

# Evaluation of Causes of Low Back Pain in Indian Population with Special Reference to Sacroiliitis.

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## ABSTRACT

**Background:** The aim of this analysis was to study various clinical presentation, epidemiological prevalence, various diagnostic tools applied and basic management of low back pain in special reference with sacroiliitis.

**Methods:** We reviewed 360 patients with low back pain. Patients were evaluated and diagnosed by proper history, clinical, radiological and haematological examination. Conservative treatment trial was given to all. Results were evaluated by JOA score in the form of recovery rate at one month and at three month. **Results:** Mean age group affected is 40.59 years and most common cause is musculoskeletal strain. Males are more commonly affected. Among total patients of low back pain 16.38 % were suffering from sacroiliitis. On conservative treatment after 3 months, 41.67 % had GOOD recovery rate and 12.5 % had excellent recovery rate. **Conclusion:** Prevalence of low back pain is maximum in 4<sup>th</sup> decade of life. Males are affected more commonly (55 %). Most patients had sedentary life style. Onset of low back pain is mostly gradual (96.39 %) and most common cause is musculoskeletal strain (36.67 %). Sacroiliitis consisting 16.37 % of the total patients with low back pain. Among the special tests, FABER's test is most commonly positive in all patients, but STORK's test is most commonly positive in patient with sacroiliitis. After 3 months of conservative trial 41.67 % patients had GOOD recovery rate, and 12.5 % had excellent recovery rate.

**Keywords:** Low back pain, epidemiology, conservative management, recovery rate.

## INTRODUCTION

Low back pain is common health problem nowadays. About 65 to 80% of world population develop back pain at some time during their lives.<sup>[1-3]</sup> Impairment of back and spine are the chronic condition that most frequently affects daily activities. The commonest age groups affected are adults and elderly.

Stress beyond physical capacity or work in awkward position are occupational risk factors. Other risk factors are sedentary life style, obesity, osteoporosis, jerky modes of transport, scoliosis, kyphosis and psychological disorders like neurosis, hysteria, conversion reaction, depression etc.<sup>[2,3,4,5-9]</sup>

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Causes of low back pain:<sup>[4,10,11]</sup>

These are broadly divided into two-

Those from within the vertebral column and those from outside the vertebral column

- a. Those from within the vertebral column-
  - 1) Congenital- spina bifida, spondylolisthesis, hemi vertebra, split vertebra
  - 2) Mechanical and Degenerative- disc prolapse, spondylosis and spondylolisthesis, spinal canal stenosis
  - 3) Inflammatory
  - 4) Non specific
  - 5) Acute and chronic infection
  - 6) Connective tissue disorder- ankylosing spondylitis
  - 7) Metabolic bone disease- osteomalasia, osteoporotic collapse of vertebra
  - 8) Neoplasm- metastatic carcinoma, primary tumor of bone, haematological malignancy
  - 9) Traumatic
- b. Those from outside the vertebral column-
  - 1) Abdominal disorder-pancreatitis, cholecystitis, biliary colic.
  - 2) Pelvic disorder- pelvic inflammatory disease, intrapelvic tumors

- 3) Genitourinary causes- renal infection, renal or ureteric calculus.
- 4) Vascular disorder- dissecting aneurysm of aorta, thromboembolism
- 5) Musculoskeletal strain.

### Sacroiliitis:

Sacroiliitis characterised by inflammation of sacroiliac joint. It often confused for sciatica or other conditions that causes lower back pain and can be extremely painful. Common symptoms of sacroiliitis are fever, pain and stiffness. Pain usually low back pain, leg pain, hip joint or buttock pain. Pain worsen with sitting for prolong period and when rolling over bed. Stiffness felt in the hips and low back after getting out of bed in the morning or after sitting for long time.

Factors predispose to developing sacroiliitis<sup>[12-14]</sup> are any form of spondyloarthropathy and other rheumatological disease, degenerative arthritis of spine, degeneration of sacroiliac joints leading to inflammation of sacroiliac joint, trauma that affects low back. Pregnancy and child birth<sup>[15]</sup> causing widening and stretching of sacroiliac joint, infection of sacroiliac joint, osteomyelitis, urinary tract infection, endocarditis or IV drug uses/ Drug addiction .

Most of the patients of low back pain relieved from conservative treatment in the form of anti-inflammatory drugs, analgesics, physical exercises, local application of heat, lumber support, corticosteroids and rest<sup>[11,16-20]</sup>.

