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Effectiveness of Physiotherapy on Reducing Numbness and Paresthesia of Lower Limb among Lumbar Disc Prolapse Patients at Rania District

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Abstract:

The five lumber vertebrae are a part of vertebral column and illustrated from vertebrae in further sections by their large size. Lumbar disc prolapses ('slipped disc') accounts for less than 5% of all low back problems, but is the most common cause of nerve root pain ('sciatica'). Ninety percent of acute attacks of sciatica settle with conservative management. Quasi experimental pretest posttest design study conducted among 100 patients with sciatic pain and low back pain during the period of 13 December 2021 to 1 September 2022 to evaluate the effectiveness of physiotherapy on reducing numbness and paresthesia of lower limb among patients with lumber disc prolapse at Rania District. The data of the study, collected by utilized constructed questionnaire form, which composed of the two parts; first part included questions about the sociodemographic characteristics of the study sample, while second part consist of presenting (back pain and sciatic pain before starting physiotherapy and the percentage of remaining these

complains after finishing sessions of physiotherapy). The data of the study collected in Rania city among 100 patients by using constructed questionnaire, interview technique (face to face method) with the study sample. Data were analyzed by using SPSS V21 software program to produce descriptive analysis such as (percentage and frequency). For the current study data were collected from 100 patients that suffered from Lumber 4 and Lumber 5 disc prolapse, age of the majority of patients between 50 to 69 years old. And female more than male, most of them were obese, and presenting chronic back pain. Only a few number of the study sample had history of laminectomy. Most of the study sample were free from back pain, while all of the samples had sciatic pain before physiotherapy, and after physiotherapy the range of back pain decreased and regarding sciatic pain dramatically reduced among the majority of participants.

Keywords: Disc prolapse, Physiotherapy, Sciatic pain, Lumber disc prolapse

Introduction:

The five lumber vertebrae are a part of vertebral column and illustrated from vertebrae in further sections by their large size. Also they absence of facets for join with ribs. The transverse processes are usually thin and long, with the exclusion of those on lumber vertebrae, which are huge and slightly cone shaped for the attachment of iliolumbar ligaments to attach the transverse processes to the pelvic bones. The vertebral body of the typical lumber vertebrae is cylindrical and the vertebral foramen is triangular form and larger than in the thoracic vertebrae (Darke, *Et al*., 2020). The intervertebral disc is a cartilaginous plate the forms a cushion between the vertebral bodies. This tough, fibrous material incorporated in a capsule. A ball like cushion in the center of the disc the nucleus pulposus. In prolapse the intervertebral disc ruptured and the nucleus of the disc protrudes into the fibrous ring around the disc, with subsequent nerve compression. For most patients, the immediate symptoms of trauma are short-lived, and those resulting from injury to the disc do not appear for months or years. Then, with degeneration in the disc, the capsule pushes back into the spinal canal, or it may rupture and allow the nucleus pulposus to be pushed back against the dural sac or against a spinal nerve as it emerges the spinal column. This sequence produces pain due to pressure in the area of distribution of the involved nerve endings (radiculopathy). Continued pressure may produce degenerative changes in involved nerve, such as changes in sensation and deep tendon reflux (Farrell, 2016). Disc prolapses can result from various complex load situations and degenerative changes in the intervertebral disc (Schmidt, *et al*., 2007).

The most common manifestations of lumber disc prolapse is low back pain. Radicular pain that radiated down the buttock and below the knee along the distribution of sciatic nerve, while the specific manifestations vary depending on the location of ruptured intervertebral disc, in L3-4 the patient feel a pain in the back to buttocks to posterior thigh to inner calf, in L4-5 the pain has felt in the back to buttocks to dorsum of foots to big toe, while if the prolapse occurred at L5-S1 level the patient feel pain from back to buttocks to sole of foot and heel (Harding, Et al., 2020).

Lumbar disc prolapses ('slipped disc') accounts for less than 5% of all low back problems, but is the most common cause of nerve root pain ('sciatica'). Ninety percent of acute attacks of sciatica settle with conservative management. Absolute indications for surgery include progressive leg muscle weakness and altered bladder function, but these are rare. The usual indication for surgery is to provide more rapid relief of pain and incapacity in the minority of patients whose recovery is unacceptably slow (Gibson, *et al*., 2000).

