



International Journal of Allied Medical Sciences and Clinical Research (IJAMSCR)

ISSN:2347-6567

IJAMSCR |Volume 6 | Issue 2 | Apr - Jun - 2018
www.ijamscr.com

Research article

Medical research

Prevalence of foot drop in lumbar degenerative disease

Nausheen Sajid Khan*¹, Dr.Neha Ingale², and Dr. Sachin Chaudhary³, Nikhil Patil⁴

¹B.PTh intern, Dr,Ulhas Patil College of Physiotherapy, Jalgaon

²Associate Professor, Dr.Ulhas Patil College of Physiotherapy, Jalgaon

³Professor, Dr.Ulhas Patil College of Physiotherapy, Jalgaon

⁴M.PTh student, Dr.Ulhas Patil College of Physiotherapy, Jalgaon

*Corresponding Author: Nausheen Sajid Khan

Email id: nsheen55@gmail.com

ABSTRACT

The purpose of this study is to find out prevalence of foot drop in lumbar degenerative disease. 100 patients suffering from lumbar degenerative disease were included in the study between age group of 25-55 years from both genders. The medical research council scale was used, to evaluate the strength of tibialis anterior muscle by performing manual muscle test. Data was collected and Statistical Analysis was done by calculating its mean. In this study The Prevalence of Foot Drop in Lumbar Degenerative Disease was 8% and found out that most of the foot drop patient resulted from ignored cases of Lumbar Spinal Stenosis and Prolapse Intervertebral Disc out of which most of them were males with farming occupation and most of them suffer unilaterally.

Keywords: Foot Drop, LDD (lumbar degenerative disease), Medical research council scale.

INTRODUCTION

India is a country with a huge human resource been utilized for labour and also is a country of diversity in culture and religions. Thus, we have numerous activities which involve bending and twisting of the spine. Therefore, we expect more disc degeneration and disc herniation compared to the western world. [3, 4] Degenerative disc disease (DDD) describes the natural breakdown of an intervertebral disc of the spine. [9] Disc degeneration is often the effect of natural daily stresses and minor injuries that cause spinal discs to gradually lose water as the annulus, or the rigid outer shell of a disc, weakens. As discs weaken and lose water, they begin to collapse. This can result in

pressure being put on the nerves in the spinal column, causing pain and weakness. [11] While not always symptomatic, DDD can cause acute or chronic low back pain as well as nerve pain depending on the location of the affected disc and the amount of pressure it places on the surrounding nerve roots. [10] There are number of lower back problems that put pressure on the nerve leading to the peroneal nerve [3, 11] The Peroneal Nerve starts below the knee and runs along the outside of the leg. It runs down into the ankle, foot and the big toe and first toe. It is responsible for providing nerve sensation and communicating problem instructions to those areas. [1-5] For example, the peroneal nerve connects to Tibialis Anterior Muscle that allows the foot and toes to dorsiflex.

Any impingement or damage to peroneal nerve can cause foot drop.^{5,6} Lumbar degenerative disease (LDD) including lumbar disc herniation (LDH), prolapsed intervertebral disc (PIVD) and lumbar spinal stenosis (LSS) is a common aetiology for low back pain and leg pain.⁴

Herniation

It is a general term used when there is any change in the shape of the annulus that causes it to bulge beyond its normal parameter. Pressure on the weak spot of the disc causes pain to the nerve and run below the knee and foot and it causes foot pain and foot drop.

Prolapse

It is frank rupture of the nuclear material into the vertebral canal. It causes foot drop same as of herniation. [12, 15]

STENOSIS

It is the narrowing of the open spaces of lumbar canal due to degeneration of vertebrae, discs, muscles and ligaments. It causes nerve compression and inflammation which can produce symptoms of pain, especially with activities involving standing and walking. [12, 13, 15] Lumbar Degenerative Disease also includes compression or inflammation due to stenosis (either from bony spurs, ligamentum flavum thickening or facet arthropathy).

It develops in areas of inflammation or injury of nearby cartilage or tendons. Ligament Flavum Thickening: A ligamentum flavum is one of the tough bands of tissue that connect the vertebrae and provide stability. A thickened ligamentum flavum is one of several degenerative spine conditions that could produce painful nerve compression, as we

reach middle age. Facetal Arthropathy: It is degenerative disease that affects the joints of the spine and cartilage breakdown of those joints. Heavy lifting, improper posture, and disc problems are some of the factors that cause the cartilage to wear down. Spondylolisthesis: It is a condition in which one vertebra slides forward over the lower vertebra, resulting in a pinched or inflamed nerve in the lower back.

