ORIGINAL RESEARCH PAPER

Orthopaedics

"ASSESSMENT OF LUMBAR DEGENARATIVE CHANGES IN SYMPTOMATIC PATIENTS OF BACK PAIN (PEDICLE FACET ANGLE, FACET JOINT CHANGES) A CT BASED COMPARATIVE STUDY"

KEY WORD:

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ABSTRACT

Low back pain (LBP) is a widely prevalent problem that reportedly affects two-thirds of adults at some time in their lives. In clinical practice, many clinicians routinely request imaging to confirm their diagnosis and suggest the management.Imaging findings such as disc bulge and disc protrusion/extrusion are often interpreted as causes of back pain, triggering both medical and surgical involvements.Clinical facet joint syndrome is defined as a unilateral or bilateral back pain radiating to one or both buttocks, sides of the groin, and thighs, and stopping above the knee .The facet joints play a critical role in maintaining stability of the lumbar spine by sharing load in compression and extension, and protecting the disc from excessive shear and rotational forces. Most common spine imaging tests for assessing LBP are plain radiography, computed tomography (CT), magnetic resonance imaging (MRI), and bone scanning . Low cost and ready availability make plain radiography the most common of these . However, the poor quality of imaging studies has been cited as a potential reason that the relationship between degeneration and LBP could not be defined. In contrast to radiography, CT optimizes delineation of bony architectural details that are particularly relevant to degenerative disease . These details include end plate irregularity and sclerosis, spinal stenosis, facet joint osteoarthritis (OA), spondylolysis, and spondylolisthesis.Based upon the assessment we plan to decide whether patient will need operative management or not.

METHODS: Study includes 55 patients of age>45 years having pain >1 year not relieved by analgesics. Demografic, Clinical, Radiological data used for functional assessment of lumbar denegerative changesin symptomatic patients of back pain.

RESULTS: Distribution among age groups
27.3 % - 60-69 years
23.6% - 40-49 years
7.3% - 30-39 years
3.6% - > 80 years.The average age of the patients was 56.6 ± 12.7 years.
The difference in average age in different grades of facet OA was highly significant ($p<0.0001$) with male(34)>female(24).Mean BMI of study population 22.6 ± 1.5 Kg/m2. Excellent LBOS score of > 65 was found among 14.5% cases. Based on computed tomography facet joint
7.3% - normal
47.3 %- mild OA,
23.5 % - moderate OA
10.9% - severe OA.

CONCLUSION: CT imaging plays very crucial role in diagnosing facet joint degenerations and correlate very well with the associated clinical findings. Visual analogue scores and low back outcome score provide fair assessment of clinical symptoms and provide important clues to the clinicians to opt for radiological imaging. CT findings have paramount utility while determining the surgical or conservative management for the patients.

INTRODUCTION

Low back pain (LBP) is a widely prevalent problem that reportedly affects two-thirds of adults at some time in their lives [1]. In clinical practice, many clinicians routinely request imaging to confirm their diagnosis and suggest the management.Imaging findings such as disc bulge and disc protrusion/extrusion are often interpreted as causes of back pain, triggering both medical and surgical involvements.[2]A clinical examination and history are important to properly diagnose back pain. Red flags that indicate the possibility of cancer, infection, or trauma must be identified or ruled out. [3] Nonorganic signs or "Waddell signs" should be kept in mind to detect psychological distress.[3] The localization of back pain is an important factor and can be derived from patient inquiry and simple clinical examination. Specifically, centralized pain has high sensitivity, but a poor specificity with regard to discogenic pain in the presence of a competent annulus, whereas lateralized pain patients often present without central pain and commonly have facet joint-originated pathology.[3-5]Clinical facet joint syndrome is defined as a unilateral or bilateral back pain radiating to one or both buttocks, sides of the groin, and thighs, and stopping above the knee [6]. The facet joints play a critical role in maintaining stability of the lumbar spine by sharing load in compression and extension, and protecting the disc from excessive shear and rotational forces. Determined by their spatial orientation, facet joints also guide motion between 2 adjacent vertebrae. Their oblique orientation in the lumbar spine allows flexion, extension, and lateral bending, but only a small amount of axial rotation.It has been shown that in patients with DS, the facet joints are significantly moreSagittally oriented, thus allowing the superior vertebra to glide anteriorly. Individuals with sagittally oriented facet joints have therefore been regarded as prone for development of Degenerative spondylolisthesis (DS) [7] In primary care settings, the most common spine imaging tests for assessing LBP are plain radiography, computed tomography (CT), magnetic resonance imaging (MRI), and bone scanning . Low cost and ready availability make plain radiography the most common of these [8] .In contrast to

radiography, CT optimizes delineation of bony architectural details that are particularly relevant to degenerative disease . These details include end plate irregularity and sclerosis, spinal stenosis, facet joint osteoarthritis (OA), spondylolysis, and spondylolisthesis. Abnormalities that can be demonstrated and categorized by CT include osteophyte formation; hypertrophy of articular processes; articular cartilage thinning; vacuum phenomenon in joints and discs; synovial and subchondral cysts; and calcification of the joint capsule, vertebral end plates, and ligaments [9-11].