The onset of pain may be sudden or gradual, and it increases by coughing or straining but may be relieved by lying flat. The investigations that need for diagnosing exact disc prolapse includes MRI which is the investigation of choice if available, since soft tissue are well imaged. Plain X-Rays of the lumber spine are of little value in the diagnosis of disc disease, although they may demonstrate condition affecting the vertebral body. CT can provide helpful images of the disc protrusion and/or narrowing of exit foramina (Ralston, *et al*., 2018).

For treating cases have many modalities for treatment back pain, extracorporeal shock wave therapy one of them are used for chronic low back pain cases with physical therapy two times per a week for six weeks is an effective intervention for the treatment of pain, disability, and depression in chronic low back pain patients (Yue et al., 2021). Electrotherapy is commonly used for treatment of chronic low back pain. Especially transcutaneous electrical nerve stimulation (TENS) (Thiese *et al*., 2013). And manual spinal traction therapy has effective on back pain (Oh *et al*., 2018).

Acute low back pain may be related with a disc prolapse in the lumbar spine, a pulled back muscle; piriformis syndrome, and transferred pain from the sacroiliac joint. Herniated Disc of the lumbar spine usually effects in the rapid and severe onset of back pain and improbability to dismissed by changing position but it can be made worse by bending and prolonged sitting. Disc Bulges occur most often between the fourth and fifth lumbar vertebral bodies (L4 & L5) or under the fifth lumber and the sacrum number one (L5 & S1). Physiotherapy is objective to falling the grade of inflammation, by joining mobilization and soft tissue release integrated with low-back strengthen exercises (Hides, *et al*., 2008).

Aim of the study:

1. To identify sociodemographic characteristics of the study sample.

2. To find out the effectiveness of physiotherapy on reducing numbness and paresthesia of lower limb among disc prolapse patients.

Method and patients:

Quasi experimental pretest posttest design study conducted among 100 patients with sciatic pain and low back pain during the period of 13 December 2021 to 1 September 2022 to evaluate the

effectiveness of physiotherapy on reducing numbness and paresthesia of lower limb among patients with lumber disc prolapse at Rania District.

Inclusion criteria: All patients suffering from Lumber 4 and Lumber 5 (L4 & L5) disc prolapse presenting with sciatic pain and back pain and agree to participating in this study.

Exclusion criteria: Piriformis syndrome, Spondylolisthesis, other lumber (L1, L2, L3) disc prolapse.

The data of the study, collected by utilized constructed questionnaire form, which composed of the two parts; first part included questions about the sociodemographic characteristics of the study sample which includes (Age, gender, BMI, duration of back pain and history of laminectomy) , while second part consist of presenting (back pain and sciatic pain before starting physiotherapy and the percentage of remaining these complains after finishing sessions of physiotherapy).

Validity of the study tool, was done by 10 experts in different universities to knowing the need of some manipulation of questions.

Pilot study was done among 10 patients with lumber disc prolapse patients which included from the study sample to identify the clarify of the questions, estimated time, barriers of data collection, and to find out the reliability of the study tool which is 0.82.

The data of the study collected in Rania city among 100 patients by using constructed questionnaire, interview technique (face to face method) with the study sample.

Statistical analaysis:

Data analysis, by using SPSS V21 software program to produce descriptive analysis such as (percentage and frequency).

Result:

For the current study data were collected from 100 patients that suffered from Lumber 4 and Lumber 5 disc prolapse presenting with sciatic pain and back pain, presenting with numbness and paresthesia of lower limb. The age of participants was ranged from 10 to 89 years old and the majority of patients between 50 to 69 years old. Table 1.

Regarding the gender of the patient, most of the study samples were female 65 (65%)comparing to male 35 (35%), and among females only 9 (14%) of them were pregnant. Then about BMI the majority of them were classified as an obese person 60 (60%), 17 (17%) were overweight, 15 (15%) were classified as normal body mass index and only 8 (8%) of them were underweight. Table 1.

About the duration of back pain 87 (87%) of the study sample were had chronic back pain and only 13 (13%) of them had acute back pain. Among them only 15 (15%) of them had history of laminectomy and 85 (85%) didn't do any laminectomy. Table 1

The back pain presented among 20 (20%) of samples while 80 (80%) of them were free from back pain before physiotherapy, and regarding sciatic pain all of the study samples 100% had sciatic pain, before physiotherapy. Table 2.

