

The effect of a therapeutic program on the degree of cervical herniated disc

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Abstract. The aim of this study was to investigate the impact of the supposed therapeutic program – using massage, therapeutic exercise, and Traction- to decrease the degree of cervical disk herniation. And improve grip's strength, arms strength, and neck flexibility. Also, decrease pain, and muscles temperature. Systematic review with meta-analysis of randomized trials on patients with cervical disc herniation, with an age average = 41.36 years, the height average = 167.72 cm, and the weight average = 67.86 kg. The program was applied over 6 weeks by therapeutic sessions, and it follow-up for two months. Was used the magnetic resonance imaging (MRI) to determine the degree of herniated disc, Dynamometer for muscles strength, Inclinator for flexibility, Electro thermometer for muscles temperature, and VAS for pain. The results showed a statistically significant difference between the two measurements pre- and post to all patients. *Conclusion.* Patients with cervical disc herniation can benefit from the supposed therapeutic program to improve their health.

Key words: *herniated disc, massage, traction therapy, exercises.*

Introduction

The most common between the different parts of the body back area, which suffers from it 96% of people (1). In addition, it is one of the common pain among athletes, where indicates Mujalli 1987 (2) that the popularity among athletes ratio ranging from 84% - 86% due to different training loads, and intensive training and diverse use of instruments and tools from different situations, this would constitute high burdens on the back area, leading to the severe pain (3).

In addition, when these symptoms become chronic, it need surgical interventions to reduce. However, the complications of surgical intervention may lead to the worse (4,5). Although drug treatment has proven effective in some cases, but the long-term use in patients who suffering from back pain has side effects. Therapeutic methods used have varied in the treatment of herniated disc, and designed many of the therapeutic programs, and using a variety of remedies, but the problem of herniated disc and its complications still lingers.

Physical therapy has proven effective than other therapeutic means in treating many cases of disk herniation (6). And that the rehabilitation process and using physical therapy is the first process have to focus on specially using remedial massage, traction therapy, and therapeutic exercises. Where they are used to restore the functional capacity of patients through development of muscle strength and flexibility (6,7).

This study aimed to develop a program of therapeutic exercises, remedial massage, and traction, for patients with cervical herniated disk, and to identify the impact of the program on the variables of the study, which include the degree of herniated disc, the strength of the grip, the strength of the arms muscles, the flexibility of the neck, deltoid and trapezius temperature and pain.

Material and Method

The study sample consisted of 36 patients (females) with cervical herniated disk (41.36 years average, 167.72 cm of length average, and 67.86kg of weight average).

Patients who participated in this study were volunteers. Were informed about study procedures and written informed consents were obtained.

Ethics approval. Written informed consents were obtained by patients.

The researchers designed a therapeutic program of remedial massage, traction therapy, and therapeutic exercises. They applied the program on all patients individually for 6 weeks and by 20 therapeutic sessions, in their homes. Then follow-up exercises for 2 months after, from February 2016 to November 2017.

Table 1. Therapeutic program

No. therapeutic session	Therapeutic means	Target area	Repetition	Duration	Target	Notes
1-10	Acupressure Massage	Neck and shoulders The muscles of the neck and shoulders	5/R*5/s -	/ 10m / 20m	Provide muscle relaxation and increase the endorphins, relieve pain	-
6-10	Stretching exercises	The muscles of the neck and shoulders, back and arms	10/R*3	10-15m	Increased softness of muscles, relieve pain	The stretching exercises after the message
11-20	Traction therapy	The neck	-		Increase the distance between the vertebrae and relieve pressure on the nerve roots.	Put collar neck immediately after traction for 30m
20	Therapeutic Exercises	The muscles of the neck and shoulders, back and arms	10/R*3	-	Improve muscle strength	Follow-up exercises for 2 months

R = repetition; s = second; m = minutes

Outcome measures. The researchers used MRI to determine the degree of herniated disc, dynamometer for muscles strength, inclinometer for flexibility, electro-thermometer for muscles temperature, and Visual Analog Scale (VAS) for pain.

Data analysis. The statistical program SPSS was used to find out frequencies and percentages.

Table 2. Traction therapy program

No. Session	User / kg weight	Duration / min
1	2	5
2	2	5
3	2	6
4	3	8
5	3	10
6	3	10
7	4	10
8	4	12
9	4	15
10	4	15

Results

- The table (3) shows that the value of T-test calculated between the pre- and post-measurements of the disk herniation degree was 8.99 (level of significance 0.000), 34.03 for the degree of the pain (level of significance 0.000), the value of T-test calculated between the averages of pre- and post- measurements of the right grip's strength was 16.78 (level of significance 0.000), 12.01 for the left grip's strength (level of significance 0.000) and 6.73 for the arms strength (level significant 0.000).
- Also, the value of T-test calculated between pre- and post-measurements of the head rotation to the right has reached 13.81 (level of significance 0.000), 11.37 for the head rotation to the left was (level of significance 0.000), right bending (head) was 13.44 (level of significance 0.000), left bending (head) was 18.77 (level of significance 0.000), forward bending (head) was 11.35 (level of significance 0.000) and backward bending (head) 11.53 (level of significance 0.000).
- The right deltoid temperature was 20.45 (level of significance 0.000), the left deltoid temperature was 22.01 (level of significance 0.000), amounted of the right trapezius temperature was 22.74 (level of significance 0.000) and 9.08 for the left trapezius temperature (level of significance 0.000).
- These results indicate the presence of significant differences between the averages of two measurements pre- and post- for all the variables of the study and in favor of telemetry because the level of the whole significance of the values were less than 0.05.