The aim of the present study was to evaluate the association between degenerative features of the lumbar spine evaluated on CT and LBP as assessed by low back outcome score among the patients attending orthopaedic outpatient department of this tertiary care center. Furthermore, we also plan to examine the relation between different lumbar spine degeneration features including intervertebral disc narrowing, facet joint OA, spondylolysis, spondylolisthesis, and spinal stenosis and the various other factors like age, gender, occupation and status of the physiotherapy or pharmacological treatment earlier sought by the patient .Based upon the assessment we plan to decide whether patient will need operative management or not.

AIM AND OBJECTIVES

The aim of research studying facet joint changes on CT. The research design is in line with following major objectives.

1. To assess lumbar degenerative changes in symptomatic patients of back pain (pedicle facet angle ,facet joint changes) by ct scan
2. To study the clinical characteristics of patients with low backache
3. To study the demographic data of patients presenting with low backache
4. To decide whether patient will need operative management or not.

MATERIALS AND METHOD

Study Design

This observational study was done in tertiary care hospital.

Ethics Committee Approval and Consent Procedure

The study was approved by institutional Ethics Committee for research work. Informed written consent in the vernacular language spoken and understood by the subjects , was obtained from all the study subjects enrolled in the study

Inclusion Criteria

1. Patients with chronic back pain with duration more than 1 year not relieved with analgesics.
2. Age > 45 yrs
3. Patients with chronic back pain with featuressuch as pain , numbness , loss of sensation , loss of power , increase in tone in lower limbs

Exclusion criteria:

1) Diagnosed neurological dysfunction such as-
a) STROKE leading to monoparesis /monoplegia /paraparesis /paraplegia /quadriparesis /quadriplegia
b) PERIPHERAL NEUROPATHIES
c) GUILLAIN-BARRE SYNDROME
d ATAXIA
2) Traumatic lumbar spine injury.
3) Congenital spine deformities
4) Malignancy and metastasis of spine
5) Psychological dysfunction
6) Tuberculosis of spine and other infections of spinal cord
7) Previously spine operative history

SAMPLE SIZE ESTIMATION

Sample size was calculated by using computerized software winpepi (Version 11.65 copyright J.H.Abramson Aug.23,2016) Approx. 95% CI for difference between proportions.

After adjusting for methodologic variation, the mean ± SEM point prevalence was estimated to be 11.9 ± 2.0% . So a prevalence of 14 % was used.

An error rate of 10 % was considered.
So sample size= z2x px (1-p)/e2= 1.96x1.96x14x84/(10x10)=46.

We assumed 20% insufficient data, withdrawal of consent and loss to follow up.Thus adjusted sample size=46+20 %(46)= 55 cases were included. We considered sample size of 55..

Evaluation of spinal degeneration features

For CT reading, we used transverse plan images as well as sagittal and coronal .

All spinal degeneration features were evaluated between L2 and S1 spinal levels.

Intervertebral disc narrowing

Disc narrowing was estimated on a sagittal reconstruction image using the four-grade scale by Videman et al[12]. For this study, this scale was collapsed to two grades: 1—normal, included Grades 0 and 1; and 2—affected, included Grades 2 and 3. The subject with at least one affected level was considered as having intervertebral disc narrowing.

Facet Joint Oa

Four grades (0—normal, 1—mild, 2—moderate, and 3—severe degeneration) of facet joint. This semiquantitative score accounts for such changes as joint space narrowing, osteophytes, hypertrophy of the articular process, subarticular sclerosis, subchondral cysts, and vacuum phenomenon.

Lumbar facet joints were graded on both sides at L2–L3, L3–L4, L4–L5, and L5–S1 levels. For this study, this index was dichotomized on the basis of the presence or absence of facet joint OA (Grade 2 or more) on any side at any level.

Spondylolysis and spondylolisthesis

Spondylolysis and spondylolisthesis were defined as present or absent (dichotomous indices) for each subject.

