

## INFLUENCE OF LOW BACK PAIN ON FUNCTIONAL ACTIVITY IN LUMBAR SPINAL STENOSIS PATIENT

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### **Abstract**

Low back pain is the most common ailment associated with postural imbalance. When the spinal canal narrows due to degenerative changes in the spine, the lumbosacral nerve root is compressed or ischemia occurs.

**Objective** Influence of low back pain on functional activity in lumbar spinal stenosis patient.

**Methodology** A total of 370 participants with low back pain were enrolled in the study. 6 months or older cases of lumbar spinal stenosis were included from different rehabilitation centers, hospitals of Lahore and through home visits. Age group of 40 to 70 years was included. Non-probability convenient sampling was used to perform a cross-sectional survey. The visual analogue scale and the Oswestry disability index were used to assess pain and disability. Data analysis was done by SPSS Statistics 23.

**Results** 370 individuals included males and females were selected for this study. Visual analog scale and Oswestry disability index was used for pain and disability. Mean age of Visual analog scale was 5.77 and mean age of Oswestry disability index was 2.05. Pearson correlation test was used. The results of Visual analog scale and Oswestry disability index was highly significant because  $P > 0.05$  hence, low back pain is correlated with lumbar spinal stenosis patient.

**Conclusion** Low back pain influenced the functional activity but also the lower extremity pain may affect the functional activity in Lumbar spinal stenosis patients.

**Indexed terms-** low back pain, lumbar spinal stenosis, visual analog scale, Oswestry disability index, neurogenic pain

### **I. INTRODUCTION**

Lumbar spinal stenosis is defined as the narrowing of the spinal canal that causes pressure on the nerves root or spinal cord leading to the pain in leg and back. The main causes of spinal stenosis are inter-vertebral disc herniation, spondylolisthesis, hypertrophy of ligamentum flavum and facet joint. It is the most common spinal disorder in older population.<sup>(1)</sup> Spinal stenosis doesn't always require surgery but decompression is the most common type of spinal surgery.<sup>(2)</sup> The annual prevalence of lumbar spinal stenosis in 100,000 individuals is five cases which is higher than the prevalence of cervical spinal stenosis.<sup>(3)</sup> The neural foramina, the central spinal

canal, and the space under the facet joints (subarticular stenosis) can all become narrowed.<sup>(4)</sup> Symptomatic lumbar spinal stenosis is caused by nerve root compression and can be classified into several distinct entities based on the underlying causes of the spinal nerve-root compression.<sup>(5)</sup> Spinal stenosis at lumbar level is classified on the basis of location of the narrowing either in the lateral or the central canal or of the etiologies of the stenosis which is either primary or secondary.<sup>(6)</sup> Lumbar spinal stenosis is also associated with other conditions such as diabetes mellitus, osteoporosis and fracture.<sup>(7)</sup> In contrast to radicular pain, such as sciatica, mechanical or chemical irritation caused by the neural compression in the central canal.<sup>(8)(9)</sup> It's a condition that has a variety of causes and affects a wide range of people. Low back pain is a prevalent condition in the United States, with an estimated incidence of 8% to 56%. Heavy physical labor has been associated to the development of low back pain, hence males in physically demanding employment had the highest prevalence of low back pain.<sup>(10, 11)</sup> However, it is yet unclear how sensorimotor, balance, and physical performance, all of which are likely to be impacted by lumbar spinal stenosis, and are linked to functional limitations in this patient population.<sup>(12)</sup> The most commonly used spine imaging tests in primary care include computed tomography, low-cost plain radiography, computed tomography, magnetic resonance imaging, and bone scanning. Spondylolysis, facet joint abnormalities, congenital malformations, and moderate scoliosis are just a few of the examples.<sup>(13)</sup> Patients with LSS are identified and referred to physical therapy based on clinical evaluation and magnetic resonance imaging findings.<sup>(14)</sup> Rest was the first option for relieving low back pain. Physical therapy methods, such as hot packs, disposable body warmers, and baths, are also used to treat low back pain. Pelvic traction is a traction force applied to the lumbar spine that is very successful in the treatment of lumbar inter-vertebral disc hernia. Exercise therapy is a type of treatment that includes a variety of exercises.<sup>(15)</sup> In physical therapy practice, patient education is crucial. The patient should be encouraged to observe activities and situations that may cause discomfort or issues, which should be discussed with the therapist in order to determine the best mobility and

relaxing positions.<sup>(16)</sup> Aim is to determine the influence of low back pain on functional activity in lumbar spinal stenosis patient.

**II. MATERIALS AND METHODS**

This cross-sectional study was conducted using non probability convenient sampling. Data were collected from pulse medical complex, AI - Nasar poly clinic and REX clinic. Data was also collected through self-visits in from hospitals of Lahore. Data was collected from May 2021 to September 2021 after the approval of synopsis. A sample size of 370 was calculated from Cochran's formula.<sup>(17)</sup> Both gender patient with lumbar spinal stenosis with age between 40-70 years and physically inactive patient were included. Patients with any neuro condition, pain and disability at other joints, psychological disorder, peripheral vascular disease, who are not willing and using any painkillers or not any anti-depressant were excluded. Data was collected in person through representatives appointed in selected hospitals. In this particular study, Visual Analog Scale and Oswestry Disability Index were used as a data collection tools. Visual analog scale is a convenient and simple method of measuring pain.<sup>(18)</sup> This scale contains a line of 10 cm with statement on left (no pain) and right (severe pain). Patient is asked to mark according to the pain they feel.<sup>(19)</sup> The Oswestry Disability Index (ODI) is an effective method for measuring disability in low back pain patients. This questionnaire includes 10 six-point scale.<sup>(20)</sup> The score of the sum of 10 ODI is the percentage of the maximum scores. The first section indicates the pain intensity and the remaining 9 section indicates the disabling effect of pain on typical daily activities i.e. washing, dressing etc.<sup>(21)</sup> Data was analyzed by using IBM SPSS V 23. Pearson Correlation test was used for data analysis.  $p < 0.05$  was considered significant.