Depending on where the nerve is affected the symptoms run all the way down to foot. [3, 4, 12, 13] LDD is frequently seen in elderly patients and can results in severe symptom, such as lower back pain, buttocks or upper thighs, tingling, numbness, intermittent claudication and sensation defect of lower limb. [4] Foot drop is characterized by the inability or difficulty in moving the ankle and toes upward (dorsiflexion). [4] It is a prominent presentation of number of clinical disorder. The inability of ankle dorsiflexion and consequent limping gait may lead to multiple falls and injuries, resulting in substantial impairment of mobility and quality of life. [11] It is a sign of an underlying neurological, muscular, anatomical or spinal problem. [4] Among the numerous spinal causes of foot drop, the most common is lumbar degenerative disease. Foot drop due to degenerative lumbar diseases is an entity substantially different from that of peripheral neuropathy. [3, 4] Foot drop also causes due to antigravity weakness of the tibialis anterior muscle which is a common debilitating condition secondary to lumbar nerve root deficiency, and one of the causes is compression or inflammation due to stenosis either from bony spurs, ligament flavum thickening, facet arthropathy and herniated disc or a prolapsed intervertebral disc. [3]

STRENGTH GRADING FOR TIBIALIS ANTERIOR (TA) MUSCLE

Grade	Description
0	No Contraction Of Tibialis Anterior.
1	Slight Contraction Of Tibialis Anterior is observed, but no joint motion of ankle.
2	Patient can invert and dorsiflex ankle with gravity eliminated through full range of motion.
3-	Patient can dorsiflex and invert ankle against gravity through partial range of motion.
3	Patient can dorsiflex and invert ankle against gravity through full range of motion.

-
- 4 Patient can dorsiflex and invert ankle against gravity and moderate resistance.
 - 5 Patient can dorsiflex and invert ankle against gravity and full resistance.
-

METHODOLOGY

The Observational study in which 100 patients were included in the study suffering from Lumbar degenerative diseases from age group between 25-55 years from both genders .The study conducted at O.P.D. of Dr. Ulhas Patil Medical College &

Hospital, Jalgaon for a period of six months. Patients suffering from spinal deformity or fracture and who underwent surgery before were excluded. Outcome measures: Manual muscle testing was used to grade the strength of Tibialis Anterior (TA) Muscle.

STATISTICAL ANALYSIS

Table No.1:- This table represents total number of patients with lumbar degenerative disease according to different AGE groups and Prevalence of Foot drop among them.

ACCORDING TO AGE GROUP	TOTAL NUMBER OF PATIENTS	PREVALENCE
25 – 30	12	0
30 – 35	8	0
35 – 40	8	0
40 – 45	15	1
45 – 50	17	3
50 – 55	40	4

