Advances in Bioresearch
Adv. Biores., Vol 6 (6) November 2015: 112-119
©2015 Society of Education, India
Print ISSN 0976-4585; Online ISSN 2277-1573
Journal's URL:http://www.soeagra.com/abr.html
CODEN: ABRDC3
ICV 7.20 [Poland]

Advances in Bioresearch

ORIGINAL ARTICLE

Comparison of Evminov's Tensile and Strength Exercises with Physiotherapy and Acupuncture Therapy Methods towards Pain Drop and Improvement of Walking Ability in Tight Myeloid Channel Patients

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ABSTRACT
One of the factors of LBP is a tight myeloid channel. This closure happens when the bones and the other tissues are grew and penetrated to this channel, and this growing of the additional tissues is part of the ageing process. The Evminov method is a new sportive solution, with lack of current sportive treatment, which includes acupuncture and physiotherapy in order to kill the pain and more activity in tight myeloid channel patients. The statistic population consists of tight myeloid channel patients who visited physical and rehabilitation clinics of Baghiyatalah Hospital between 2010 to 2011years.Answering the fundamental questions about the investigated case; we begin to data gathering by taking the advantage of question sheet. Then, in order to assess the data, the descriptive statistic test (average, standard deviation and standard error) and analytic statistic are applied.
Key words: myeloid channel, LBP, Spinal column, supporting and tensile sport

Received 02/08/2015 Accepted 24/10/2015

How to cite this article:
Asadolah A, Mehdi G H, Mohamad T H. Comparison of Evminov's Tensile and Strength Exercises with Physiotherapy and Acupuncture Therapy Methods towards Pain Drop and Improvement of Walking Ability in Tight Myeloid Channel Patients. Adv. Biores., Vol 6 [6] November 2015: 112-119**.** DOI: 10.15515/abr.0976-4585.6.6.112119

INTRODUCTION

During the last 6 months, 40% of people have suffered from the bottom waist pain and 84% of people are afflicted through their lifetime by this pain. 1) The waist pain or LBP cause lots of trouble in routine activities or work proximately for 7 days. 2) The number of feeble patients and the costs of LBP have had an invasive rate through the last 30 years caused by the social and occupational changes of LBP. Therefore, LBP can impose bearable economic expenses on society and decrease productivity.

One of the LBP's factors is tight myeloid channel caused inherently, evolutionally and acquisitively. The symptoms of tight myeloid channel are resulted from a series of complex conversions in the inner spinal column of waist. Destructive conversions of the spinal column are in tie with ageing process, which triggered some mechanical pressure on the spinal or spinal root [4].

Doing exercises shows good results in therapy of chronic LBP; it increases strength and muscle tolerance to provide a better support for spinal column and improvement in waist flexibility which consequents in less pain and enhancement of patients' standing mode. Exercising and sport have positive impressions on person's thoughts and attitudes toward the pain, in spite of physiologic benefits, also, it reduce the anxiety and phobia of being active in patients [5].

The Waist exercises reinforce waist enduring and central muscles that play a critical role in supporting spinal column and they got proprioception modification [6]. These kinds of exercises enhance and stretch muscles and help to control muscles. Abdominal muscles exercises are suitable for patients, who tolerate

so many pains or begin the primary stages of rehabilitation, and patients that cannot put many forces on their spinal column [7].

METHODOLOGY

The current statistic population consists of tight myeloid channel patients which visited the physical therapy and rehab center Baghiyatalah Hospital during 2010 to 2011. In this research α value (stance for first type error) considered 50 % (reliance rate 95%) and β value considered (stance for second type error) maximum 20% (power 80%). Since, the variable are supposed to be compared in three various groups; sport, physiotherapy and acupuncture, firstly, we compare the sample value between the two groups of sport and physiotherapy by considering the previous similar studies. By this concept*

$n= ((Z1-\alpha/2+Z1-\beta)^2(\delta1^2+\delta2^2))/((\mu1-\mu2)^2)= ((1.96+1.28)^2(2^2+1.5^2))/((6-5)^2)=65$

Since all three groups are compared simultaneously, the total sample's volume estimated through below formula:

$N= n\sqrt{K}$ = total sample's volume

K= numbers of the goups-1 N=90

To compile the demographic information of the patients, a questionnaire was applied included: age, sex, height, weight, the involved area, duration of involving and the clinical information of patients was extracted upon MRI, EDX, Lab Test, X-Ray, BMD, history, checkup, pain degree(based on VAS measure) and distance created by neural sway (due to the meter). The findings were registered in every three groups of patients at the beginning, ending and 4 weeks after the therapy.