### Sacroiliitis grading:

Sacroiliitis can be graded on plain film as follows.

**Grade 0:** Normal

**Grade 1:** Some blurring of the joint margins-suspicious

**Grade 2:** Minimal sclerosis with some erosion

**Grade 3:** Severe erosion with widening of joint space +/- some ankylosis

**Grade 4:** Complete ankylosis

We conducted a study in our outpatient department and those admitted to our hospital to evaluate causes of low back pain with special reference to sacroiliitis. conservative treatment was given to all and results evaluated at 1 month and 3 month duration.

## MATERIALS AND METHODS

A prospective study was conducted on the patients attended OPD and those admitted in the department of orthopaedics of L. L. R. Hospital for complaint of low back pain. Our study population consisted 360 patients. Patients were followed at 1 month and at 3 month duration. Study period was about 2 years from Nov. 2009 to Aug. 2011.

All patients with low back pain were examined and cases with low back pain arising from within the

vertebral column except traumatic origin were included in the study. Cases with low back pain arising from outside the vertebral column were excluded from the study.

The locomotor system with posture and gait was examined, any deformity of spine, obvious furrow, paravertebral fullness, sinus were looked for.

SLR test, femoral stretch test, figure of 4 Gaenslen's test and pelvic compression distraction test were performed. Various movements of lumber spine were performed and recorded. Detailed neurological examination with muscle power, sensory loss and reflex changes were noted.

Special tests for diagnosis of sacroiliitis were performed are Gaenslen's test, Faber's test, Gilly's test and Stork's test.

All patients of low back pain were evaluated and diagnosed by proper history, clinical, radiological and haematological examination and conservative treatment trial was given to all results were evaluated by JOA score in the form of recovery rate at one and three months.

### The Japanese orthopaedic association's evaluation system for low back pain syndrome (JOA Score)

Subjective symptoms	Evaluation	Score
Lower back pain	None	3
	Occasional, mild	2
	Occasional, severe	1
Leg pain and/tingling	Continuos, severe	0
	None	3
	Occasional, mild	2
Gait	Occasional. severe	1
	Continuos, severe	0
	Normal	3
Able to walk further than 500 mt although it results in symptom		2
	Able to walk further than 100 mt	0
<b>Clinical signs</b>		
Straight leg raising test	Normal	2
	30-70	1
	< 30	0
Sensory disturbance	None	2
	Slight disturbance	1
	Marked disturbance	0
Motor disturbance	Normal	2
	Slight weakness (MMT 4)	1
	Marked weakness (MMT 3 to 0)	0

Restriction of ADL	Impossible	Difficult	Easy
Turn over while lying	0	1	2
Standing up	0	1	2
Washing face	0	1	2
Leaning forward	0	1	2
Sitting	0	1	2
Lifting or holding heavy object	0	1	2
Running	0	1	2
Urinary bladder function	Normal	0	
	Mild dysuria	3	
	Severe dysuria	3	

**Recovery rate:**

Excellent	>90%
Good	75-89 %
Fair	50-74 %
Poor	< 50

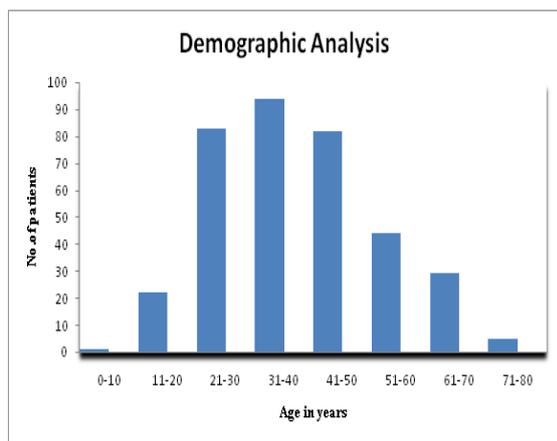
**RESULTS**

The study involved 360 cases from Nov. 2009 to Aug. 2011. Patients were followed at 1 month and at 3 months [Table 1, Figure 1].

**Table 1: Demographic analysis.**

Age group	NO. Of Patients	Percentage
0-10	01	00.2
11-20	22	06.11
21-30	83	23.06
31-40	94	26.11
41-50	82	22.78
51-60	44	12.22
61-70	29	08.06
71-80	05	01.39
<b>Total</b>	<b>360</b>	

From the above table, it was obvious that Low back pain was common in patients of age group 31-40 years.