Spinal stenosis

Bone and soft-tissue windows were used. For measurements of congenital spinal stenosis, the mid sagittal diameter of the spinal canal was measured at the level of the middle of the Vertebra using a CT bone window. Acquired spinal stenosis was measured as a mid-sagittal Diameter of the spinal canal at the level of the intervertebral disc (the effective canal diameter was determined between the margin of the intervertebral disc anteriorly and the junction of bilateral ligamenta flava posteriorly) using a CT soft-tissue window.

Pain assessment

Assessed with help of visual analogue scale (1-10) where
ZERO –no pain at all
TEN -worst pain

Low Back Outcome score :

The LBOS of Greenough and Fraser [13] was used for measuring functional **outcome** in patients with **low back** pain. The LBOS **scale** ranges from 0 to 75 and the higher **score** indicates better condition. It categorizes patients into a 4-grade classification scheme: excellent ≥65; good 50–64; fair 30-49, and poor 0–29.

Item	Answers	Scores
Factors scoring 9 points		
1. Current pain (VAS)	7–10	0
	5–6	3
	3–4	6
	0–2	9
2. Employment (housewives related to previous abilities)	Unemployed	0
	Part-time	3
	Full time, lighter	6
	Full time, original	9
3. Domestic chores	None	0
	A few but not many	3
	Most, or all but more slowly	6
	Normally	9
4. Sport/active social (dancing)	None	0
	Some-much less than before	3
	Back to previous level	9
Factors scoring 6 points		
1. Resting	Resting more than half the day	0
	Little rest needed, occasionally	4
	No need to rest	6
2. Treatment or consultation	More than once per month	0
	About once per month	2
	Rarely	4
	Never	6
3. Analgesia	Several times each day	0
	Almost every day	2
	Occasionally	4
	Never	6
4. Sex life	Severely affected (impossible)	0
	Moderately affected (difficult)	2
	Mild affected	4
	Unaffected	6
Factors scoring 3 points		
Sleeping, walking, sitting, travelling, dressing	Severely affected (impossible)	0
	Moderately affected (difficult)	1
	Mild affected	2
	Unaffected	3

Statistical Analysis

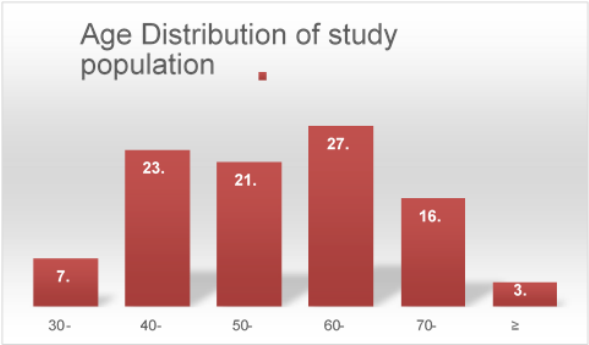
We used Student's t tests to compare continuous variables and Chi-Square tests to assess differences in proportions and to measure the linear trend as appropriate. Pearson's correlation coefficient along with two sided significance was used to assess correlations between variables. We deemed p values less than 0·05 to be significant. We used Microsoft Excel 2016 for data compilation and IBM SPSS version 20.0 for all statistical analyses.

Observations and Results

This prospective observational study was conducted at tertiary care center. Total 55 participants were enrolled in the study. The findings of the study have been tabulated as follows.

Table 1.1: Age distribution of study population

Age	No	Percentage
30-39	4	7.3
40-49	13	23.6
50-59	12	21.8
60-69	15	27.3
70-79	9	16.4
≥ 80	2	3.6



Maximum cases i.e. 27.3 % were found to be in the age group 60-69 years, followed by 23.6

% in 40-49 years group. There were only 7.3% patients in age group 30-39 years and 3.6% above 80 years.

Table 1.2 Average age comparison between groups based on Severity Grade of facet OA

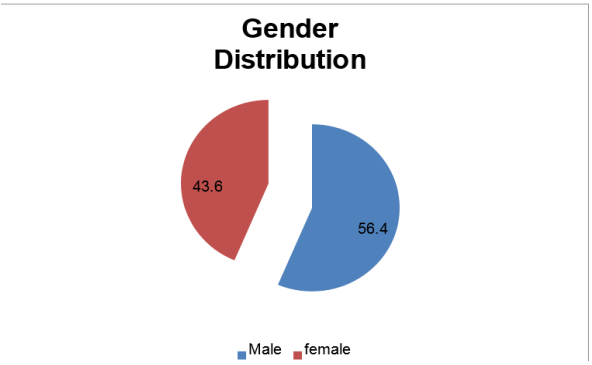
Severity Grade of facet OA	N	Mean Age	Std. Deviation	P
Normal	4	35.3	4.3	<0.0001
Mild degeneration	26	50.7	8.2	
Moderate degeneration	19	63.1	7.9	
Severe Degeneration	6	76.2	3.5	
Total	55	56.6	12.7	

The average age of the patients was 56.6 ± 12.7 years.