Table 3. T test results t between the pre and post-measurements for the variables of the study

Variable	Unit	Measurement	SMA	standard deviation	t	The level of significance
The degree of disk herniation	0-10	pre	3.47	0.94	8.99	*0.000
		post	2.53	1.00		
Pain	0-10	pre	6.56	1.16	34.03	*0.000
		post	0.50	0.61		
Right grip's strength	Kg	pre	18.30	2.60	16.78	*0.000
		post	24.78	3.40		
Left grip's strength	Kg	pre	18.30	2.60	12.01	*0.000
		post	22.64	3.38		
Arms strength	Kg	pre	36.64	5.79	6.73	*0.000
		post	42.29	4.66		
Head rotation to the right	Degree(°)	pre	66.06	6.92	13.81	*0.000
		post	80.44	2.50		
Head rotation to the left	Degree(°)	pre	67.08	8.85	11.37	*0.000
		post	80.97	2.57		
Right Bending (head)	Degree(°)	pre	36.56	3.59	13.44	*0.000
		post	43.83	3.51		
Left Bending (head)	Degree(°)	pre	37.25	3.46	18.77	*0.000
		post	44.11	3.16		
Forward Bending (head)	Degree(°)	pre	37.56	4.67	11.35	*0.000
		post	44.06	5.00		
Backward Bending (head)	Degree(°)	pre	37.94	5.60	11.53	*0.000
		post	44.28	6.93		
Right deltoid temperature	Degrees Celsius	pre	29.94	1.35	20.45	*0.000
		post	33.83	0.88		
Left deltoid temperature	Degrees Celsius	pre	30.19	1.06	22.01	*0.000
		post	34.00	0.89		
Right trapezius temperature	Degrees Celsius	pre	30.28	1.00	22.74	*0.000
		post	33.72	0.81		
Left trapezius temperature	Degrees	pre	30.20	1.23	9.08	*0.000

Celsius	post	33.34	1.73
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Discussions

The researchers believe that patients with cervical disk herniation have pain, due to the pressure of the herniated disk on the nerve roots, and the incidence of muscle spasms, lack of use of the affected side. Which leads to a lack of blood and nerve supply to the muscle that fed by.

Applying therapeutic program with all its means (especially remedial massage), led to relax the muscles, and increase the endorphins which helps to relax the muscles, as well as to increase the activity of the circulatory and metabolic processes and thus raise the it's temperature. Therefore, increase elastic of muscles, tendons and ligaments, so improve flexibility.

Also, the use of traction therapy helps to extend the distance between the vertebrae and relieve pressure on the nerve roots, allowing blood supply and neurological the muscles fed by. Therefore, allowing to stimulate the greatest number of muscle fibers, so produce more power, as well as muscles relaxation makes them work on extraversion and full contraction and therefore produce a much larger force.

The low degree of pain helps to raise the patient's ability to produce more power. This is consistent with the study of each of Mohsen (6), Bani Hani (7) and Lucy (8) and who indicated that the use of therapeutic massage and thermal means and exercises stretching muscle helped unpack muscle spasms and increase the suppleness of muscles and relieve pain, which led to improved muscle strength they have.

In addition to the use of traction is working to expand the distance between the vertebrae and relieve pressure on the nerve roots, which provides an opportunity for herniated disk and its components to return to its natural place at least partially, and this is consistent with what he referred to Oztuk, et al. (9), who stressed on the importance of using traction therapy to return the herniated disk, also both Khabirov (10) and Epifanov (11), to treat the muscle spasms that relieves pressure on the disk, therefore, helps it return it.

The researchers also believe that each of the methods used in the study have implications on the pain scores in patients, as the improved softness muscles leads to pain relief that is often caused by muscle sources in patients with disk herniation. Also, the use of remedial massage leads to increase the endorphins, a hormone which is naturally decrease the pain.

Conclusions

The proposed therapeutic program, consisting of remedial massage, traction therapy, and therapeutic exercises, helps to decrease the degree of herniated disk, improve the strength of the grip and the strength of the muscles of the arms, improving the flexibility of the neck, and decrease pain.

The researchers recommended to use the therapeutic program for patients with cervical disk herniation. And to use more than a therapeutic method for them.

Physiotherapy has positive effects on patients with cervical disk herniation. There are inconsistencies in the results of several studies conducted in the field of herniated disk treatment, whether using physical therapy, surgeries or drugs. Where results indicated of Sevansson study, et al. (12) to use a physical therapy for these cases is better than surgeries, while the results indicated of Tarananen study, et al. (13) to a preference for surgical intervention to decrease the degree of pain of lumbar herniated disk by 65% and raise the degree of disability by 47%. Some studies results showed that the use of electro-therapy is optimal in the herniated disc treatment, as a study of Aziz & Basem (14). In addition, some studies showed that using of therapeutic exercises and massage better than to use as a study of Mujalli (15), at the same time, some studies have pointed to the need for the use of traction therapy as an effective means to decrease the degree of herniated disk. While some studies have pointed to the lack of effectiveness of the use of physical therapy in

reducing the degree of herniated disk, as shown in a study Kamanli, et al. (16). From the above, we find that there is no specific therapeutic method that decrease the degree of herniated disc and pain.

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Competing interests. The authors declare that there is no conflict of interest.

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