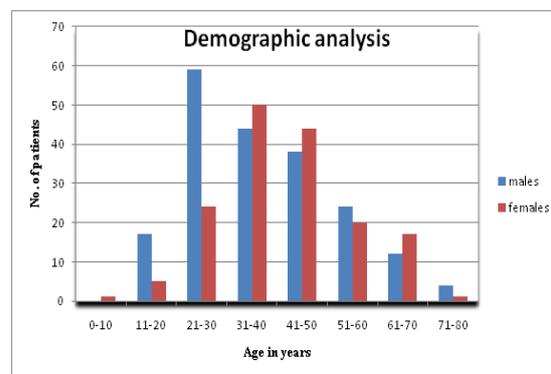


**Figure 1: Demographic Analysis (Age Distribution).**

**Table 2: Demographic analysis.**

Age Groups	No.( Male Patients)	NO.( Female Patients)
0-10	00(00.00%)	01(00.63%)
11-20	17(08.58%)	05(03.08%)
21-30	59(29.80%)	24(14.81%)
31-40	44(22.22%)	50(30.86%)
41-50	38(19.19%)	44(27.16%)
51-60	24(21.12%)	20(12.34%)
61-70	12(06.06%)	17(10.49%)
71-80	04(02.02%)	01(00.63%)
<b>Total</b>	<b>198</b>	<b>162</b>

In male patients commonly affected age group was 21-30 years and in female patients commonly affected age group was 31-40 years [Table 2, Figure 2].

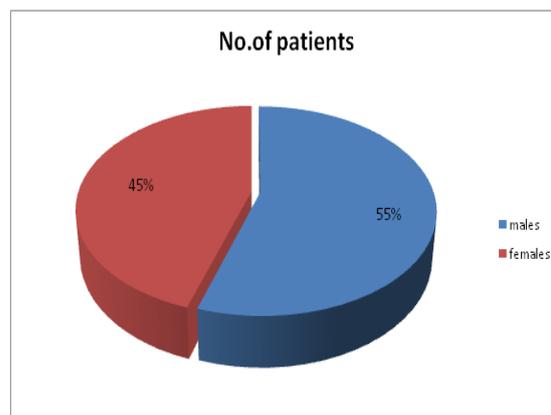


**Figure 2: Demographic Analysis (Sex Distribution).**

**Table 3: Incidence of low back pain in sexes.**

Sex	No. of patients	Percentage
M	198	55.00
F	162	45.00
<b>Total</b>	<b>360</b>	<b>100.00</b>

In our study, 198 patients were male and 162 were female. So it was obvious that low back pain is more common in males (55%) [Table 3, Figure 3].



**Figure 3: Incidence of low back pain in sexes.**

**Table 4: Occupation.**

Occupation	No. of Patients	%
SEDENTARY	188	52.22
MODERATE	157	43.61
HEAVY	15	04.17
<b>TOTAL</b>	<b>360</b>	<b>100</b>

Out of 360 patients in our study maximum number of patients, suffering from low back pain had a sedentary life style [Table 4, Figure 4].

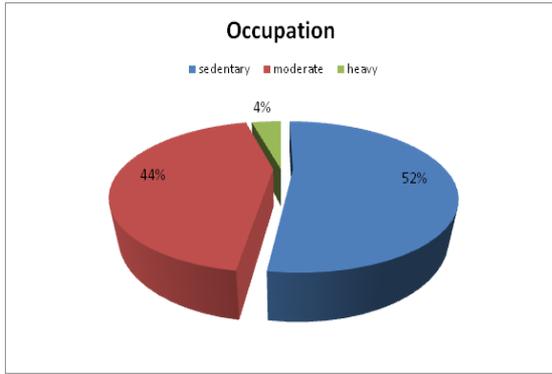


Figure 4: Occupation.

Table 5: Demographic distribution of Sacroiliitis patients.

Age Groups	No. of Patients of Sacroiliitis	%
0-10	00	00.00
11-20	05	08.47
21-30	17	28.81
31-40	21	35.59
41-50	10	16.95
51-60	05	08.47
61-70	01	01.69
71-80	00	00.00
TOTAL	59	

Patient suffering from Sacroiliitis were maximum in number in the age group of 31-40 years [Table 5, Figure 5].