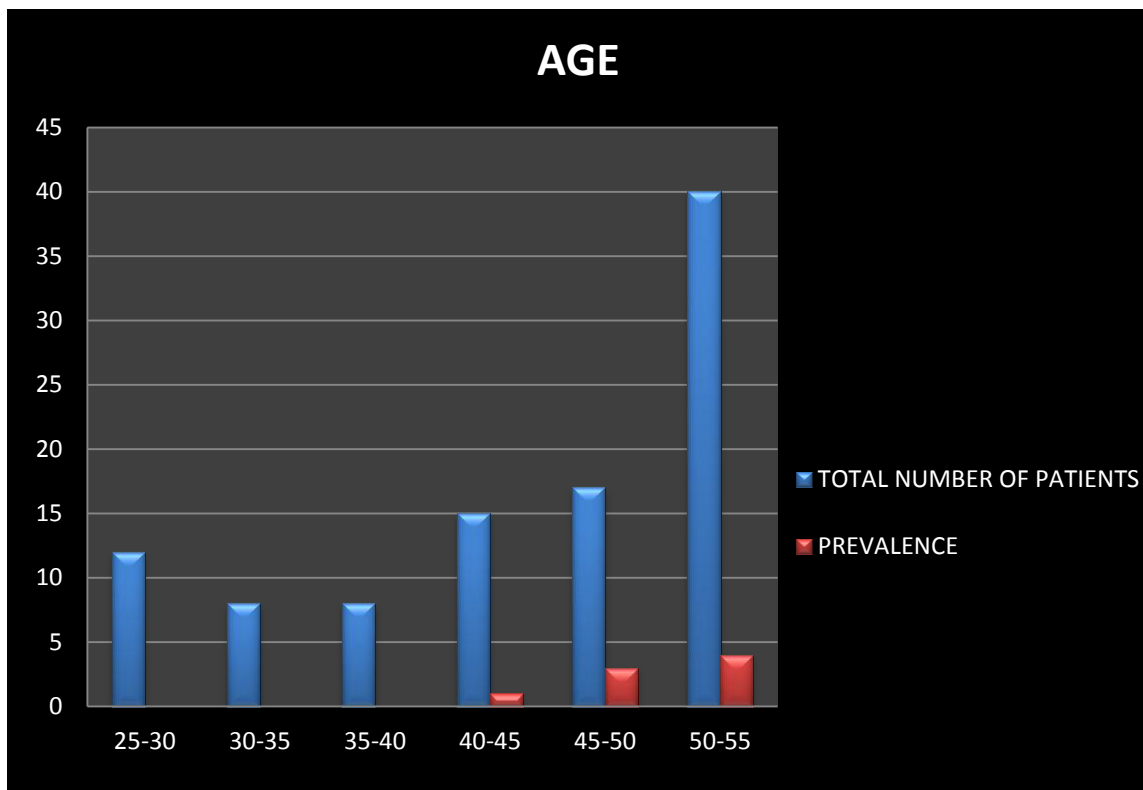


Table No.2:- This table represents total number of patients suffering from lumbar degenerative disease according to their GENDER and Prevalence of Foot drop among them.

GENDER	TOTAL NUMBER OF PATIENTS	PREVALENCE
MALE	51	5
FEMALE	49	3

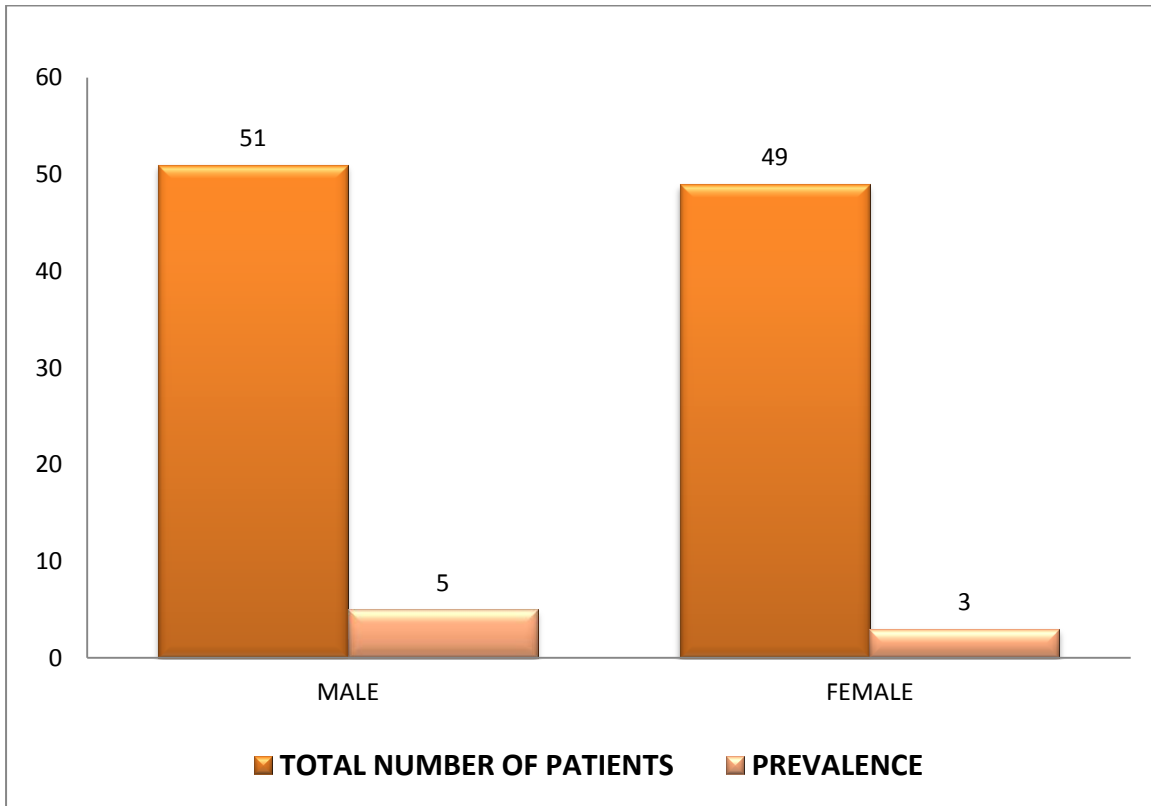


Table No.3:- This table represents total number of patients of lumbar degenerative diseases according to their CAUSES and Prevalence of Foot drop among them.

