

## Genesis of Low Backache in Young Adults

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### ABSTRACT

**Objective:** To establish relevance between low back pain and transitional vertebra at lumbosacral junction.

**Research Design:** was qualitative, descriptive and cross sectional.

**Setting:** The study was conducted at the Department of Diagnostic Radiology, Fatima Jinnah Medical University/Sir Ganga Ram Hospital, Lahore in collaboration with the Departments of Orthopedics, Neurology, Medicine and Neurosurgery of the same hospital who were referring patients with backache for X-Rays.

**Duration:** Study period was six months from Nov 2015 to April 2016.

**Sample Size and Selection:** First 200 patients referred to Radiology Department during the study period with the presenting complaint of low backache and advised MRI.

**Sampling Technique:** Random/ Non Probability and convenient sampling.

**Materials and Methods:** Patients referred to the Radiology Department for X Ray Lumbosacral spine and MRI. These young adults had presenting complains of with low backache referring to one of the legs, restricted body movements first with activity and later at rest, numbness and foot drop. Bony changes and normal variants such as sacralisation and changes occurring in the visualized spine secondary to this variation were first documented on digital X- Rays taken at right angles to one another mostly as frontal and lateral of the lumbosacral spine. The patients were then referred for MRI Lumbosacral Spine, which confirmed not only the bony but also associated soft tissue abnormalities as well.

**Results:** The results of our study showed that sacralisation is a very common finding and manifests in the form of early degenerative changes in the Lumbosacral spine.

**Conclusion:** Identification of a transitional vertebra is important in young adults as it is a common cause of low backache.

**Key words:** Spondylosis, sacralisation, MRI.

### INTRODUCTION

The number of cases is constantly rising of patients referred from a number of specialties' to radiology department for X Ray and MRI Lumbosacral spine with the complain of low backache. Previously this complain was more common in postmenopausal females secondary to osteoporosis or in post traumatic patients but lately age of onset and gender has tilted from late to early onset and from female population to both genders especially in the age group of 30-40 yrs. One general observation made when studying the radiographs of large number of such patients was the presence of sacralisation which was confirmed on correlative MRI.

Sacralization is a condition present since birth from partial or complete fusion of last lumbar(L5)vertebral body and the first sacral

vertebra usually at the level of transverse processes (hence known as pseudoarthrosis).<sup>1</sup> Many clinicians have described the occurrence of this anomaly in patients with low backache.<sup>2-5</sup> Sacralization results in a number of sequelae some of which are the development of early

Lumber spondylosis ,lumbar disc herniation , facet joint arthropathy ,spondylolisthesis and spinal canal stenosis, all of which result in low back pain<sup>6-8</sup>. The mechanism leading to all these changes is due to decreased movement at the level below and hyper mobility at the level above due to stress concentration on L4-L5.<sup>9,10</sup> Reporting of sacralisation is otherwise also important for patients who are to undergo any kind of intervention or spinal surgery so as to avoid doing so at an incorrect level.

## MATERIALS & METHODS

### Operational Definitions:

Sacralisation: Assimilation of L5 to Sacrum.

Spondylosis: Degeneration of disc spaces between vertebrae.

**Hypothesis:** Sacralisation is the root cause of low backache in young adults.

**Inclusion criteria:** Patients with a history of recurrent backache in their late thirties or early forties.

### Exclusion criteria:

1. Patients who are body builders and athletes.
2. Patients who had undergone hysterectomy and bilateral salpingo-oophorectomy.

### Data Collection:

First 200 patients referred to Radiology Department during the study period with the presenting complaint of low backache and advised MRI. X Ray Lumbosacral Spine AP and Lat Views were done. MRI was performed on 1.5 Tesla TOSHIBA Scanner to augment the X Ray findings and for better soft tissue characterization. Sections were obtained in Axial and Sagittal planes on both T1WI (short TR and TE) and T2WI (long TR and TE) sequences.

### Data Interpretation and Analysis:

SPSS version 18 was used to enter the data and simple percentages were calculated and compared with the studies done elsewhere.

## RESULTS

200 patients were selected having backache who had X-Ray or MRI of Lumbosacral Spine done. 62% (n=124) patients were male and 38% (n=76) patients were female.

Sacralisation was observed in 98% patients (n=196). Small/rudimentary disc at L5-S1 was noted in 95% cases (n=190). Complete fusion of L5 to S1 in 3% cases (n=6). Broadened transverse processes leading to extraforaminal stenosis in 8 % cases (n=16). Spinal Canal stenosis due to disc herniation (protrusion, extrusion, herniation) was seen in 36% cases (n=72). Facet joint arthropathy was seen in 65% patients (n=130). Spondylolisthesis was seen in 15% case (n=30). Additional degenerative changes were seen at L3-L4 and L4-L5 levels in 55% cases (n= 110), in the form of end plate sclerosis, reduced disc height and osteophyte formation.

## DISCUSSION

At the lumbosacral junction, stability and strength is not only provided by bony articulation but it is also strengthened by the presence of muscles and ligaments. Once the pseudoarticulation occurs, axis of the weight bearing is disturbed leading to a setting in of premature degenerative changes.<sup>11</sup> There is excessive movement at L4-L5 levels leading to premature osteoarthritis manifested as facet joint arthropathy, end plate sclerosis, reduced disc heights and osteophyte formation.<sup>11,12</sup> Similar observations were made in our study as well. Broad and elongated transverse processes of L5 with partial fusion to rudimentary disc further augmented the clinical symptoms. Small/rudimentary disc was noted at the lumbosacral junction by other observers as well.<sup>13</sup> Disc herniation, foraminal stenosis and nerve root entrapment leading to spinal canal stenosis are the sequelae observed in our study as well as that of Epstein et al.<sup>14</sup> Disc protrusion/herniation results in mechanical pressure over the spinal canal which results in pain.<sup>15</sup> Additional degenerative changes at the level of L4-L5 were seen in 55 % cases in our study whereas similar observation was made in the study conducted by Elster.<sup>16,17</sup> Sacralization at lumbosacral junction is also sometimes manifested as anterior slippage of L4 over L5 known as spondylolisthesis secondary to fracture of pars interarticularis as documented by some authors<sup>10,18,19</sup> Similar observation was also made in the present study as well as by Kim and Suk.<sup>20</sup> Overall incidence of sacralisation in our study was 96% whereas in studies conducted by other authors it was only 36%.<sup>21</sup> This reveals the variation that is present in this condition and hence the problem of documentation.

## CONCLUSION

Identification of a transitional vertebra is important in young adults as it is a common cause of low backache. Its significance is further increased before undergoing surgery or any other interventional procedure so as to define the correct level intervention.

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