After fulfillment of the mentioned stages above, questionnaires got marked and the results and information registered for each group immediately after ending of therapy period and 4 weeks after ending the therapy, and entered to the IBM SPSS 21 software, then the descriptive (average, standard deviation and standard error of the mean) and analytical statistic test were applied. To verify the normality of sample's distribution, the K-S test was applied, and in case of samples normality, the Paired-T-Test and ANOVA along the Tukey test was used. In case of abnormality of the sample, non-parametric tests like Wilcoxon, Mann Whitney and Friedman test was applied long the tukey test.

According to the statistical estimations, we needed proximately 90 patients. Considering the possibility of some patients' withdrawal throughout the study, we took 120 patients at the beginning; consequently 92 patients remained in the research. The remarked patients divided into three groups contains of 30 people randomly as below:

It should be noted that, this classification carried upon the similar previous researches at the same field (66 and 69).

First group: Evminov exercises

Second group: physiotherapy

Third group: acupuncture

RESULTS AND DISCUSSION

Comparing the mean-difference of the patients' pain among the groups of therapy, VAS measurement at the beginning of therapy

The average pain of patients upon the VAS value at the beginning of therapy included 8.63+ 0.76 in sport group, 8.35+ 0.89 in physiotherapy group and 8.74+1.1 in acupuncture group. The average difference of pain among the therapy groups at the beginning was not meaningful due the Tukey test.

In Small group of patients, the LBP gets chronic. Half of the sick leave was used to LBP. 15 % of sick leave due LBP takes longer than one month. Approximately, 80 to 90 % of healthcare and social expenses allocated to LBP; consumed by 10% of LBP patients which is chronic, more than 1% of American get disabled due chronic LBP and the rest of them (1%) are incapacitated temporary (2).

Average difference of patients' pain among therapy groups through the VAD value, at the ending of therapy

Average difference of patients' pain at the ending of therapy included 5.69=1.50 for sport group, 6.68+1.51 for physiotherapy group and 7.96+1.26 for acupuncture group.

Average difference of pain was meaningful statistically due the Tukey HSD test among the following groups: between the sport and physiotherapy, between the sport and acupuncture, between the physiotherapy and acupuncture. It could be implied that the pain average of patients upon the VAS value at the ending of therapy was lower in sport group compare to the physiotherapy and acupuncture groups, and even lower in physiotherapy compare to acupuncture group. It could be inferred that the effect of doing exercises at the ending of therapy was more excessive than physiotherapy and acupuncture methods and consequently, physiotherapy was more than acupuncture.

Comparing the average difference of patients' pain among therapy groups upon VAS value one month later the therapy ending

The average difference of patients' pain upon the VAS value one month later the therapy ending included 4.25+2.38 in sport group, 6.44+1.60 in physiotherapy group and 8.24+.14 in acupuncture group.

Small amount of people catch chronic LBP and become feeble. Above half of the sick leaves are used for LBP.Nearly15% of sick leaves that used for LBP take longer than one month.80-90% of allocated health and social expenses of LBP consumes for 10 % of chronic LBP patients with severe incapability. More than 1% of USA population becomes incapable proceeding by chronic LBP and the rest 1precent get temporary incapable [2].

The tight myeloid channel is inborn in some people. Such condition is more common in men and the symptoms are seen between 30 to 50 ages; large number of them has not any symptoms until the other triggers force on spinal and extremely tightens it. Mechanical force on nerve does not lead to neural wobble because in this case the patient's problems are solved by taking surgery, though it is not in that way [14].

The tight myeloid channel closure occurs when the bones and the other tissues are grew and penetrated to this channel, and this growing of the additional tissues is part of the ageing process. In fact, this disease reveals at elders with 50-60 ages. The exposure of it is same in men and women but the signs are more visible in women, which needs extra treatments.

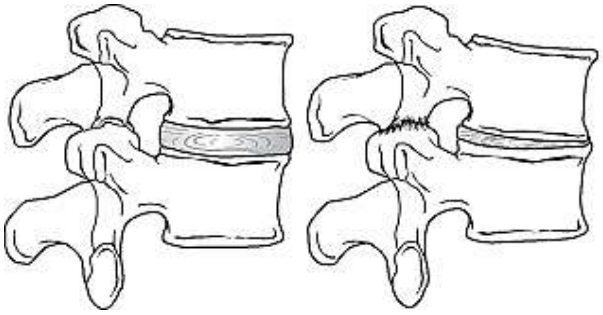

Figure (1-1) - A youth person's disk which contains surplus water and extra height (the right figure), and an elder person's disk with lower water and height (the left figure).