CAUSES	TOTAL NUMBER OF PATIENTS	PREVALENCE
Facetal Arthropathy	8	0
Herniated Disc	20	1
PIVD	21	3
Ligamentum Flavum Thickening	8	0
Spinal Stenosis	38	4
Spondylolisthesis	5	0

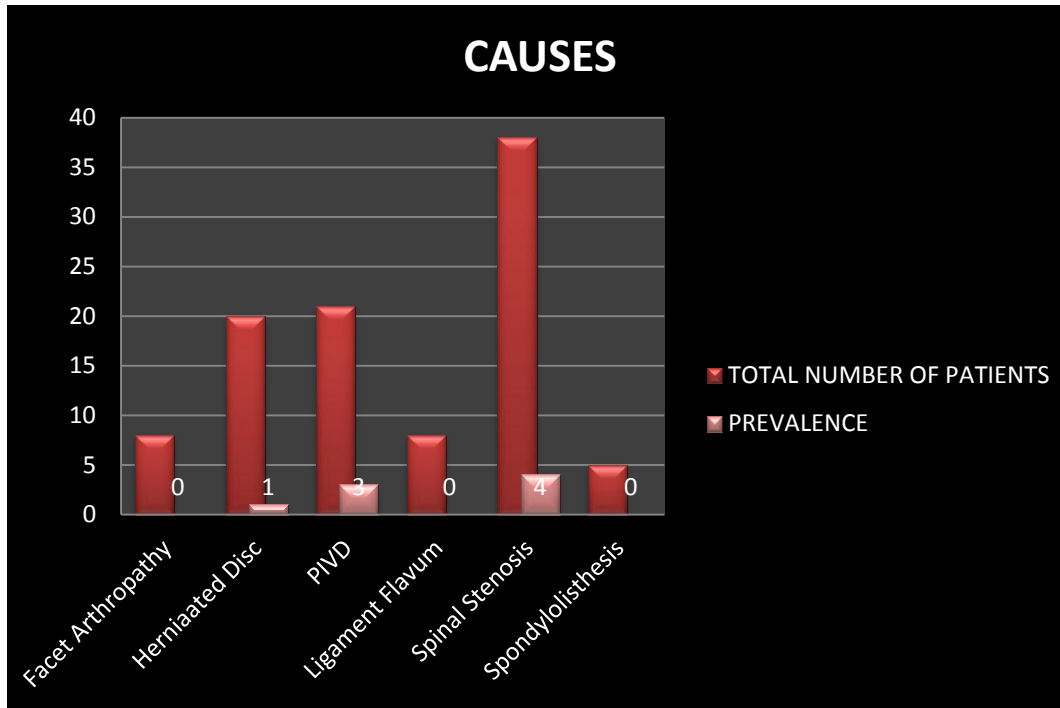
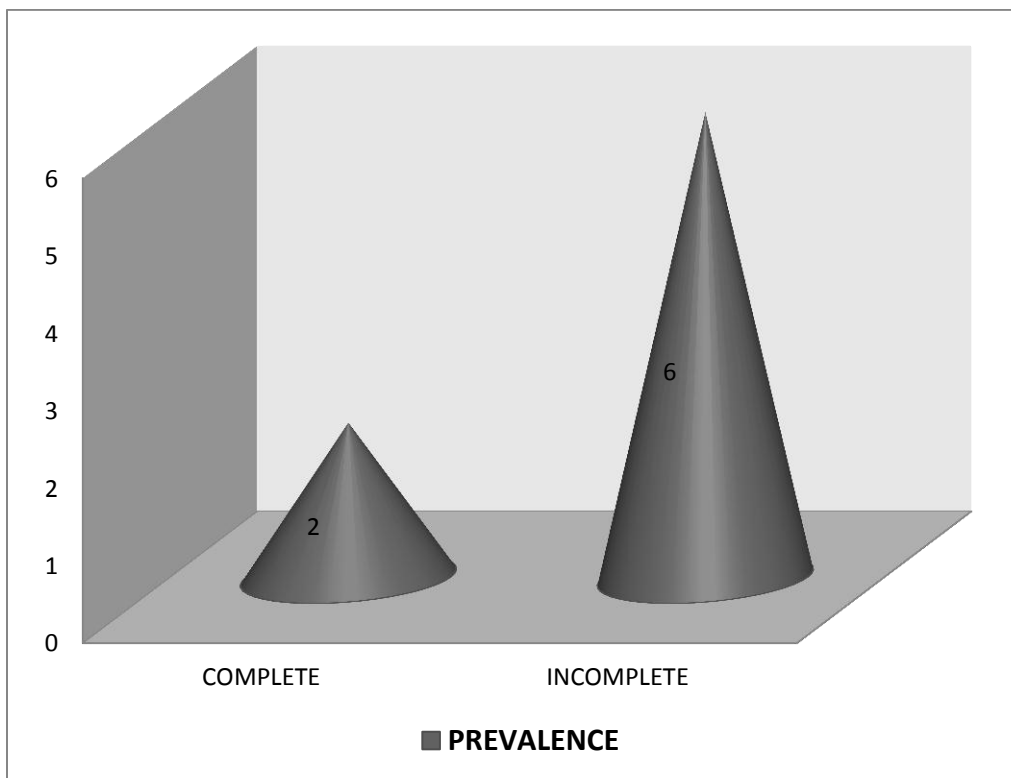


Table no. 4:- This table represents total number of patients of foot drop according to their classification of foot drop.

