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Evaluation of questionnaire in assessment of low back pain and disability and find correlation between disability score, clinical features and imaging findings

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Abstract
Introduction: To evaluate the utility of a questionnaire in assessment of low back pain and disability and the correlation between disability score, clinical features and imaging findings in patients with low back pain.
Methodology: Here, we included 25 consecutive patients with duration of low back pain for 1 month who were not responding to conservative OPD treatment, and also had no reason to suspect any underlying organic disease. Each patient was analyzed on the basis of history and physical examination and a base line X-ray was taken.
Results: Here, mean age of patients is 39.8 years with female predominance. According to Q-score there are 13 out of 25 patients are of modrate category, 11 in severe cateogory and rest in extreme category. We further divide these patients into 2 types i.e concavity right side and concavity left side. There are 5 patient of former category and 1 of later.
Conclusion: A back-pain questionnaire should be designed and framed according to the life style of the patient i.e. if the patient cannot read or understand the questionnaire than it should be framed in the local language and should be read by investigator. Clinical examination is also an important tool for assessment of patients especially to support and exclude destructive and compressive lesions and also neurological diseases.

Keywords: Backpain, Clinical, Radiological

Introduction
Low back pain has been a major public health burden for many years, generating substantial work disability and healthcare costs. Among adults in the general population ,70 to 85% are believed to experience at least one episode of low back pain at some time during their life [1] while approximately 14% experience serious low back pain [i.e. pain persists for more than 2 weeks [2] and nearly 8% reporting at least one episode of severe acute low back pain [3]. In India, occurrence of low back pain is also alarming. Nearly 60% of the people in India have significant low back pain at some time or other in their lives (Suryapani, 1996) [4]. The higher incidence of low back pain in urban population is because of overall poor physical activity with excessive episodic strains [5].
A widely accepted definition of low back pain is pain, stiffness or muscle tension in the lower back, below the costal margin and above the inferior gluteal folds with or without leg pain. [Koes *et al.* 2006] [6]. A simple and practical classification which has gained international acceptance, is to divide low back pain into 3 categories, the so called "diagnostic triage'' [Waddell 1987] [7].
1. Low back pain with specific spinal pathology.
2. Nerve root pain/ radicular pain.
3. Non-specific low back pain.

Category 1 includes patients with possible specific spinal pathology eg. tumour, infection, inflammatory disorder, fracture, cauda equina syndrome. Category 2 includes radiating pain related to one or several dermatomes associated with numbness and paresthesia of variable degree.

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Category 3 includes nonspecific low back pain where pain occurs primarily in the back with no signs of serious underlying pathology [such as neoplasm, infection, cauda equina syndrome, spinal stenosis or any another specific cause like vertebral compression fracture or ankylosing spondylitis.].

Beside this, psychosocial ''yellow flags'' are factors that increase the risk of developing or perpetuating chronic pain and long term disability, including work loss associated with low back pain [Kendall *et al.* 1997] [8]. Most patients with back pain usually improve within 4 weeks of conservative management [9]. In the situation where the patient is not able to carry out basic living requirements then further imaging is needed and the option of surgery in discogenic cases may be considered. Therefore in treatment planning, the decision making has to be based upon all these factors, especially the correlation between clinical findings and imaging pictures and the protocols revised accordingly. There are many patients with mild X ray changes with higher level of reported pain and others with severe X ray changes and not so severe symptoms. So a clinical study was conducted for patients with low back pain attending Ortho O.P.D at SP Medical College, Bikaner.

Material and Methods
The study was conducted in Orthopaedic department of P.B.M. Hospital attached to S.P. Medical College, Bikaner. In our study we included 25 consecutive patients with duration of low back pain for 1 month who were not responding to conservative OPD treatment, and also had no reason to suspect any underlying organic disease. Each patient was analyzed on the basis of history and physical examination and a base line X-ray was taken. Patients with any organic musculoskeletal disorder, neurological disorder and any manifest spinal deformity are excluded. All adult patients of either sex with non specific low back pain of one month duration are included in this study.