This disease initiates by ageing of the vertebral disk. Through ageing process the vertebral disk, get dehydrated, wrinkled and minimized. Height reduction of disk closes the vertebras to each other that lead into two major problems:

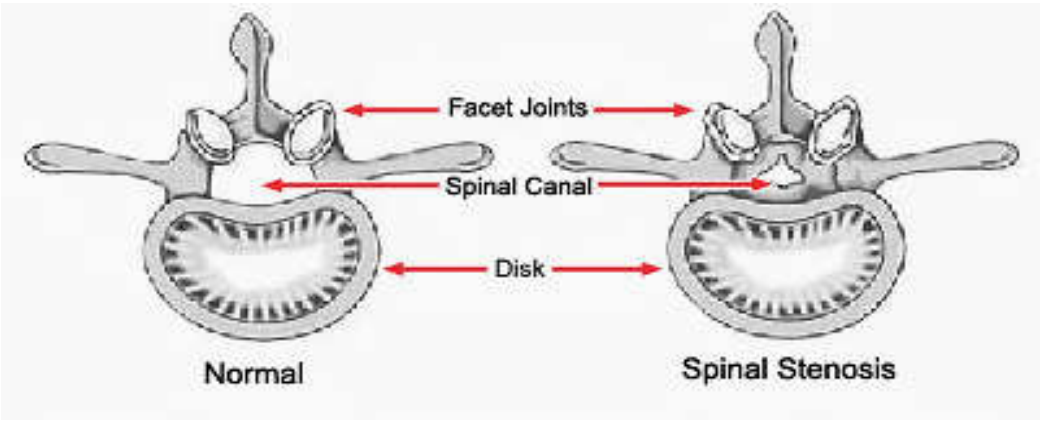

Figure (1-2) - A normal disk (the right picture) and a disk with degenerative*modifications (the left picture).

1- The entrance that located in middle and both sides of two adjacent vertebras gets tight. These entrances provide a kind of exit way for spinal's neural roots and puts lots of force on it.
2- Closed vertebras create extra pressure on the interval joints, which causes joint's arthritis and abrasion. Each abrasion joints begin to generate extra bones around it. In addition, the above ligaments of joint get thicker [11].

Spinal column anatomy

Spinal muscles carried out two major functionalities instantaneously: first, to keep the position and posture, second, controlling intersegment communications.

A segment includes, upper and down disk's vertebra, muscles and areal ligaments. Segmental Dysfunction occurs when a segment moves a lot or gets solid and dried that leads into low movement, for reasons such as arthritic or ligament's modification. Aggregated segmental movement (segmental instability) are created by tissues' destruction (ligament disorders, strain), decreasing of muscles endurances and muscles controlling disorders. In addition, the broken Endplate and disk height reduction leads into instability. Normally only 10% of maximum muscles strains are needs for spinal column strength, while in segmental dysfunction muscle movement extended for that mean. The potential power of these muscles involved in accidental conditions likes falling, sudden pressures on vertebra and aggressive movements [15].

Waist composes of five vertebras. Waist's vertebras made of three parts:

1- Body , 2- neural curve, 3- dorsal elements

Aligned the length of the waist spinal column (from up to bottom) the size of vertebras getting larger gradually. The front part of the vertebra is bigger than the backside at three ending waist's vertebras and created a bending shape position in the vertebras proceeding into lordosis condition at the waist area. The dorsal elements placed at the backside of vertebra's body including lamina, facets joints and Spinous process. These elements linked to the vertebra's body by means of two thick legs called Pedicle. Pedicels create tolerance against bending and dispense the imposed forces throughout the dorsal elements and vertebra. Parsinterarticularisis part the lamia placed between the upside and bottom joint which exposed to the generated bending forces and made the Spondylolisthesis [23].

Signs and symptoms of tight myeloid channel

1- Reduction of waist pains in sitting or bending forward positions:

Pains reduced on such conditions because the inter-vertebra space becomes wider and the stress drop of the nerves, therefore the patient's symptoms lowered on those conditions.

2- Muscles weakness:

When the nerve gets under the stress, movement functionality of it damaged and the linked muscles of so-called nerve undermined, so, the person feels disability and graveness on both lower organs. The patients might lose the power to raise their feet wrist and sliding it on the ground.