ACCORDING TO CLASSIFICATION	PREVALENCE
COMPLETE	2
INCOMPLETE	6



It depends on the scale that rate
Tibialis Anterior having MMT = < 3- is said to be
Complete

And having MMT = 3 is said to be incomplete.

Table no.5:- This table represents total number of patients of foot drop according to their type of foot drop.

ACCORDING TO TYPE	PREVALENCE
UNILATERAL	7
BILATERAL	1

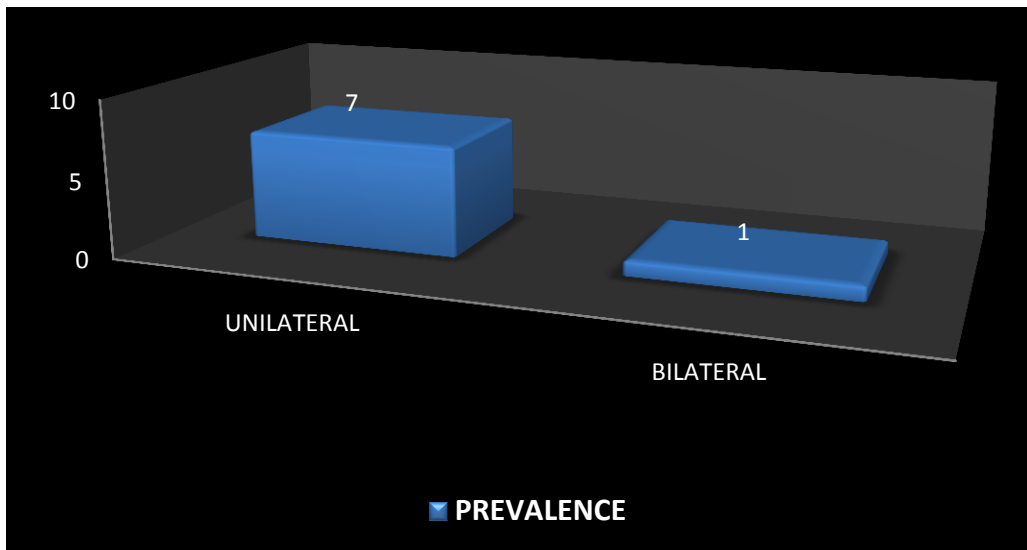


Table no.6:- This table represents total number of patients of foot drop according to their side of foot drop.

