. Thorough history also helps to rule out traumatic, infective, inflammatory, visceral and malignant aetiology. Dermatomal and motor clinical examination along with deep and superficial reflexes should be assessed at each outpatient visit. This will rule out nerve root pathology as well as discogenic pain.

Patient education is also equally important for identifying mechanical and postural low back pain. Occupation of young and middle aged population carry a huge risk of developing this scenario of low back pain. Work from home during covid-19 pandemic and sedentary life style as well as non-ergonomical work space environment also plays major role in developing LBP. Most of these complaints can be addressed by patients life style and postural modification without need of early imaging.

Acute low back pain requires proper pain alleviation, adequate back braces and avoidance of mechanical strain . Neuromodulation electrotherapy and lumbar traction in physiotherapy under strict observation of sports medicine experts can eliminate need of advanced radiological imaging and surgical intervention in majority of the cases.

Small sample size was one of the limitations of the study due to heavy workload of the municipal corporation hospital. Being an academic teaching institution, more emphasis was given on clinical and neurological examination of patient at every visit, also thorough history taking and clinical examination led to least radiological investigation of the patients. Patients adherence to the medical advice by treating orthopaedic physician in acute care setting with close follow up can mitigate radiological exposure and expenses to patient and health care system.

CONCLUSION:

Routine X-ray imaging in low back pain patients is not always warranted. Moreover routine radiological imaging methods are not associated with meaningful clinical outcomes for the patients. Unnecessary imaging can lead to harmful radiation exposure of the patients and can further lead to additional medical expenditure and needless surgical intervention. Diagnostic radiological imaging should be used judicially. There should be reservation of CT and MRI for progressing neurological symptoms or neurological deficit where surgical intervention is mandatory.

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