Result

Table 1: Demogrphic Data

Mean Age		39.8years
Gender (M/F)		12/13
Religion (Hindu/ Muslim)		16/9
Occupation	LABOURER	7
	House wife	9
	Non-working	2
	Sedentary worker	3
	Farmer	4

In our study mean age of patients is 39.8 years. We had seen female dominance in our study. Labourer, house wife and farmer constitutes major population of our study.

Table 2: Clinical findings

| Q- score	Non-mild	0
	Modrate	13
	Severe	11
	Extreme	1
Lumber curvature	Scoliosis(A/P)	19/6
	Lordosis (Normal/Reduced)	11/14
Spinal tenderness	0	7
	1	11
	2	7
Rom	Flexion (0/1/2)	(5/6/14)
	Extension (0/1/2)	(20/36/44)
	Bending rom (0/1/2)	(28/52/20)

According to Q-score there are 13 out of 25 patients are of modrate category, 11 in severe cateogory and rest in extreme category. Lumber curvature is divided into 2 category i.e scoliosis and lordosis. In 6 patient scoliosis is present and 14 patients are of lordosis. Spinal tenderness is divided in 3 grades. There are 7 patients of zero grade, 11 of grade 1 and 7 of grade 2. ROM is divided in 3 category those are flexion, extension and bending ROM. These are again categorise in 3 grades which is listed in table 2.

Table 3: Scoliosis

| Scoliosis	No. of patients	%
Absent	19	76
Present	6	24
a. Concavity right side	5	24%
b. Concavity left side	1	4%
Total	25	100%

As described in table 1, scoliosis is present in 6 patients. We further divide these patients into 2 types i.e concavity right side and concavity left side. There are 5 patient of former category and 1 of later. This is shown in table 3.

In graph 1, we shown lordosis result. In this 11 out of 25 patients are normal, 14 patients show reduced lordosis and no patients shows exaggerated lordosis.
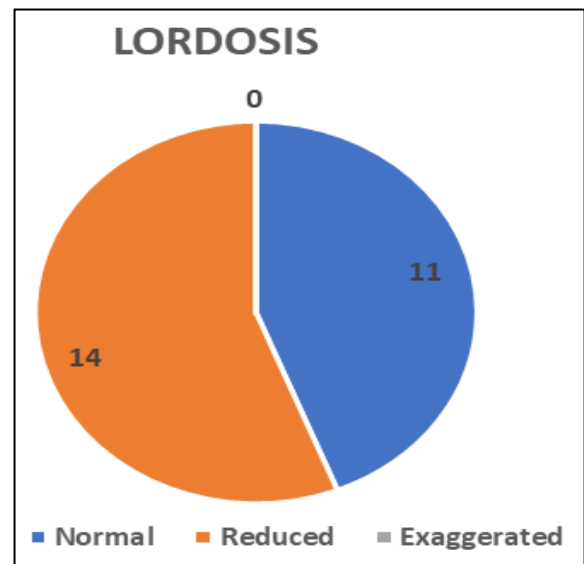
Graph 1: lordosis

In graph 2, there are 7 patients each of osteophytes and disc space narrowing in 31-40 age category. We found that there are no patients found in 11-20 years age group and in 61-70 years age group there are less patients compare to middle-aged patients.
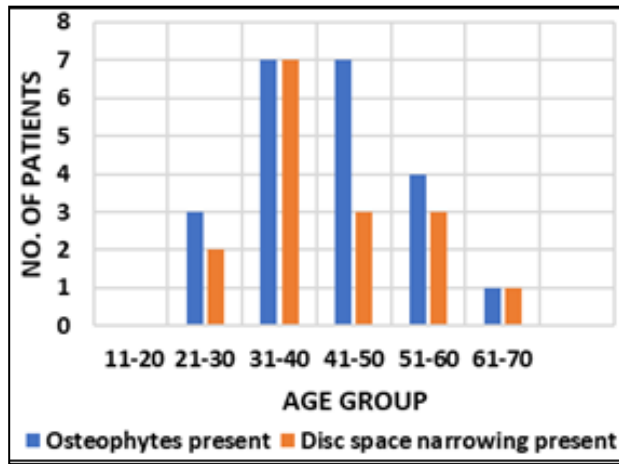
Graph 2: Osteophytes and disc space narrowing in relation with age

Table 4: x-ray findings

Osteophytes	Disc space narrowing		Total
	Present	Absent	
Present	15	7	22
Absent	1	2	3
TOTAL	16	9	25

In table 4, 15 patients are founded on X-ray of disc space narrowing with osteophytes while 2 patients had neither osteophyte formation and disc space narrowing.