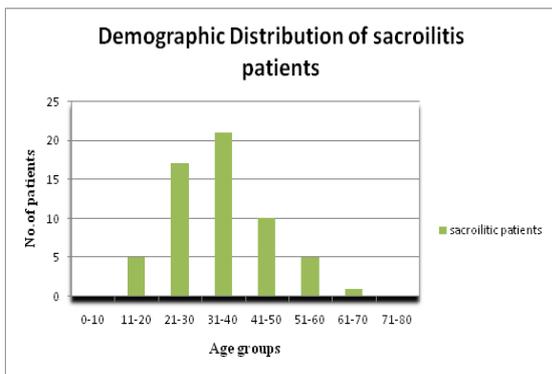


Figure 5: Demographic distribution of Sacroiliitis patients.

Table 6: Onset of low back pain.

Onset	No. of patients	%
Acute	13	3.61
Gradual	347	96.39
Total	360	100.00

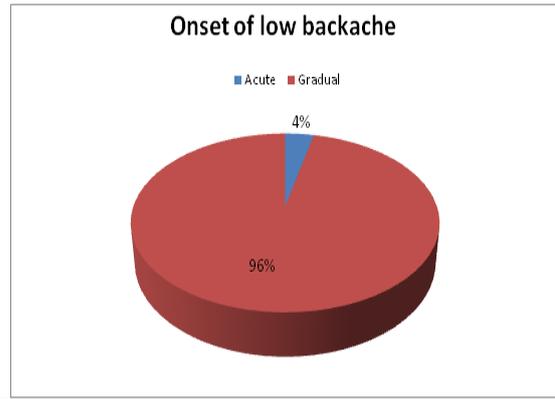


Figure 6: Onset of low backache.

Table 7: Incidence of low back pain.

Diagnosis	No. of Patients	Percentage
Fibromyalgia	01	0.28
Lumbar canal stenosis	24	6.67
Lumbar spondylitis	13	3.62
Musculoskeletal strain	132	36.67
Osteoporotic collapse	22	6.12
Pott's spine	11	3.06
Sacroiliitis	59	16.37
Prolapsed intervertebral disc	27	7.50
Spondylololsthesis	19	5.27
Idiopathic	52	14.44
<b>Total</b>	<b>360</b>	<b>100</b>

Most of the patients with low back pain had gradual onset of pain and most common cause of low back pain is musculoskeletal strain [Table 6 & 7, Figure 6 & 7].

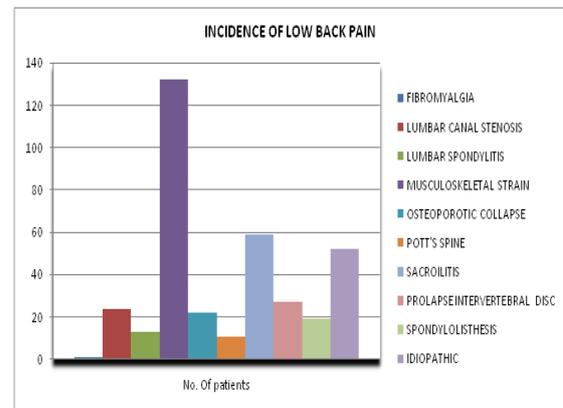
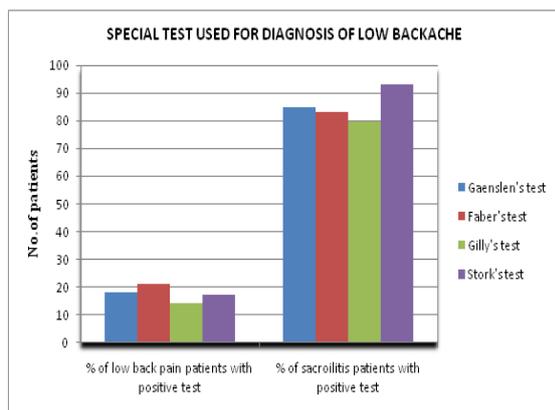


Figure 7: Incidence of low back pain.

