ACTA MEDICA TRANSILVANICA December27(4):49-51
Online ISSN 2285-7079

STUDY ON THE RECOVERY OF MOTOR, POSTURAL, ALGOPARESTHESIA DEFICITS IN PATIENTS OPERATED FOR LUMBAR DISC HERNIATION STAGE III PHASE 3: ADVANTAGES OF EQUISPINE THERAPY

GEORGE SORINEL DIACONU[1], GEORGE POPESCU[2], MIHAI POPESCU[3] GEORGE MIHALACHE[4], RĂZVAN RUSU[5], IOANA CRISTINA NEAGOE[6], LUMINIȚA GEORGESCU[7]

[1,4] Pitesti Emergency County Hospital, [2]Bagdasar Arseni Emergency Hospital, [3,5,7,8] University of Pitesti, [5] University 1 December 1918 Alba Iulia

Keywords: *Equispine, lumbar disc herniation, EPS/SPI motor deficit, body mass index, pain*

Abstract: *Lumbar disc herniation (LDH) is a common spinal condition, with an incidence of 1 new case per 100 inhabitants. A neurosurgery statistic of the Argeș Pitești Emergency County Hospital carried out between 2014 and 2019 shows that a total of 1792 patients were admitted and operated on, 18% of them presenting motor deficits SPE and SPI. Recovery of motor deficits, re-education of the vertebral statics and improvement of residual algoparesthesic syndromes benefit from a multidisciplinary approach involving neurosurgery, neurology, physiotherapy, psychology. The use of Equispine therapy plays a particularly important role in the recovery of patients with lumbar disc herniation.*

INTRODUCTION

Lower back pain is a common global health problem that puts economic strain not only on individuals but also on communities.(1,2) The Global Burden of Disease study published in 2017 conducted for the period 1990-2016 (Global Burden of Diseases) ranks lower back pain among the top five leading causes of disability worldwide.(3) The prevalence of low back pain is thought to be over 84% over an individual's lifetime, and the prevalence of chronic low back pain is about 23%. 11-12% of those affected suffer from disability.(4) Only in the neurosurgery department of the Argeș Emergency County Hospital, Pitesti, statistics show that between 2014 and 2019 a total of 1792 patients were admitted and operated on, of which 18% had sciatic polpliteus externus (SPE) or sciatic popliteus internus (SPI) motor deficits.

Lumbar disc herniation is a common spinal condition and the classic symptomatology is sciatic neuralgia with specific pathway of the affected root, associated with sensory disturbances such as paresthesia and hypo or radicular anaesthesia, changes in osteotendinous reflexes, motor deficits and, in severe cases, sphincter disorders or cauda equina syndrome.(5,6)

In our experience, 1 in 10 patients diagnosed with lumbar spinal disc disease requires surgical treatment. As a technique, the most common surgical intervention involves minimally invasive approach by phenestrectomy with foraminotomy and unilateral extradural discectomy, in more difficult cases hemilaminectomy at 1 or 2 levels or laminectomy. Sciatic polpliteus externus (SPE) or sciatic popliteus internus (SPI) motor deficits as well as re-equilibration of the vertebral statics are treated by classical kinesiology or by revolutionary methods in order to recover muscle tone, mass and strength, both on the anterolateral and posterior lobes of the calf and paravertebral.(7)

AIM

The present study aimed to highlight the effectiveness of including Equispine therapy as a complementary method in a rehabilitation program for the patient with a lumbar disc herniation, operated.

MATERIALS AND METHODS

Equispine therapy is a postural spinal restructuring technique that relieves muscle tone asymmetries that lead to back pain. This method helps to balance the tone of the paravertebral muscles through movement control exercises in particular, and less through strength exercises. Equispine is a very important contribution in achieving the balance of muscle tone in the spine against the backdrop of restoring muscle mass and functionality with the help of therapeutic movement control exercises. Improving movement control by performing exercises with permanent visual performance feedback is immediate and has significant and rapid effects on the recovery process of patients. The information, which the patient has at his disposal with the help of the software, helps the patient to control his movements so that they are as close as possible to the optimal parameters set on the monitor.

Participants:

The group of subjects participating in the research consisted of 40 people, patients operated in the neurosurgery department of the Arges Emergency County Hospital, Pitesti. Among them 19 were men (47.5%) and 21 were women (52.5%), aged between 19 and 42 years, with a mean M = 33.43 and standard deviation S.D. = 5.523. Subjects underwent surgery in 2021. At the time of surgery, they had motor deficit of SPE and SPI, ranging from 2 weeks to 3 months. The motor deficit was medium, which allowed the results to be assessed with the same unit of measurement.