In graph 3, 48% patients had moderate to severe disc space narrowing according to Lane grade and 40% patients had moderate to severe osteophytes formation according to Lane grade.
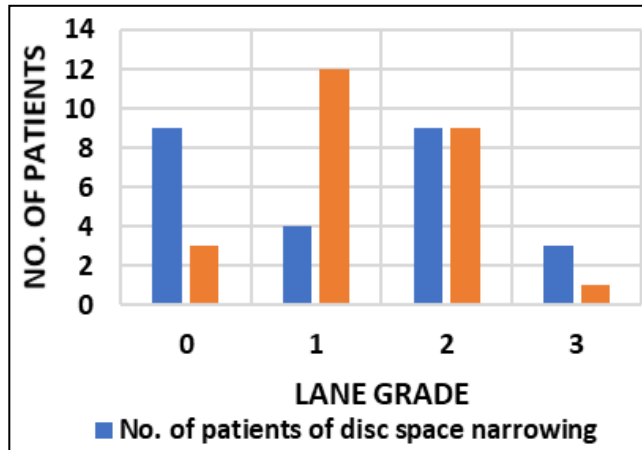
Graph 3: Disc space narrowing according to lane grade

Table 5: Disability

Grade of disc degeneration	No. of patients	%	Disability score	
			Average score	%
0	2	8	17	44.73%
1	10	40	21.8	57.36%
2	13	52	22.23	58.50%

In our study 52% patients had moderate to severe disc degeneration and average disability score among patients with Lane grade 0,1and 2 disc-degeneration was 17, 21.8 and 22.23 respectively. This data is shown in table 5.

Table 6: Q grade

Q grade	Score range	No. of patients	%	Average score	% average score
None –Mild	0-9	0	0	0	0
Mild -Moderate	10-19	13	52	16.38	43%
Moderate- severe	20-29	11	44	24.36	64%
Severe -Extreme	>30	1	4	30	78%

In table 6, Average disability score among patients with mild to moderate disability was 16.38 and among patients with moderate to severe disability and severe to extreme disability was 24.36 and 30 respectively.

Discussion
Low back pain is one of the leading causes of health problems. It is pain in the lower back area related to the lumbar spine, the discs between the vertebrae, the ligaments around the spine and discs, the spinal cord and nerves and muscles of the lower back. There are 2 common groups of low back pain – specific back pain and non-specific or mechanical low back pain [10, 14].

In our study, the average age was 39.8 years. Similar findings were seen in the study done by Jurie et al. [15] (39.2 yr), Walden et al. [16] (36.5 yr). Toshihiko Tagawachi [17] et al. conducted a similar study. Regarding sex distribution we found that there were more female (13) patients than male (12). Similar finding were seen in study done by Altinel L et al. [18] who found the affected female patients population almost double than male. In our scenario female patients are involved in more bending and squatting household activities and male patients are involved in manual labour and have similar frequency of back pain.

Regarding distribution of occupation, we found that the majority of patients were house wives (36%) followed by labourers (28%) in our study. Similar findings were seen in the study conducted by Abdul Shakoor et al. (2007) [19], Abdul Bari et al. [20], Altinel L. et al. (2008) [18], Sadigia (2008) [21] and V. Bihari et al. (2011) [22]. Cotton et al. [23] and Kar et al. [24] also reported that low back pain problems were more common in subjects who performed heavy physical work and, particularly, in those jobs that involve kneeling and squatting.