After physiotherapy back pain remains among 15 (15%) of the study samples, while 81 (81%) of the study samples recovered from sciatic pain, and the sciatic pain remains among 19 (19%) of the study sample after finishing sessions of physiotherapy. Table 3.

Table (2): Distribution of the demographic characteristics

Variable	Categories	Frequency	Percentage
Age	**10-29**	**10**	**10%**
	30-49	**38**	**38%**
	50 - 69	**40**	**40%**
	70 - 89	**12**	**12%**
	Total	**100**	**100%**
Gender	**Male**	**35**	**35%**
	Female	**65**	**65%**
	Total	**100**	**100%**
Are You Pregnant	**Yes**	**9**	**14%**
	No	**56**	**86%**
	Total	**65**	**100%**
Body Mass Index	**Under Weight**	**8**	**8%**
	Normal	**15**	**15%**
	Over Weight	**17**	**17%**
	Obese	**60**	**60%**
	Total	**100**	**100%**
Duration Of Back Pain	**Acute**	**13**	**13%**
	Chronic	**87**	**87%**
	Total	**100**	**100%**
History Of	**Yes**	**15**	**15%**
	No	**85**	**85%**

Laminectomy	**Total**	**100**	**100%**

Table 2: Frequency of presenting Back pain and sciatic pain before physiotherapy

Before Physiotherapy	Categories	Frequency	Percentage
Back Pain	**Yes**	**20**	**20%**
	No	**80**	**80%**
	Total	**100**	**100%**
Sciatic Pain	**Yes**	**100**	**100%**
	No	**0**	**0%**
	Total	**100**	**100%**

Table 3: Frequency of presenting Back pain and sciatic pain After physiotherapy:

After Physiotherapy	Categories	Frequency	Percentage
Back Pain	**Yes**	**15**	**15%**
	No	**85**	**85%**
	Total	**100**	**100%**
Sciatic Pain	**Yes**	**19**	**19%**
	No	**81**	**81%**
	Total	**100**	**100%**

Discussion:

Throughout the course of data analysis of the present study, the findings indicated that most of study samples (40%) were middle age group between 50-69, (Osterman *et al*., 2006) disagree with this finding and found that age of most study samples were between (20-50) years of age. And about gender most (65%) of the samples were female, while the samples of (Sutheerayongprasert *et al*., 2012) study were mostly (65%) male. And among females only a few (9%) cases were pregnant, this finding comes along with the (Campbell and Muncer, 2005) who found that only a few numbers (6.1%) among females were pregnancy and childbirth made a back pain.

Regarding weight of patients, the present study found that most of the study samples were in obese class and their body mass index were equal and greater than 30, (Rihn, *et al*., 2013) agree

with this finding and found that obesity has an effects on many problems like musculoskeletal and spinal disease, including low back pain. Most of the study samples (87%) had a chronic back pain

And only 15% of them were used surgery for treating them complains, this finding comes along with the (Weinstein *et al*., 2007) who stated that most of the study samples received non operated treatment for reducing them complain.

Regarding the pain in cases with lumber disc prolapse, the findings of present study reach the results that total samples had sciatic pain while only 20% of them had a back pain. This finding not comes along with (Hasue and Fujiwara, 1979) who found that low back pain is more frequent than sciatic pain before using any surgical and non-surgical treatment.

About the presence of pain, the study found that the pain was made uncomfortable life for disc prolapse patients (Table 2) before physiotherapy, this finding supported by the findings of Chen and Tsai 2013 (Chen and Tsai, 2013) who found that the most significant factor affecting the incapacity and uncomfortably life style was the pain.

After physiotherapy the finding of the present study reported that most of the samples were got benefit from different styles of physiotherapy, this finding agree with the Li, and Bombardier, (2001) (Li and Bombardier, 2001) which mentioned that most of samples were had a good prognosis after completing sessions of physiotherapy for reducing signs of lumber disc prolapse.

Conclusions:

Based on the results of the study, researchers conclude that: the lumber disc prolapse was more common among old age groups, and female more affected than male, with an obese class BMI.

Most of study sample had a chronic back pain and only a little number of them had a history of laminectomy. In addition, all the samples had a sciatica but only few of them had back pain before physiotherapy, while after physiotherapy most of study samples had a good prognosis and the un-comfort sensations were disappearing among most of them.

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