3- Numbness of one or both foots, bottom or shanks

4- Numbness, burning sensation, feel pins and needles or scratching of the foots, bottom or shanks:

This burning sensation created by the imposed stress on the neural roots. When the running nerves from spinal to the lower organs tangled, pain is received on the area that the nerve must end in it. For example, if the nerve which goes to backside of the shank twisted, the pain received by shank's backside.

5- Muscles strain

6- Immediate Fatigue:

Fatigue and wobbling on foots (neural wobbling): the difference of neural wobbling from the blood vessels deficiencies is that: standing and stopping are much enough to take the pains away in the blood vessel wobbling, but in the spinal case the patients have to bend themselves forward or squat to get settled [13].

Having this in mind, that pain killing is not the main aim of the treatment of these patients. Feeling pains is an important alerting system in body's physiology and implied the background problem. Therefore, pain killing without settling the main problem can be catastrophic in long term which, will resulted in conceal advancement of background disease. Much of the tight myeloid channel patients are treatable by means of non-surgery methods particularly if they recognized immediately. Although these methods do not provide enough space for the nerve, many patients feel more comfortable with the treatments. However, in the extreme and twisted condition the need for surgery is increased. Therefore, postponing of visiting the doctor and improper diagnosis of disease can have bad consequences for the patient [22].

Comparing the average difference of Severity of the Neurogenic in sport group due to ranking method of ODI walking at the ending of therapy toward the beginning of therapy, one month later the therapy ending toward the ending of therapy, and one month later the ending of therapy toward the beginning of therapy

Average difference of Severity of the Neurogenic due paired samples test was meaningful in sport group at the ending of therapy toward the beginning, one month later the ending of therapy, and one month later than the ending of the therapy toward the beginning of therapy. It could be implied that doing exercises minimize the pain's rate in Neurogenic patients at the ending of therapy and one month later the beginning of therapy compare to the beginning of the therapy. This reduction in pain was more significant than acupuncture and physiotherapy.

No drug consuming treatment of LBP:

Sport: the chronic LBP patients may catch Para-spinal muscles atrophy, especially multifidus. Having disorders in resisting power of the strength muscles of spinal columns and abdominal diaphragm muscles, particularly the horizontal abdominal muscles is a vulnerable factor to damage the spinal column.

In exercising, person needs to breathe fast and deeply and this proceeds to areal tension in abdominal muscles. Supporting of the vertebras made by these muscles in People with strong back muscles, however, persons with the weak muscles may have instability and damages that resulted in taking pains. So doing the suitable exercises and creating a balance between the agonist and anti-agonist muscles should be concerned specifically in patients with the spinal channel diseases such as tight myeloid channel.

If Exercising fulfilled in proper position and alignment, which joint is in its best functionality and movement mode, will have more excessive and positive effects [15].

Exercise programs have positive mental influences, in spite of physical effects on the patients. For example, doing exercise can build up a positive vision in chronic LBP patients who were avoided physical activities because of scaring to make their conditions awful or centralization of their chronic pain, and minimize the such behavior , and finally remove the decondition mood and incapability on them [16]. Exercising protocol of the tight myeloid channel includes bending forward movements [17]. The aim of that exercises is for creating stable condition in spinal column and contains of waist muscles enhancement, Pelvic girdle, abdomen and stretching particularly Sartorius muscle and hi- likes muscles such as iliopsoas, rectus and femoris [14].

Comparing the average difference of Severity of the Neurogenic in physiotherapy group due ranking method of ODI walking at the ending of therapy toward the beginning of therapy, one month later the therapy ending toward the ending of therapy, and one month later the ending of therapy toward the beginning of therapy.

Average difference of Severity of the Neurogenic due paired samples test was meaningful in physiotherapy group at the ending of therapy toward the beginning, one month later the ending of therapy, and one month later than the ending of the therapy toward the beginning of therapy. It could be implied that physiotherapy minimize the pain's rate in neural sway patients at the ending of therapy compare to the beginning of therapy and one month later the ending of therapy. This reduction in pain was less than sport but more than the acupuncture. The effect of physiotherapy in reduction of Severity of the Neurogenic was much lower in one month later the therapy compare to the ending of therapy. This reduction in pain was much lower compare to the sport and physiotherapy.