The average age of the patient when categorized based on Severity Grade of facet OA was found to be highest (76.2± 3.5 years) in severe degeneration group . The average Age of the patient increased with increasing Severity of facet OA. The difference in average age in different grades of facet OA was highly significant (p<0.0001)

Table 2.1 Gender distribution of study population

Gender	No	Percentage
Male	31	56.4
Female	24	43.6



There was male preponderance with 31 males and 24 females. The gender ratio of the study was (M:F=1:0.774)

Table 2.2 Gender distribution among groups based on Severity Grade of facet OA Gender. * Facet OA Grades Crosstabulation

	Facet OA Grades					
	Normal	Mild degeneration	Moderate degeneration	Severe degeneration	Total	p

Gender.	Female	Count	1a, b	17b	5a	1a	24	0.022
		%	25.0%	65.4%	26.3%	16.7%	43.6%	
	Male	Count	3a, b	9b	14a	5a	31	
		%	75.0%	34.6%	73.7%	83.3%	56.4%	
Total		Count	4	26	19	6	55	
		%	100.0%	100.0%	100.0%	100.0%	100.0%	

Each subscript letter denotes a subset of Facet OA Grades categories whose column proportions do not differ significantly from each other at the .05 level.

When the cross tabulation of gender and severity grades of facet OA was done, it was found that there were more males in severe degeneration group (83.3 % males vs 16.7 % females). There were more females in normal and mild grade than moderate and severe grades. The distribution was significantly different among various facet OA grades (p=0.02)

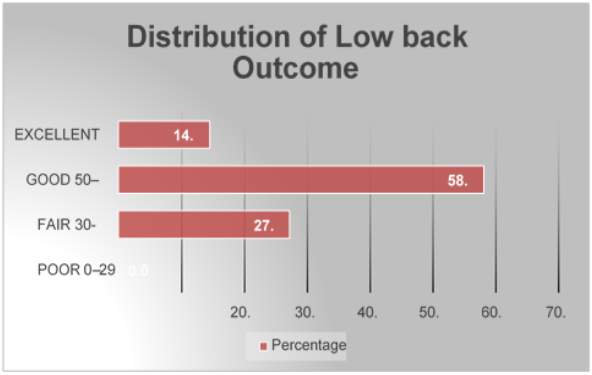
Table 3: Average BMI comparison among groups based on Severity Grade of facet OA

Severity Grade of facet OA	N	Mean BMI in Kg/m2	Std. Deviation	p
Normal	4	23.6	2.7	0.542
Mild degeneration	26	22.4	1.5	
Moderate degenaration	19	22.6	1.4	
Severe degeneration	6	22.6	1.0	
Total	55	22.6	1.5	

Mean BMI of the study population was 22.6 ± 1.5 Kg/m2. The average BMI were in normal range (18.5-25 KG/M2) across all severity grades. (p=0.542)

Table 4: Distribution of LBOS (Low back outcome score)

LBOS (Low back outcome score) 0	No	Percentage
poor 0–29	0	0.0
fair 30-49	15	27.3
good 50–64	32	58.2
excellent ≥65	8	14.5

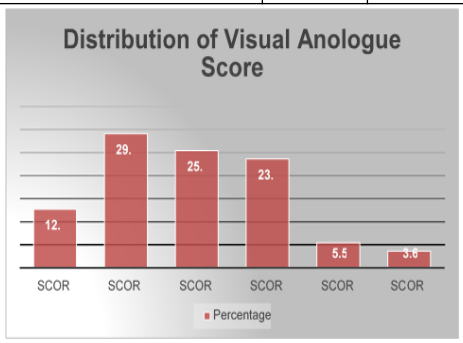


LBOS (Low back outcome score) was calculated using various assessment questions. Excellent LBOS score of > 65 was found among 14.5% cases.

LBOS categorized as good score (between 50-64) was found among 58.2% cases. Fair score was found in 27.3 % cases.