**Table 8: Special tests used for diagnosis of low back pain.**

Tests	% Of Low Back Pain Patients With Positive Test	% Of Sacroiliitis Patients With Positive Test
Gaenslen's test	17.78	84.75
Faber's test	20.83	83.05
Gilly's test	13.89	79.66
Stork's test	16.94	93.22

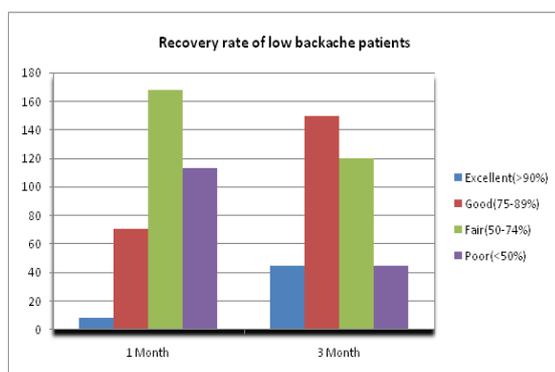


**Figure 8: Special tests used for diagnosis of low back pain.**

Among the tests used to diagnose patients of low back pain, FABER's test is commonly positive than others. But in patients with sacroiliitis, STORK's test is most commonly positive [Table 8, Figure 8].

**Table 9: Recovery rate of low back pain patients.**

Recovery Rate	1 Month	%	3 Month	%
Excellent (> 90%)	08	02.22	45	12.5
Good (75-89%)	71	19.72	150	41.67
Fair (50-74%)	168	46.67	120	33.33
Poor (<50%)	113	31.39	45	12.5
<b>Total</b>	<b>360</b>	<b>100</b>	<b>360</b>	<b>100</b>



**Figure 9: Recovery rate of low back pain patients.**

In all patients, low back pain was subjected to conservative treatment and the recovery rate was calculated at 1<sup>st</sup> and 3<sup>rd</sup> month [Table 9, Figure 9]. At one month follow up most of patients had FAIR recovery rate with only 2% had excellent recovery rate.

At three-month follow up most of patients had GOOD recovery rate with 12.5% had excellent recovery rate.

**Table 10: Summary Statistics of the Listed Variables.**

Variables	N	MEAN +/- SD
Age	360	40.59 +/- 14.06
Duration	360	11.99 +/- 23.77
VAS (Score)	360	4.26 +/- 0.95
Back pain	360	1.84 +/- 0.47
Leg pain	360	2.67 +/- 0.48
Gait	360	2.11 +/- 0.59
SLR	360	1.91 +/- 0.32
Sensory disturbance	360	1.97 +/- 0.18
Motor disturbance	360	1.98 +/- 0.16
Activities of daily life	360	9.28 +/- 1.33
JOA Score 0	360	21.77 +/- 2.21
JOA score(1 mth)	360	25.56 +/- 2.70
Recovery rate (1 mth)	360	54.79 +/- 22.74
JOA Score (3 mth)	360	26.70 +/- 2.48
Recovery rate (3 mth)	360	71.01 +/- 21.63
Uric acid	360	3.65 +/- 0.75

From our study, it is obvious that low back pain is common in mean age group 40.59 years. Average mean duration of presentation of patients of low back pain is 11.99 months with standard deviation of 23.77 and average mean of VAS score of pain is 4.26 with S.D. of 0.95 [Table 10].

## DISCUSSION

Low back pain is very common ailment and in this study, we focused on epidemiology, clinical features, various diagnostic tools applied and treatment, especially conservative management of low back pain with special emphasis given to sacroiliitis.

Our study was based on clinical history, physical examination, radiological examination and haematological examination.

Low back pain is common in the 3rd, 4th and 5th decade of life. In our study, approximate 72 % of patients fall in this age group. Mean age of study population is 40.59 years.

As far as sex distribution is concerned low back pain is more common in females<sup>[2,6,21]</sup>, but in our study it was found to be more common in males, consisting a total 55 %. The reason for this is that males are seeking more attention than females for their problems.

Study showing that sedentary life style is more common cause for high incidence of low back pain. This is probably due to poor tone of back and abdominal musculature, putting excessive strain on ligaments and joints of the back leading to early

degenerative changes.

Most of patients had gradual onset of low back pain with mean duration of 11.99 months. This supports the view that poor toning of abdominal and back muscle leads to gradual onset and prolong duration of backache.

Amongst the etiology of low back pain, musculoskeletal strain was found to be most common cause, consisting 32.67 % of total study population.

In the study of total 360 patients, we diagnosed 59 patients (16.37 %) of low back pain was sacroiliitis. Maximum incidence of sacroiliitis was found to be in 4<sup>th</sup> decade of life with male predominance.

Amongst the special tests, FABER's test was found to be most commonly positive in patients of low back pain, but in patients with sacroiliitis, is STORK's test.