Physiotherapy

Physical modalities:

Modalities are the equipment and physical methods which applied in the flesh response therapy, including: thermo, coldness, voice, electricity and electromagnetic waves (infrared light, visible light, UV, short waves and microwave). Thermo therapy is applied in muscular/neural conditions which provide relaxation and analgesic effects to remove the inflammation.

Increasing of elasticity and reduction of the joint rigidness brings forward the thermo as a useful modality in constructors and arthritis (17).

Comparing the average difference of Severity of the Neurogenic in acupuncture group due ranking method of ODI walking at the ending of therapy toward the beginning of therapy, one month later the therapy ending toward the ending of therapy, and one month later the ending of therapy toward the beginning of therapy

Average difference of Severity of the Neurogenic due paired samples test was meaningful in acupuncture group at the ending of therapy compare to the beginning, but it was not meaningful in one month later the ending of therapy compare to the ending of therapy. It could be inferred that acupuncture minimize the pain in Neurogenic patients at the ending of therapy compare to the beginning of therapy, and in one month later the ending of therapy compare to the beginning of therapy, but the effect of it was getting less over month later the beginning of therapy compare to the beginning of therapy. This pain drop was more significant than sport and physiotherapy groups.

Acupuncture

Acupuncture influenced the LBP in various ways:

1- Affecting the inneropioid system of the body
2- Affecting the sympathetic neural system
3- Adjusting the pain processing system on brain and spinal.

When acupuncture compared with the other LBP standard methods, analyzing of the result gets difficult, because the placebo effect in the aggressive methods like acupuncture is excessive. Acupuncture is a non-dangerous method and got low side effects (18).

Vast researches carried out by McGILL above assessing the imposed forces on spinal column while doing the exercising methods on LBP patient, resulted in:

While doing exercises in the Sit-Up mode, a force around 3000_N enforces on spinal column. This is a power for lifting average weight stuffs. This enforcement reduced in Curl-up position.

Exercising in prone position along the extension of spinal column, and lower and top organs (such as Mckenzie method) imposes a power around 3000-6000 $_n$ on the spinal column. The possibility of damages gets doubled on the spinal column in such position [16].

The major difference of exercising with the Evminov method from the other sportive solutions, are in doing exercises simultaneously with the elastic force on spinal column and elevation of the major weight of body and the top organs from the waist spinal column, which leads into having a painless or relaxation condition on patient's spinal column. This condition is created by laying the patient on Evminov board which made a proximate 45^0angel between patient and the surface and the tensile force on the spinal column by the weight of the patient. The painkilling mechanism in lay down position on the Evminov board includes having the maximum pressure on the spinal column, creation of minimum interval between the vertebras and diameter of the vertebras' holes, having minimum stress on the spinal and theneural roots. Having this numbness mood increase the tolerance of patient for doing the exercise programs. Reduction of stress on the disk and the neighbors structures such as ligaments and etc., and adjusting them in an anatomic manner facilitate the disk nutrition by releasing materials to the disk especially innucleus palpus. By that mean the spinal column functionalities are revived and the pathologic procedures prevented [19, 20]. The tight myeloid channel is commonly treatable by means of sport-therapy, physiotherapy and hydrotherapy, and the program, which is prescribed by the physiotherapy expert.

Backside reinforcing exercises: it contains the exercises that strengthenmusclesfirmness and power, tendons and ligaments, back, stomach, hips and organs, which reduced the damages possibilities on the spinal columns, maintaining the natural direction of it and facilitating its movements and finally leads into pain drops [21].

Back side stretching exercises: they are kinds of the exercises applied for increasing the tensile and mobility of the soft tissue around the spinal column (muscles, tendons and ligaments) and its neighboring areas (back, stomach, hipbone, hip and the organs) which upsurge the flexibility and mobility of the spinal column [21].

This new treating method is compared with the common method like as physiotherapy and acupuncture; as its inventors quoted that it is more easer, cost effective and significant for the tight myeloid channel patients. If in the current survey the relative superior of this treatment method is proven over the physiotherapy and acupuncture, the patients will take the following advantages:

1- This sportive method can be done easily at home by the patients with the minimum side effects and no needs to expensive sport equipment, especial sport court or the large area and consequently it would not impose huge expenses to the patient and the health system.
2- This method minimize the needs for visiting the physiotherapy centers in the patients urged to pay frequent visit and dedicate time and cost, and sometimes in patients who has limitations in using some modalities.
3- This method minimizes the needs for visiting the acupuncture centers in the patients, which in addition of spending cost and time needed to pass the attacking procedures (usually along with pain, stress and sometimes infections or disease transition).
4- This method underrates needs of the patients to drugs or attacking procedure like as inner-spinal injections or surgeries, which may impose many side effects and costs expenses to the patient's health system.
5- The prevailing possibilities in public and massive scale such as sport complexes, parks, schools etc are existed, also among the patients and even healthy people as a preventive method for the spinal column deformities.