Table 5: Distribution of Current pain based on Visual analogue score (VAS)

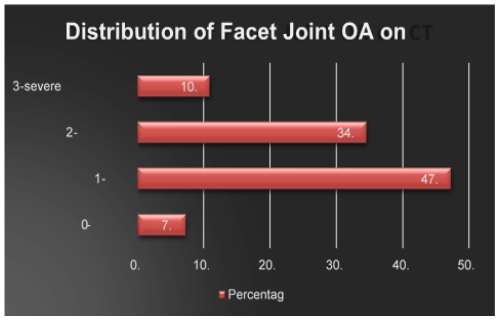
Current pain based on Visual analogue score (VAS)	No	Percentage
3	7	12.7
4	16	29.1
5	14	25.5
6	13	23.6
7	3	5.5
8	2	3.6



The pain as assessed with the help of 0-10 cm point's visual analogue score revealed that the minimum score was 3 cm and maximum score was 8cm. The average VAS score was 4.9 ± 1.25 cm.Majority of the patients had score between 4 to 6 cm. Only 5.5 % had score of 7 cm and 3.6 % had score of 8 cm. The average VAS score was 4.9 ± 1.25 cm

Table 6.1: Distribution of Facet joint OA Grades based on CT Findings

Facet joint OA Grades	No	Percentage
0-normal	4	7.3
1-mild	26	47.3
2-moderate	19	34.5
3-severe degeneration	6	10.9

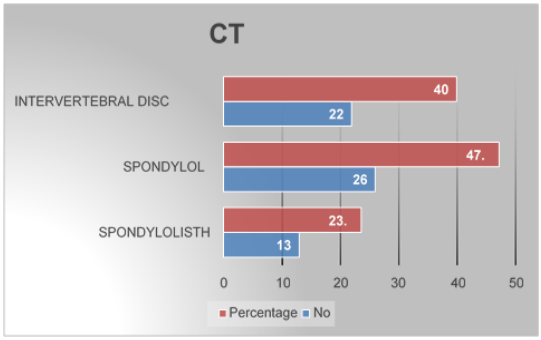


Based upon the radiological study using computed tomography, 4 cases (7.3%) were found to have normal facet joints.

47.3 % cases had mild degree of facet joint osteoarthritis. 23.5 % cases had moderate osteoarthritis and 10.9% had severe degeneration in the facet joint.

Table 6.2 Distribution of findings on CT

Findings on CT	No	Percentage
Spondylolisthesis	13	23.6
Spondylolysis	26	47.3
Intervertebral disc narrowing	22	40



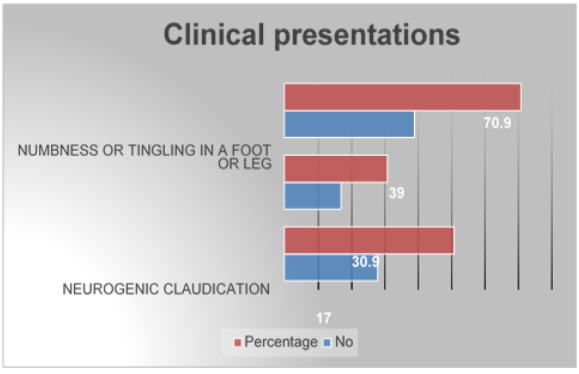
Based upon the radiological study using computed tomography the findings were analysed further.

Intervertebral disc narrowing was observed in 40% cases.

Spondylolysis i.e. crack or stress fracture in one of the vertebrae was noted in 47.3 % cases whereas spondylolisthesis i.e. the slippage of one vertebral body with respect to the adjacent vertebral body was obsereved in 23.6 % cases.

Table 7: Clinical presentations

Clinical presentations	No	Percentage
Pain or cramping in one or both legs	28	50.9
Neurogenic claudication	17	30.9
Numbness or tingling in a foot or leg	39	70.9

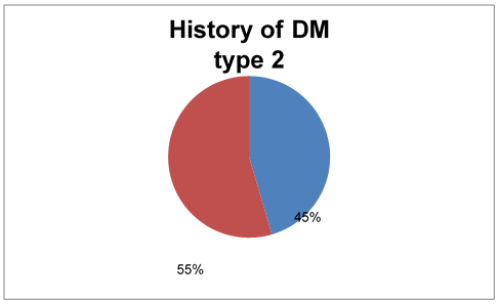


Pain or cramping in one or both legs was reported by 50.9% patients.

Numbness or tingling in a foot or leg was reported by 70.9% patients. Neurogenic claudication was reported by 30.9 % patients.