On subjecting patients to conservative management and evaluating them ( by JOA Scoring system), we found out the recovery rate at 1<sup>st</sup> follow up (at 1 month) was 66.15=18.2 and at 2<sup>nd</sup> follow up (at 3 month) was 82.8=13.2 incidence.

The mechanism by which the pain syndrome of low back pain and sciatica originate is obscure. In most of cases, exact clinical diagnosis could not be made, they were classified as nonspecific. Simple radiography usually fails to ascertain any etiology.

In our study, we detected no abnormality in majority of X-rays. Although x-rays reveal some degenerative and pathological changes in some patients. Thus we agree with the fact that all patients with low back pain should not be subjected to x-rays exposure. X-rays should be prescribe to estimate its severity and need for surgery if any.<sup>[22]</sup> MRI is certainly the most important development in the diagnosing the cause of low back pain, but it is very expensive.

Coste et al (1995)<sup>[23]</sup> in their study found that 90% of patients with acute low back pain recovered within 2 weeks.

In our study, it was found that at first follow up (after 1 month) approx. 113 patients (31.39 %) were having poor result on conservative management. This is probably due to noncompliance of the patients for the treatment regime, poor general health, higher age group, pressure of work and sedentary life style, but result of conservative trial at 2<sup>nd</sup> follow up (at 3 months) were good (41.67 %).

On conservative management of low back pain for 3 month a total of 360 patients we observed that, 150 patients (41.67 %) showed good improvement and 120 patients (33.33 %) showed fair improvement and thus we concluded that all patients of low back pain without neurological deficit should be given a conservative trial. This is accordance with prospective study performed by Webers (1978)<sup>[18]</sup>, who says that a 3 month conservative trial before surgery is justified.

In our study that showed a poor recovery rate at 3 months were mostly female patients with long standing or chronic low back pain and old age patients. So we agree with poor prognostic factors elucidated by Coste et al (1995)<sup>[23]</sup> for low back pain. According to him they are, previous chronic episode of low back pain, Female sex, depression, poor bone mineral density etc.

Comes in 1961<sup>[24]</sup> and Benzon in 1986<sup>[25]</sup> concluded study on patients of low back pain along with neurological signs and concluded that recovery in neurological signs was better with epidural steroid injection as compared to conservative management and the duration of recovery is also shortened. In our study we had subjected all the patients to conservative management. We did not have any comparable group subjected to any other modalities of treatment.

According to Wittenberg (1997)<sup>[11]</sup>, injection procedures for low back pain should be reserved for patient having pain for at least 2 weeks duration and not responding to conservative management.

Our study supports the study of Balaque and borenstein (1988)<sup>[11]</sup> who showed that mechanical disorders are the cause of vast majority of low back pain and non surgical management is effective in most patients with mechanical disorders of any form.

Another supporting study is conducted by Trang H. Nguyen et al (2007)<sup>[20]</sup> on patients with occupational nonspecific low backache and he concluded that 90 % of persons are able to return to work in relatively short period of time on conservative management.

Serum Uric acid was not found to be having any significant association with low back pain in our study group. The mean value being 3.65 mg/dl.

## CONCLUSION

The study was carried out to find out the epidemiology, clinical presentation of various diagnostic tools applied and basic management of low back pain with special reference to sacroiliitis.

The findings of the study summarised are:

1. Low back pain is one of the most common complaints among the patients attending to Orthopaedics OPD.
2. The prevalence was maximum in 4<sup>th</sup> decade of life.
3. Both sexes were affected but in our study, males were affected more often.
4. Mean duration of complaints in our study was 11.99 months.
5. Occupation most commonly affected was of housewives followed by businessman and students having sedentary life style.
6. In our study, onset of low back pain was mostly gradual (96.39 %).

7. Musculoskeletal strain was most common cause among the patients of low back pain (36.67 %).
8. Among 360 patients of low back pain, sacroiliitis constituting 59 (16.37 %). Among the patients of sacroiliitis 3<sup>rd</sup>, 4<sup>th</sup> and 5<sup>th</sup> decade constituting more than 81% patients.
9. FABER's test most commonly positive in all patients of low back pain, but STOTK's test was most commonly positive in patients of sacroiliitis.
10. All patients of low back pain was given conservative trial and followed at 1 month and at 3 months, results at 3 months was more satisfactory.
11. Average mean of VAS score of low back pain patients was 4.26.
12. Average mean of Uric acid of low backache patients was 3.65 mg/dl. Shows no any significant association with low back pain.

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