The participants in the study were divided into two

[1]Corresponding author: George Popescu, Aleea Spitalului, Nr. 36, Pitești, România, E-mail: gicadiaconu@gmail.com, Phone: +40723 141512
Article received on 12.09.2022 and accepted for publication on 20.12.2022

research groups, generically referred to as the control group and the experimental group. The control group consisted of 10 women (50%) and 10 men (50%). The age of the subjects ranged from 19 to 42 years, with a mean M=33.50 and standard deviation S.D.=6.295. As for the experimental group, it consisted of 20 subjects, 9 males (45%) and 11 females (55%). The age of the subjects ranged from 23 to 40 years, with a mean M= 33.35 and standard deviation S.D.=4.793.

The experimental group included 16 patients with SPI motor deficit, 3 patients with SPE motor deficit and 1 patient with both SPE and SPI motor deficit.

The control group included 12 patients with SPI motor deficit and 8 patients with SPE motor deficit.

Recovery of patients with the help of physiotherapy started 7-10 days postoperatively, with a frequency of 5 days per week. The initial assessment at the start of the recovery programme was followed by an interim assessment at 3 months and a final assessment at 5 months.

The following parameters were assessed: body mass index (BMI), pain (VAS) and level of disability (Oswestry Disability Index).

Measurement:

The Visual Analogue Scale (VAS) was used to assess current pain intensity. The scale measures subjective pain intensity from 0=no pain to 10=the most intense pain imaginable.

The level of disability was measured using the Oswestry Disability Index (ODI) questionnaire to determine lumbar spine dysfunction due to pain which provides information on how back pain affects the ability to manage daily life.

The questionnaire consists of ten sections, each with 6 possible answers. Statement 1 is marked with 0 points; statement 6 - with 5 points.

A total score of 50 points indicates 100% disability, and a total score of 10 points indicates 20% disability.

RESULTS AND DISCUSSIONS

A comparative examination of the levels of the parameters investigated at the three points of testing shows significant improvements. In this regard, application of the two-way ANOVA-RM test to study the effect of Equispine therapy on the BMI of subjects in the control group and subjects in the experimental group at the three time points of testing showed that the Mauchly test rejected the fulfilment of the sphericity condition $\chi2$ (2) = 48.880, $p < 0.05$, so the Greenhouse-Geisser correction was applied (ε =0.577).

The results indicate that there is a significant effect of the time factor on subjects' BMI F(1,154,43,851)=70.757, $p < .001$, $\eta2$ =0.65, but not of the time * group combination F(1,154,2,315)=3.751, p =0.054, $\eta2$ =0.09. The results also showed the effectiveness of Equispine therapy on the pain perception of subjects in the control group and subjects in the experimental group at the three testing time points. The Mauchly test meets the sphericity condition $\chi2$ (2) = 2.64, $p > 0.05$. The results indicate that there is a significant effect of the time factor on subjects' pain F (2,76) =1147.437, $p < .001$, $\eta2$ =0.96, as well as of the time * group combination F(2,76)=26.477, p =0.000, $\eta2$ =0.41.

At the experimental group level between all three test times there are significant differences (p = 0.000). Also, application of the two-way ANOVA-RM test to study the effect of Equispine therapy on the perception of disability due to pain of subjects in the control group and subjects in the experimental group at the three time points of testing demonstrated that the Mauchly test met the sphericity condition $\chi2$ (2) = 3.751, $p > 0.05$. The results indicate that there is a significant effect of the time factor on subjects' pain disability F(2,76)=9030.387, $p < .001$, $\eta2$ =0.99, as well as the time * group combination F(2,76)=46.185, p =0.000, $\eta2$ =0.54. There are significant differences (p = 0.000) in the experimental groups between all three time points of the test. Post hoc analysis was performed with the Bonferroni test. The results discussed are summarized in table no. 1.