Table 8: History of DM Type 2

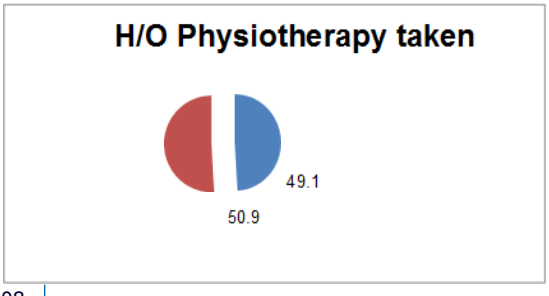
H/O DM Type 2	No	Percentage
Yes	25	45.5
No	30	54.5



45.5 % cases had history of diabetes mellitus type 2.

Table 9: History of physiotherapy taken.

H/O Physiotherapy taken	No	Percentage
Yes	27	49.1
No	28	50.9



Approximately half of the patients (49.1 %) had taken physiotherapy for their symptoms at least once in the past.

Table 10 : Correlations of VAS with Facet OA Grades Correlations of VAS with Facet OA Grades

	Facet OA Grades	
VAS	Pearson Correlation coefficient	.397**
	Sig. (2-tailed)	.003
	Sum of Squares and Cross-products	21.455
	Covariance	.397
	N	55

Visual analogue score was positively correlated to facet OA grades, (Pearson Correlation coefficient=0.397) The correlation was highly significant. (p=0.003)

Table 11 : Comparison of average VAS among groups based on Severity Grade of facet OA

Severity Grade of facet OA	N	Mean VAS	Std. Deviation	p
Normal	4	4.25	.500	.013
Mild degeneration	26	4.62	1.299	
Moderate degenaration	19	5.00	1.054	
Severe degeneration	6	6.33	1.211	
Total	55	4.91	1.266	

Visual analogue score increased significantly from normal to severe degeneration. This suggests that higher pain was reported by patients in severe degeneration.

Table 12: Correlations of Low back outcome score with Facet OA Grades

	Severity of facet OA	
Low back outcome score	Pearson CorrelationCoefficient	-0.385**
	Sig. (2-tailed)	.004
	Sum of Squares and Cross- products	-82.909
	Covariance	-1.535
	N	55

Low back outcome score was negatively correlated to facet OA degeneration grades. (Pearson Correlation coefficient= 0.385).

The correlation was highly significant (p=0.004).

Table 13: Average Low back outcome score comparison among groups with Facet OA Grades

Severity Grade of facet OA	N	Mean Low back outcome score	Std. Deviation	p
Normal	4	62.50	5.686	0.001
Mild degeneration	26	55.92	7.965	
Moderate degeneration	19	52.68	5.598	
Severe degeneration	6	44.50	6.253	
Total	55	54.04	7.937	

Average Low back outcome score went on decreasing with severity of Facet OA Grades. It shows that poor scores indicated severe disease.

Table 14: Correlations of clinical diagnosis with CT based Severity of facet OA

	Severity of facet OA	
Neurogenic claudication	Pearson Correlation	.259
	P	.057
Radiculopathy	Pearson Correlation	.217
	P	.112
Arthritic back pain	Pearson Correlation	0.560**
	P	<0.0001
Chronic pain syndrome	Pearson Correlation	.247
	P	.069

Mechanical back pain	Pearson Correlation	-.040
	P	.770

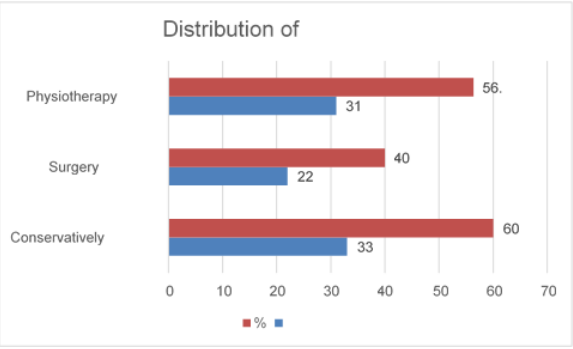
Correlations of clinical diagnosis with CT based Severity of facet OA indicated that Neurogenic claudication AND Radiculopathy were positively correlated to severity of facet OA. However the correlations were not statistically significant (p>0.05)

Arthritic back pain was strongly and significantly correlated to severity of facet OA grades (Pearson Correlation=0.560) (p <0.0001)

Mechanical back pain was negatively correlated with severity of facet OA grades.