ACCORDING TO SIDE	PREVALENCE
RIGHT	4
LEFT	5

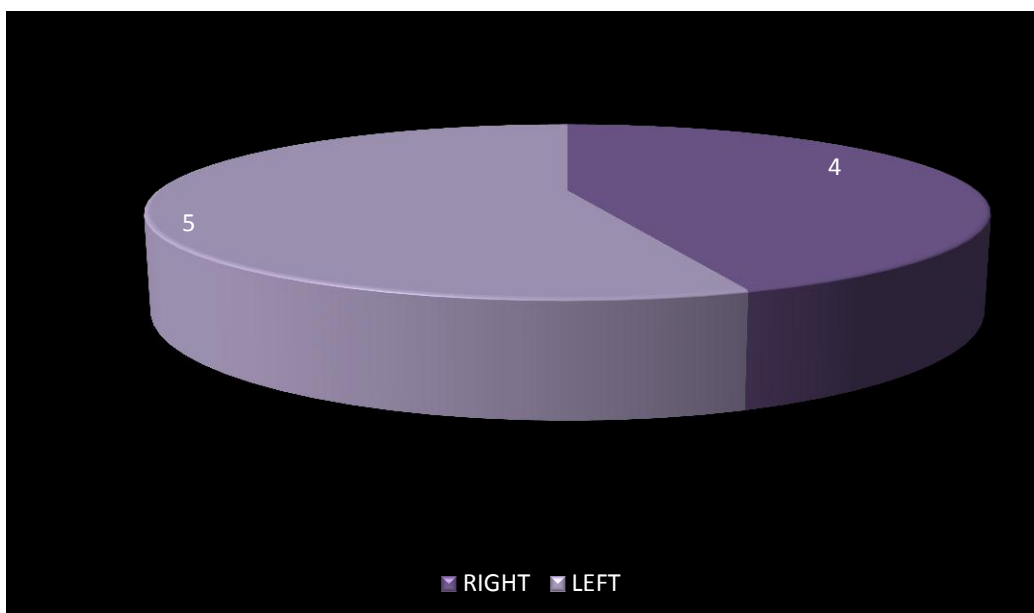
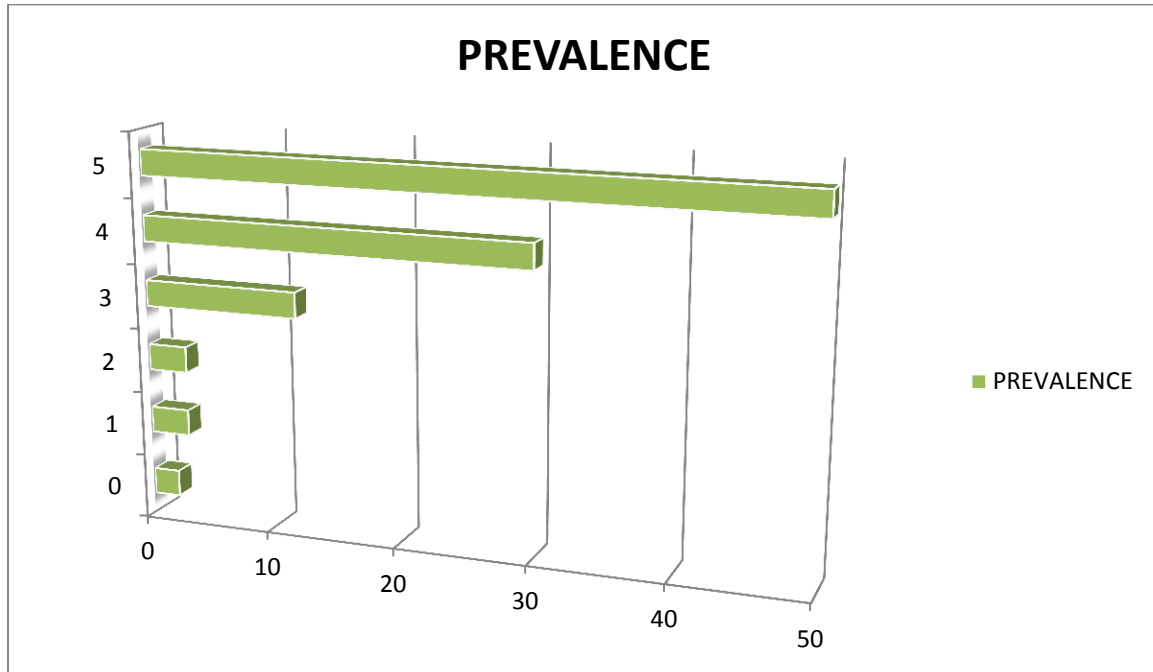


Table no.7:- This table represents according to the grading of tibialis anterior muscle.

According to the grades of Tibialis Anterior Muscle.	
GRADES	PREVALENCE
0	2
1	3
2	3
3	12
4	30
5	50



RESULT

During the survey, the Medical Research Council Scale was used, to evaluate the strength of Tibialis Anterior Muscle by performing Manual Muscle Test. The study consisted of 100 subjects. Evaluation of Strength of Tibialis Anterior muscle was done. Data was collected and Statistical Analysis was done. A detailed specification of patients according to their age groups is shown in,

- Table No: 1 The group consisted of 100 subjects between the age group 25 - 55 years. The Maximum Patients with lumbar degenerative disease were found to be between the age group 50-55 years which was seen to be descending in younger ages. As the age advances, there are more problems rising of Low back pain which gets converted in Degenerative Disease.
- Table No: 2 The prevalence of Foot drop was found to be higher in male patients as compared to female patients. According to the result.
- Table No: 3 Represents the causes of foot drop resulting from lumbar degenerative disease. Such as Facetal Arthropathy, Herniated Disc, PIVD, Ligamentum Flavum Thickening, Spinal Stenosis and Spondylolistheis. The highest prevalence was found to be in Spinal stenosis following PIVD and Herniated disc.
- Table No: 4 Foot Drop may be Complete or Incomplete (Partial), depending on extent of severity. The table represents that there are more cases of incomplete foot drop than that of complete foot drop.
- Table No: 5 Foot Drop may be Unilateral or Bilateral, depending on the root of nerve involve. According to the study evaluation, there are more cases of unilateral foot drop.