Table no. 1. Means, Standard Deviations, and Two-Way ANOVA Statistics for Study Variables

Variables	EG		CG		df_{Num}	df_{Den}	Epsilon[b]	ANOVA		
	M	SD	M	SD				F	p	η^2_g
IMC										
Time 1	28.63	3.59	27.82	2.95	2	43.85	.577	70.75	.000	.65
Time 2	27.37	2.99	27.01	2.62	1.15	43.85	.577	70.75	.000	.65
Time 3	26.86	2.50	26.73	2.44	1.15	2.31	.577	3.75	.054	.09
VAS										
Time 1	8.85	.87	9.15	.671	2	76	.931	1147.43	.000	.96
Time 2	2.75	1.02	4.85	.813	2	76	.931	26.47	.000	.41
Time 3	1.50	1.10	3.60	.995	2	76	.931	26.47	.000	.41
ODI										
Time 1	40.00	1.80	40.50	2.09	2	76	.912	9030.38	.000	.99
Time 2	11.10	2.22	17.00	1.74	2	76	.912	9030.38	.000	.99
Time 3	1.50	1.10	5.20	1.32	2	76	.912	46.18	.000	.99

Note. N = 40. ANOVA = analysis of variance; EG = experimental group; CG = group; df=degree of freedom for nominator/denominator; η^2_g=generalized eta-squared

CONCLUSIONS

The results of the present study demonstrated that Equispine therapy, a spinal postural restructuring technique that relieves muscle tone asymmetries leading to back pain, is an excellent method in the recovery of patients with lumbar disc herniation. Therapies for spinal conditions always need to be tailored to the individual patient and are geared towards correcting and eliminating mistakes made during the recovery program, as well as highlighting correctly executed movements. In this way, the specialist has every chance of gaining the patient's trust, which is very important in the economics of the therapeutic exercise recovery process. The design and use of rehabilitation programs that will include muscle development exercises, balance development and elements of postural therapies containing exercises for postural muscle control, restoration of physiological spinal curves and breath control, as well as the use of Equispine therapy applied to improve spinal muscle asymmetries responsible for back pain, has resulted in both improved joint mobility and stability and decreased pain, leading to a reduction in medication use. Equispine is a very important contribution to achieving the balance of muscle tone in the spine against the backdrop of restoring muscle mass and thus functionality with the help of therapeutic movement control exercises.

The use of this type of therapy is applied in operated disc herniations, both with and without motor deficit, in non-operated disc herniations, but also in scoliosis, kyphosis, lordosis.

REFERENCES

1. Hoy D, Bain C, Williams G, March L, Brooks P, Blyth F, et al. A systematic review of the global prevalence of low back pain. Arthritis Rheum. 2012;64(6):2028–37. http://dx.doi.org/10.1002/art.34347.
2. Freburger JK, Holmes GM, Agans RP, Jackman AM, Darter JD, Wallace AS, et al. The rising prevalence of chronic low back pain. Arch Intern Med. 2009;169(3):251–8. http://dx.doi.org/10.1001/archinternmed.2008.543.
3. GBD 2016 Disease and Injury Incidence and Prevalence Collaborators. Global, regional, and national incidence, prevalence, and years lived with disability for 328 diseases and injuries for 195 countries, 1990-2016: a systematic analysis for the Global Burden of Disease Study 2016. Lancet. 2017;390(10100):1211–59. http://dx.doi.org/10.1016/S0140-6736(17)32154-2.
4. Airaksinen O, Brox JI, Cedraschi C, Hildebrandt J, Klaber-Moffett J, Kovacs F, et al. Chapter 4 European guidelines for the management of chronic nonspecific low back pain. Eur Spine J. 2006;15(S2):s192–300. http://dx.doi.org/10.1007/s00586-006-1072-1.
5. Schoenfeld AJ, Weiner BK. Treatment of lumbar disc herniation: Evidence-based practice. Int J Gen Med. 2010;3:209–14. http://dx.doi.org/10.2147/ijgm.s12270.
6. Hartvigsen J, Hancock MJ, Kongsted A, Louw Q, Ferreira ML, Genevay S, et al. What low back pain is and why we need to pay attention. Lancet. 2018;391(10137):2356–67. http://dx.doi.org/10.1016/s0140-6736(18)30480-x.
7. Pourahmadi MR, Taghipour M, Ebrahimi Takamjani I, Sanjari MA, Mohseni-Bandpei MA, Keshtkar AA. Motor control exercise for symptomatic lumbar disc herniation: protocol for a systematic review and meta-analysis. BMJ Open. 2016;6(9):e012426. http://dx.doi.org/10.1136/bmjopen-2016-012426.
8. Stoll T, Germann D, Hagmann H. Physiotherapy in lumbar disc herniation. Ther Umsch. 2001;58(8):487–92.http://dx.doi.org/10.1024/0040-5930.58.8.487.