Table 15: Distribution of management

Management	Number	%
Conservatively managed	33	60
Surgery suggested	22	40
Physiotherapy started	31	56.4



Total 60 % of the symptomatic cases were managed conservatively whereas only 40 % were recommended surgery. 56.4 % cases were started with physiotherapy.

DISCUSSION

The aim of the present study was to evaluate the association between degenerative features of the lumbar spine evaluated on CT and low back pain as assessed by low back outcome score among the patients attending orthopaedic outpatient department of the tertiary care center.

In comparison to X ray imaging , CT improves anatomic evaluation of the facet joints due to its ability to provide cross-sectional images of the opposing joint surfaces in the axial plane

Thus CT has emerged as a valuable tool in diagnosing different lumbar spine degeneration features including intervertebral disc narrowing, facet joint OA, spondylolysis, spondylolisthesis, and spinal stenosis.

Based upon the radiological study using computed tomography, 4 cases (7.3%) were found to have normal facet joints.

47.3 % cases had mild degree of facet joint osteoarthritis. 23.5 % cases had moderate osteoarthritis and 10.9% had severe degeneration in the facet joint.

In this study we found correlations between various factors like age, gender, and clinical assessment scores with the changes observed on CT.

The average age of the patients in this study was 56.6 ± 12.7 years. The youngest study participant was 30 years old whereas the eldest was 81 years old.

Maximum cases i.e. 27.3 % were found to be in the age group 60-69 years, followed by 23.6 % in 40-49 years group. There were only 7.3% patients in age group 30-39 years and 3.6% above 80 years

The average age in our study falls well within the range of these studies. Although in a small proportion, but its noteworthy that low back ache is reported in lower age also.

The average age of the patient when categorized based on Severity Grade of facet OA was found to be highest (76.2± 3.5 years) in severe degeneration group .The average Age of the patient increased with increasing Severity of facet OA.Our findings were in tandem with the study by Kalichman L and Guermazi A,[13] who reported prevalence of disc narrowing, facet joint OA, and degenerative spondylolisthesis showed a significant linear trend (p < 0.0001) of association with increasing age. In our study we noticed that there was male preponderance with 31 males and 24 females. The gender ratio of the study was (M:F=1:0.774).

When the cross tabulation of gender and severity grades of facet OA was done in this study, it was found that there were more males in severe degeneration group (83.3 % males vs 16.7 % females).

Kalichman L and Guermazi A,[13] reported significantly higher prevalence of facet joint OA was found in the obese group OR (95%CI):2.8 (1.1-7.2).

The Low-Back Outcome Score categorizes patients into a 4-grade classification scheme: excellent ≥65; good 50–64; fair 30-49, and poor 0–29 [14-15].

We observed that excellent LBOS score of > 65 was found among 14.5% cases. LBOS categorized as good score (between 50-64) was found among 58.2% cases. Fair score was found in 27.3 % cases.

We found LBOS useful and convenient for primary assessment of low back ache patients since Low back outcome score was negatively correlated to facet OA degeneration grades. (Pearson Correlation coefficient=0.385) and the correlation was highly significant (p=0.004).

The pain as assessed with the help of 0-10 point's visual analogue score revealed that the minimum score was 3 and maximum score was 8. The average VAS score was 4.9 ± 1.25 cm.

Majority of the patients had score between 4 to 6 cm. Only 5.5 % had score of 7 cm and 3.6 % had score of 8 cm. The average VAS score was 4.9 ± 1.25 cm

Visual analogue score was positively correlated to facet OA grades, (Pearson Correlation coefficient=0.397) The correlation was highly significant.(p=0.003).

Dones et al [16] also found VAS useful in assessment of chronic back pain.

Because of its ability to provide cross-sectional images and to provide a higher contrast between bony structures, CT improves anatomic evaluation of the FJs and is the preferred method for imaging FJ osteoarthritis [17].

Intervertebral disc narrowing was observed in 40% cases.

Spondylolysis i.e. crack or stress fracture in one of the vertebrae was noted in 47.3 % cases whereas spondylolisthesis i.e. the slippage of one vertebral body with respect to the adjacent vertebral body was observed in 23.6 % cases.

Correlations of clinical diagnosis with CT based Severity of facet OA indicated that Neurogenic claudication and radiculopathy were positively correlated to severity of facet OA. However the correlations were not statistically significant (p>0.05)

Arthritic back pain was strongly and significantly correlated to severity of facet OA grades (Pearson Correlation=0.560) (p <0.0001).

Total 60 % of the symptomatic cases were managed conservatively whereas only 40 % were recommended surgery. 56.4 % cases were started with physiotherapy.