- Table No: 6 It is seen that Foot Drop can occur to any of the lower extremity, depending on the side of injury. According to prevalence, there are more cases of left sided foot drop than right sided foot drop.
- Table No: 7 Table states the Grading of Tibialis Anterior Muscles, which is done by performing Manual muscle testing, maximum number of patients i.e.50 patients had grade 5 of Tibialis Anterior muscle that means very good strength, then 30 patients had grade 4 which means good strength, 12 patients had grade 3 which means moderate strength , 3 patients had grade 2 indicating fair strength , 3 patients had grade 1 which means poor strength and 2 patients had grade 0 which means very poor strength.

DISCUSSION

There have been several studies addressing the mechanism of foot drop caused by lumbar degenerative disease but data is still limited and there are some controversies. The aim of the study was to find out prevalence of foot drop in lumbar degenerative disease which was found out to be 8%. The strength of this study are that the clinical data provides insights into the clinical feature of foot drop caused by lumbar degenerative disease and nearly all known factors were included in the analysis to determine which factor influence the cause of foot drop. The clinical features and their cause were analyzed along with their age, gender, strength of Tibialis anterior and classification of foot drop. The Lumbar region is capable of movement in flexion, extension, lateral flexion and rotation. The amount of flexion varies at each interspace of the lumbar vertebrae, but most of the flexion takes place at the lumbosacral joint. During flexion and extension, the greatest mobility of the spine occurs between L4 and S1 which is also the area that support most weight. The sample size was 100 out of which 8 were having foot drop During the evaluation of the survey, It was observed that there were maximum subjects having lumbar degenerative disease and the highest found out to be in 50 – 55 years of age, which is elderly group. This is because Degenerative disc develops as a result of the effects on aging on your spine and specifically on your intervertebral discs. The disc usually become weak due to age, the disc loses its water content and become thinner; both of which

can alter the strength and shape of one or more discs. And also, there are lots of people dealing with low back pain, which remains constant or eventually subsides after some rest period. The low back pain which remains constant for years give rise to Lumbar Degenerative changes which deals with postural dysfunction and lumbar changes. Therefore, it should be suggested that low back pain should not be neglected in any case.

According to evaluation Performa, it was found that there were 51 males and 49 females. Out of all the 51 males, all of them were working (farmers, drivers, shopkeepers etc.) whereas maximum females were housewives. This might be one of the reasons for why the rate of prevalence was higher amongst males than females. Degenerative disc begins with changes in your intervertebral disc but, it will also affect the other motion segment of the spine, such as facet joints. It also reduces the ability to Lumbar degenerative disease including lumbar disc herniation, prolapsed intervertebral disc (PIVD) and lumbar spinal stenosis, is a common aetiology for low back pain. The most causes among lumbar degenerative disease causing foot drop are Facetal Arthropathy, Herniated disc, PIVD, Ligamentum Flavum Thickening , Spinal Stenosis and Spondylolisthesis. Maximum Patients were to found to be of Spondylolisthesis. We used MRC grading for assessment of weakness and defined foot drop precisely as weakness MRC grade <3. And patients having MRC <3- is said to be Complete foot drop And patients having MRC grade = 3 is said to be Incomplete (Partial) foot drop. Foot drop may be unilateral or bilateral. It depends upon the root of nerve involve due to compression or any impingement or damage of the nerve. It may be unilateral or bilateral. But according to my study there are more cases of unilateral foot drop. It was found out that 50% of patients are having good strength of Tibialis Anterior Muscle with Lumbar Degenerative Disease that is grade 5 which is a good factor.

CONCLUSIONS

According to the study evaluation, The Prevalence of Foot Drop in Lumbar Degenerative Disease was 8%. It had been found out that most of the foot drop patient resulted from ignored cases of Lumbar Spinal Stenosis and Prolapse Intervertebral Disc out of which most of them

were males with farming occupation and most of them suffer unilaterally.

Acknowledgments

I would like to thank my parents for the constant support and strength. I am extremely grateful to Dr. Sachin Chaudhary for his advice and help. I express my humble gratitude to Dr.Neha

Ingale under whose expert guidance I was able to successfully complete the study. I am thankful to Dr. Nikhil Patil for his constant support and help. I am also thankful for all teachers for their encouragement and help. Last but not the least, I express my thanks to all my subjects who participated in my study and gave their full cooperation for its completion.