Regarding pain and disability score, we found that the average disability score was 20 and average disability index was 52.64%. In a study done by Horwath G et al. [25] the Oswestry disability index was 35.1% and radiological disc degeneration was 57.5%, Marine de Goes Salvetti et al. [26] had ODI mean disability score 33.1% and 80.7% participants revealed scores compatible with moderate to severe disability, Julie M Fritz et al. [15] (42.9%), Omidi Kashani F et al. [27] (56.7%), Dewing et al. [28] (53.6%), Carragee et al. [29] (47.2%), R K Ghatak et al. [30] (49.87%). Regarding disc degeneration, we found grade 0 – 8%, grade 1 - 40% and grade 2- 52%. Similar findings were seen in a study done by Alison H. Mc Gregor et al. [31] (grade 0-7%, grade 1 – 52% and grade 2 – 40%), Osamu Nemoto et al. [32] found (52%). Disc degeneration occurs from a variety of contributory factors. Apoptosis, collagen abnormality, aging, vascular supply anomaly, mechanical stress, inflammation, abnormal proteoglycan and possible genetic factors all of which may contribute to disc degeneration [33, 36].

We have observed that frequency of disc degeneration increased with increasing age group in this study group. Pye et al. [37] back our study with his result. Osteophytes are age-related phenomena occurring with increasing frequency with advancing age. This study shows a strong correlation between advancing age and osteophyte formation. Watanabe et al [38] documented that the size of osteophytes increases with advancing age,

thereby increasing the likelihood of exit foramina impingement by osteophytes with consequent LBP and neurological deficit. Anterior osteophytes are more common than lateral and posterior osteophytes. We observed that osteophytes were more common in housewives and labourer groups which may be attributed to the likelihood of people in this group taking up more strenuous and tasking jobs [39]. It is noteworthy that the frequency of osteophyte is remarkable from 31 years of age where most of the working population and elderly falls into. Several authors have documented the association between spondylosis (osteophytosis) and LBP [40]. O'Neill *et al.* [41] reported that osteophytosis affecting the lumbar spine are associated with LBP in men and those with more severe osteophytes were more likely to report back pain. Therefore we opined that osteophytosis share some relationship with LBP despite the contrary opinion of other authors [42].

We observed that most of the spondylolisthesis in this study occurred at the L4/L5 and L5/S1 disc spaces (the commonest sites of degenerative spondylolisthesis). Degeneration of the facets and the posterior elements are also known causes of chronic mechanical pain and sciatica. Note that anterior shift of the superior vertebra over the inferior one occurs more commonly [43]. In a population prevalence study, where the majority of persons have mild pain, radiological findings are not seen in significant people [44]. But in most of the hospital studies where reporting persons are patients and have more severe degree of pain and disability, the majorities have some abnormalities in the X ray in form of the disc space narrowing and osteophytosis at 1 or multiple levels, both of which indicate disc degeneration [45]. In our study we found a significant correlation (p value = 0.0001) that those patients who had a high grade of disc degeneration on X ray, also showed proportionate degree of pain and level of disability. During assessment of patients by a questionnaire which includes statements about difficulty in daily activities like sitting, standing, walking, squatting and bending activities as reported by the patients and clinical examination like range of motion, forward flexion and extension, SLR, spinal tenderness as measured by the investigator, we found correlation between some of the activities like forward flexion. Similar correlation was also found in other studies [46].

Conclusion

Patients problems and complaints asked in a regular history taking tend to be more descriptive than to the point. Instead the questionnaires are more specific and time saving. A back-pain questionnaire should be designed and framed according to the life style of the patient i.e. if the patient cannot read or understand the questionnaire than it should be framed in the local language and should be read by investigator. Clinical examination is also an important tool for assessment of patients especially to support and exclude destructive and compressive lesions and also neurological diseases. X rays are an essential part of the examination in case of back pain since they can be easily done anywhere, and are cost effective for screening purposes. Patients with moderate to severe disability on questionnaire also have proportionate changes in X rays. X rays help in ruling out/detecting destructive lesions. Patients having significant symptoms and definite findings but normal looking X rays, need further imaging studies in the form of MRI and CT scan.

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