SUMMARY

This prospective observational study was conducted at tertiary care center. Total 55 participants were enrolled in the study. The study is summarized as follows.

1. Maximum cases i.e. 27.3 % were found to be in the age group 60-69 years, followed by 23.6 % in 40-49 years group. There were only 7.3% patients in age group 30-39 years and 3.6% above 80 years.
2. The average age of the patients was 56.6 ± 12.7 years .The average age of the patient when categorized based on Severity Grade of facet OA was found to be highest (76.2± 3.5 years) in severe degeneration group. The average Age of the patient increased with increasing Severity of facet OA.
3. The difference in average age in different grades of facet OA was highly significant (p<0.0001)
4. There was male preponderance with 31 males and 24 females. The gender ratio of the study was (M:F=1:0.774)
5. When the cross tabulation of gender and severity grades of facet OA was done, it was found that there were more males in severe degeneration group (83.3 % males vs 16.7 % females). There were more females in normal and mild grade than moderate and severe grades. The distribution was significantly different among various facet OA grades (p=0.02)
6. Mean BMI of the study population was 22.6 ± 1.5 Kg/m2. The average BMI were in normal range (18.5-25 KG/M2) across all severity grades. (p=0.542)
7. LBOS (Low back outcome score) was calculated using various assessment questions. Excellent LBOS score of > 65 was found among 14.5% cases.
8. LBOS categorized as good score (between 50-64) was found among 58.2% cases.Fair score was found in 27.3 % cases.
9. The pain as assessed with the help of 0-10 cm point's visual analogue score revealed that the minimum score was 3 cm and maximum score was 8cm. The average VAS score was 4.9 ± 1.25 cm.
10. Majority of the patients had score between 4 to 6 cm. Only 5.5 % had score of 7 cm and 3.6 % had score of 8 cm. The average VAS score was 4.9 ± 1.25 cm
11. Based upon the radiological study using computed tomography, 4 cases (7.3%) were found to have normal facet joints. 47.3 % cases had mild degree of facet joint osteoarthritis. 23.5 % cases had moderate osteoarthritis and 10.9% had severe degeneration in the facet joint.
12. Based upon the radiological study using computed tomography the findings were analysed further. Intervertebral disc narrowing was observed in 40% cases.
13. Spondylolysis i.e. crack or stress fracture in one of the vertebrae was noted in 47.3 % cases whereas spondylolisthesis i.e. the slippage of one vertebral body with respect to the adjacent vertebral body was obsereved in 23.6 % cases.
14. Pain or cramping in one or both legs was reported by 50.9% patients.Numbness or tingling in a foot or leg was reported by 70.9% patients.Neurogenic claudication was reported by 30.9 % patients.
15. 45.5 % cases had history of diabetes mellitus type 2.
16. Approximately half of the patients (49.1 %) had taken physiotherapy for their symptoms at least once in the past.
17. Visual analogue score was positively correlated to facet OA grades, (Pearson Correlation coefficient=0.397) The correlation was highly significant. (p=0.003)
18. Low back outcome score was negatively correlated to facet OA degeneration grades. (Pearson Correlation coefficient=0.385).The correlation was highly significant (p=0.004).
19. Average Low back outcome score went on decreasing with severity of Facet OA Grades. It shows that poor scores indicated severe disease.
20. Correlations of clinical diagnosis with CT based Severity of facet OA indicated that Neurogenic claudication AND Radiculopathy were positively correlated to severity of facet OA. However the correlations were not statistically significant (p>0.05)
21. Arthritic back pain was strongly and significantly correlated to severity of facet OA grades (Pearson Correlation=0.560) (p <0.0001)Mechanical back pain was negatively correlated with severity of facet OA grades.
22. Total 60 % of the symptomatic cases were managed conservatively whereas only 40 % were recommended surgery. 56.4 % cases were started with physiotherapy.

CONCLUSION

Because chronic low back pain of facet joint pain origin represents a major health care problem, diagnosis and management of such a high prevalent condition as facet joint syndrome is a major socioeconomic burden.

CT imaging plays very crucial role in diagnosing facet joint degenerations and correlate very well with the associated clinical findings. Visual analogue scores and low back outcome score provide fair assessment of clinical symptoms and provide important clues to the clinicians to opt for radiological imaging.

Facet joint-related anatomical and radiologic knowledge is essential for successful facet joint syndrome management. CT findings have paramount utility while determining the surgical or conservative management for the patients. However all clinical correlations and individual patient requirements must be considering while deciding upon management type.

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