REFERENCES

- [1]. Iizuka Y, Iizuka H, Tautsumi S, et al. Foot Drop due to Lumbar Degenerative Conditions: mechanism and prognostic factors in herniated nucleus pulposus and lumbar spinal stenosis. *J Neurosurg Spine* 10, 2009, 260-264.
- [2]. Ghahreman A, Ferch R D, Rao P, Chandran N, Shadbolt B. Recovery of ankle dorsiflexion weakness following lumbar decompressive surgery. *J Clin Neurosci.* 16, 2009, 1024–1027.
- [3]. Aono H, Iwasaki M, Ohwada T. et al. Surgical outcome of drop foot caused by degenerative lumbar diseases. *Spine.* 32, 2007, E262–E266.
- [4]. Weinstein J N, Tosteson T D, Lurie J D. et al. Surgical vs nonoperative treatment for lumbar disk herniation: the Spine Patient Outcomes Research Trial (SPORT): a randomized trial. *JAMA.* 296, 2006, 2441– 2450. [PMC free article]
- [5]. Andersson H, Carlsson C A. Prognosis of operatively treated lumbar disc herniations causing foot extensor paralysis. *Acta Chir Scand.* 132, 1966, 501–506.
- [6]. Blaauw G, Braakman R, Gelpke G J, Singh R. Changes in radicular function following low-back surgery. *J Neurosurg.* 69, 1988, 649– 652.
- [7]. Saal J A. Natural history and nonoperative treatment of lumbar disc herniation. *Spine.* 21(24), 1996, 2S–9S.
- [8]. Kono H, Nakamura H, Seki M, Motoda T. Foot drop of sudden onset caused by acute hematoma in the lumbar ligamentum flavum; a case report and review of the literature. *Spine (Phila,PA)*, 1976, 33, 2008, E573-5.
- [9]. Guigui P, Benoist M, Delecourt C, Delhoume J, Deburge A. Motor deficit in lumbar spinal stenosis: a retrospective study of a series of 50 patients. *J Spinal Disord.* 11, 1998, 283–288.
- [10]. Girardi F P, Cammisa F P Jr, Huang R C, Parvataneni H K, Tsairis P. Improvement of preoperative foot drop after lumbar surgery. *J Spinal Disord Tech.* 15, 2002, 490–494.
- [11]. Postacchini F, Giannicola G, Cinotti G. Recovery of motor deficits after microdiscectomy for lumbar disc herniation. *J Bone Joint Surg Br.* 84, 2002, 1040–1045.
- [12]. Knutsson B. How often do the neurological signs disappear after the operation of a herniated disc? *Acta Orthop Scand.* 32, 1962, 352–356.
- [13]. Masakado Y, Kawakami M, Suzuki K, Abe L, Ota T et al. Clinical neurophysiology in the diagnosis of peroneal nerve palsy. *Keio J Med* 57, 2008, 84-89.10.2302/kjm.57.84, 2008, 18677088
- [14]. Stewart JD Foot drop: where, why and what to do? *Prac Neurol* 8, 2008, 158-169.10.1136/jnnp..149393
- [15]. Voermans NC, Koetsveld AC, Zwartz MJ Segmental overlap: foot drop in S1 radiculopathy. *Acta Neurochir* 148, 2006, 809-813.10.1007/s00701-006-0754-0 16523224
- [16]. Ji JH, Shafi M, Kim WY, Park SH, Cheon JO Compressive neuropathy of the tibial nerve and peroneal nerve by a Baker's cyst: Case report. *Knee* 14, 2007, 249–252.10.1016/j.knee.2007.01.003 17300942
- [17]. Bobba RK, Arsura EL, Sawh AK, Naseem M Diagnostic challenge posed by the clinical presentation of foot drop in a patient with Hodgkin's lymphoma. *Eur J Intern Med* 17, 2006, 572-574.10.1016/j.ejim.2006.07.010 17142177
- [18]. Ferraresi S, Garozzo D, Bianchini E, Gasparotti R Perineurioma of the sciatic nerve: a possible cause of idiopathic foot drop in children: report of 4 cases. *J Neurosurg Pediatr* 6, 2010, 506-510.10.3171/2010.8.PEDS10214 21039177
- [19]. Karaođlan A, Akdemir O, Erdođan H, Colak A. A rare emergency condition in neurosurgery: foot drop due to Paget's disease. *Turk Neurosurg* 19, 2009, 208-210 19431139.

- [20]. Ahmad FU, Pandey P, Sharma BS, Garg A Foot drop after spinal anesthesia in a patient with a low-lying cord. Int J Obstet Anesth 15, 2006, 233–236.10.1016/j.ijoa.2005.11.002 16798451
- [21]. Hans SS, Shepard AD, Reddy P, Rama K, Romano W Iatrogenic arterial injuries of spine and orthopedic operations. J Vasc Surg 53, 2011, 407-413.10.1016/j.jvs.2010.08.084 21055898.

How to cite this article: Nausheen Sajid Khan, Dr.Neha Ingale, and Dr. Sachin Chaudhary, Nikhil Patil. Prevalence of foot drop in lumbar degenerative disease. Int J of Allied Med Sci and Clin Res 2018; 6(2): 232-241.

Source of Support: Nil. **Conflict of Interest:** None declared.