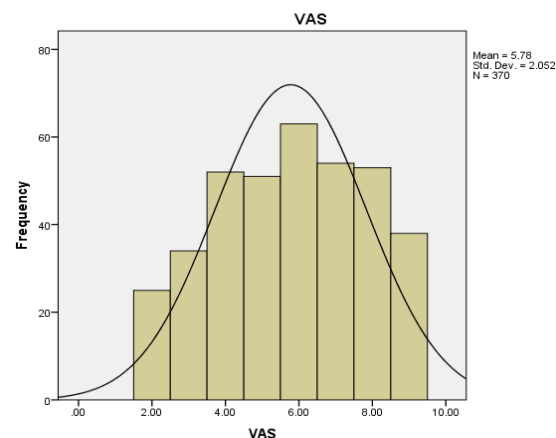
**III. RESULTS**

Results show that there was higher percentage of severe disability in lumbar spinal stenosis patient. Hence, figure no 1 showed the mean score of VASA was  $5.77 \pm 2.05$ , and the figure no 2 showed mean score of ODI was  $53.78 \pm 10.00$ . Table no 1 showed that correlation between VAS and ODI was significant as  $P > 0.05$ .

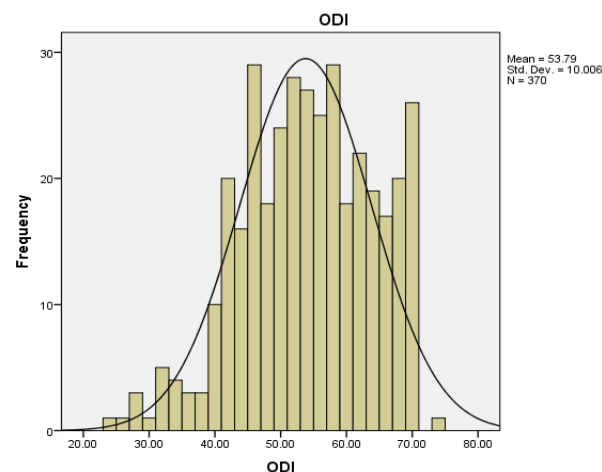
**Table-1: Correlation between VAS and ODI.**

		VAS	ODI
VAS	Pearson Correlation	1	.106*
	Sig. (2-tailed)		.041
	N	370	370
ODI	Pearson Correlation	.106*	1
	Sig. (2-tailed)	.041	

N	370	370
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**Fig. 1: Histogram of VAS**



**Fig2: Histogram of ODI.**

**IV. DISCUSSION**

This is a cross sectional study and includes the 370 individuals including males and females of age between from 40 years to 70 years. This study found that not only the lumbar spinal stenosis is prevalent but also low back pain is strongly associated with it. Because of this prevalence and association low back pain should be treated for better prognosis in population with lumbar spinal stenosis.

Another study was conducted in 2020 by Jensen et all in which the prevalence of degenerative LSS is rarely seen in patient below 50 years but in our study, there is a high prevalence of LSS seen as the patient age above 40 years.<sup>(22)</sup> In 2020, Galliker et all conducted a study in which the prevalence of spinal pathologies was higher in patient with low back pain. According to this study vertebral fracture was prevalent (0.0-4.2 %), cancer (0.5-2.1 %), and spinal cord compression (1.9 %) but our study found the higher prevalence of degenerative changes that

influence the low back pain in LSS.<sup>(23)</sup> Another cross-sectional study was conducted in 2020 by Aldera et al in which the low back pain not only affect the quality of life but may also cause stiffness to back and caused problems in standing straight position. This study also stated that the prevalence of low back pain in more in males than in females but according to our study low back pain mainly affects the female of age 40 to 70 years.<sup>(24)</sup>

In 2018 a study was conducted by Backstrom et al in which the study indicated that as the person ages there was an increase in the number of people seeking medical help for discomfort and limited activities caused by LSS. The patient suffering from LSS have moderate pain in low back and in lower extremities. In contrast to our study the low back pain is strongly associated with LSS and according to our result that has been statistically proved the there is a severe disability in LSS patients.<sup>(25)</sup> The limitation of the study was pain perception is different for different people so pain cannot be recorded accurately. As in females pain perception was different than in males.

Recommendations:

While it is recommended that in the future further studies should also be done on this topic with different population sizes and in different regions, Comparative studies should be done across different age groups of lumbar spinal stenosis patient, Studies in future should include a control group too and non-neurological populations can also be targeted in the future.

## V. CONCLUSION

Low backpain associated with LSS and shows the severe disability in patient with LSS. Hence, the influence of low back pain on functional activity is mostly seen in older females due to the degenerative changes in lumbar spine.

### Conflict of Interest

There was no conflict of interest.

### Financial Statement

No fundings were given by any authorities; it was a project thesis of doctor of physical therapy.

### Data availability

Data will be provided on the demand by corresponding author.

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