Comparing the average and rate of pain modifications, Distance Claudication and Severity of the Neurogenic among therapy groups

*Applying this test due normal distribution of variables throughout therapy groups in K-S Kolmogorov-Smirnov Test ($p \leq .05$). * Meaningfulness in which $p \leq .05$ .Severity of pain at the beginning of therapy upon the VAS scale. *Severity of pain at the ending of therapy upon the VAS scale. *Severity of pain one month later the beginning of therapy upon the VAS scale.* The Claudication distance of patient at the beginning

of therapy upon Meter.* The Claudication distance of patient at the ending of therapy upon Meter.* The Claudication distance of patient one month later the therapy upon Meter. *Severity of the Neurogenic in patient at the beginning of therapy upon the measure of Oswestry Disability Index walking item score.* Severity of the Neurogenic in patient at the ending of therapy upon the measure of Oswestry Disability Index walking item score.* Severity of the Neurogenic in patient one month later the beginning therapy upon the measure of Oswestry Disability Index walking item score.

	Therapy group			**Post Hot Tests**	**Post Hot Tests**	**Post Hot Tests**
	sport	Physiotherapy	acupuncture	Tukey HSD*	Tukey HSD*	Tukey HSD*
	Average and standard deviation	Average and standard deviation	Average and standard deviation	Sport toward physiotherapy	Sport toward acupuncture	Physiotherapy toward acupuncture
VAS*0º	8.63±.76	8.35±.89	8.74±1.10	0.491	0.868	0.238
ººVAS1	5.69±1.50	6.68±1.51	7.96±1.26	0.018*	0.000*	0.002*
VAS2ººº	4.25±2.38	6.44±1.60	8.24±1.14	0.000*	0.000*	0.001*
Rate of change amongVAS0and VAS1	34.06	20.00	8.92			
Rate of change among VAS and VAS2	25.31	3.59	-3.40			
Rate of change among VAS0 and و VAS2	50.75	22.90	5.72			
D.Cª0ˣ	362±405	451±491	434±445	0.769	0.864	0.989
ˣˣD.C1	797±664	694±619	526±568	0.709	0.186	0.547
D.C2ˣˣˣ	1186±677	853±645	624±598	0.103	0.004*	0.355
Rate of change amongD.C0 D.C1	54.58	35.01	17.49			
Rate of change amongD.C1 D.C2	32.80	18.64	15.71			
Rate of change amongD.C0 D.C2	69.48	47.13	30.45			
S. N.C̃ⁿ0ˬ	2.97±.87	2.71±.91	2.85±.82	0.550	0.933	0.792
S. N.C1ˬˬ	2.23±.92	2.32±.77	2.59±.80	0.824	0.182	0.424
ˬˬˬS. N.C2	1.43±.97	2.12±.81	2.33±.88	0.008*	0.001*	0.613
Rate of change amongS.N.C0 andS.N.C1	24.92	14.39	9.12			
Rate of change amongS.N.C1and S.N.C2	35.87	8.62	10.04			
Rate of change amongS.N.C0and S.N.C2	51.85	21.77	18.25			

CONCLUSION

According to the presented discussions and assumptions, the studied exercising method in this survey (the Evminov); applied to decrease the waist pain and increasing the tolerance of walking in the tight myeloid channel patients, was superior significantly over the physiotherapy and acupuncture methods at the end of the treatment and one month later than the therapy.

The advantages of this method over the other studied solutions as following:

1- This method counted as riskless, cost effective, easy and effective with the minimum side effects modality for the tight myeloid channel patients.
2- There are no needs of having expensive sport equipment or especial exercising court and large environment in this method.
3- This method minimize the needs for visiting the physiotherapy and acupuncture centers or the needs to pass attacking procedures like as surgery, inner-spinal injection or prescribing of various drugs which urged the patients to spend lots of cost and time.
4- This method can be applied immensely at homes, publics, sport complexes, schools, universities, offices etc as an exercising mean both for preventing and therapy in the muscular-skeleton problems, which improve the public health and life quality and optimize the health, treatment and rehabs expenses [8,19,20].

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