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THE USE OF KINESIOLOGY TAPING AMONG PEOPLE AGED BETWEEN 25 AND 55 WITH THE NON-SPECIFIC PAIN OF SPINE IN ITS LUMBAR AND SACRAL PART

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SUMMARY.

INTRODUCTION. The phenomenon of the pain ailments of spine is very complex and increasingly common. The key aspect of the treatment is the appropriate choice of the therapy, which may be dependent on many factors i.e.: the cause of the ailments, the phase of the disease, the clinical sypmtoms, the general health condition of the patient, the functional disorders and the patient's abbilities.

AIM OF THE RESEARCH. The aim of the research is the assessment and the comparison of the effects of two methods of the treatment: 1) the therapy based on general exercises focused on the lumbosacral spine combined with Kinesiology Taping and 2) the therapy based

on general exercises focused on the pain intensisty and on the life quality of people with chronic, non-specific pain of the lumbosacral spine among patients aged 25-55.

MATERIALS AND METHODOLOGY. The research was conducted in a group of 50 people with chronic spine pain in the lumbosacral area. They were randomly divided into two groups: 1) the study group, where the ligament application of Kinesiology Taping was used for seven days (KT+GE), 2) the control group: no appliation of Kinesiology Taping (GE). Both groups took general exercises commonly used in the treatment of non-specific pain ailments of the lumbosacral spine for seven days. Durring the assessment of the effectiveness of the therapy the NRS scale (Numerical Rating Scale)and the Oswestry Low Back Pain Disability Scale questionnaire were used.

RESULTS. At the end of the treatment in the KT+GE group the decrease of the average pain intensity was observed from 6,20 to 2,12 (median 6,00 vs 2,00). The decrease of the average pain intensity was also noted in the GE group from 6,20 to 3,48 (median 6,00 vs 4,00). The statistical analysis showed that both forms of the therapy had a statistically significant impact ($p<0,05$) on the decline of the pain intensity in the NRS scale among the patients with the pain ailments of the spine in the lumbar and sacral area. In the KT+GE group after the therapy the decrease was observed: the average from 19,20 to 8,12 and median from 17,00 to 8,00. In the GE group the decrease was also noted: the average from 20,28 to 10,80 and median from 19,00 to 10,00. The statistical analysis showed that both forms of the therapy had a beneficial and statistically significant -$p<0,05$ impact on the ODI sum variable among the patients with the pain in the lumbosacral part.

CONCLUSIONS. 1. Both forms of the therapy influenced statistically significantly on the decrease of the pain intensity in the NRS scale among the patients with the pain ailments in the lumbosacral spine. However, the therapy during which the Kinesiology Taping was implemented was statistically significantly more effective. 2. Both forms of the therapy influenced statistically significantly on the improvement of the quality of life among the patients suffering from the lumbosacral pain. However, the therapy during which the Kinesiology Taping was implemented was statistically significantly more effective.

KEY WORDS: kinesiology taping, the spine pain ailments

INTRODUCTION.

The phenomenon of the pain ailments of the spine is very complex and increasingly common. The key aspect of the treatment is the appropriate choice of the therapy, which may

be dependent on many factors i.e.: the cause of the ailments, the phase of the disease, the clinical sypmtoms, the general health condition of the patient, the functional disorders and the patient's abbilities. The treatment of the pain ailments of the spine is primarily aimed at stopping or relieving the pain, achieving the best possible stabilization, strenghtening trunk and pelvic gridle's muscles, relieving the structures of the spine, adopting the correct body posture and movement stereotypes as well as educating the patient. It is also important to enable the patient to return to his full activity in the social and the professional spheres [1,2,3]. In the therapy of the pain ailments of the lumbosacral spine various methods are used, such as: the pharmacotherapy [4,5], the kinesitherapy [6,7,8,], the manual therapy [9,10], the healing massage [11,12], the physiotherapy [13,14,15,16] and the patient's education [4]. Kinesiology Taping is gainig great interest and popularity in the therapy of low back pain [17,18].

The aim of the research.

The aim of the research is the assessment and the comparison of the effects of two methods of the treatment: 1) the therapy based on general exercises focused on the lumbosacral spine combined with Kinesiology Taping and 2) the therapy based only on general exercises focused on the pain intensisty and on the life quality of people with chronic non-specific pain of the lumbosacral spine among patients aged 25-55.

Material s and methodology.

The research was conducted in a group of 50 people with the chronic pain of the lumbosacral spine who were the patients of Wojewódzki Szpital Zespolony im. L. Rydygiera in Toruń.

The criteria for inclusion: non-specific pain of the spine in its lumbar and sacral part which lasts no shorter than 3 months, age brackets 25-55.
The criteria fo exlusion: pain ailments which lasts shorter than 3 months, pregnancy, operative intervensions carried out on the spine, cancer diseases, traffic accidents or injuries, contraindications for the use of Kinesiology Taping

In the research a simple radomisation was chosen with the use of a list of random numbers generated by the computer. The patients were randomly divided into two groups of 25 people: 1) the study group, where the ligament application of Kinesiology Taping was used for seven days (KT+GE), 2) the control group: no application of Kinesiology Taping

(GE or ĆO). Both groups took general exercises commonly used in the treatment of non-specific pain ailments of the lumbosacral spine for seven days. The exercises used during the treatment were focused on exercising the strenght and the endurance of the lumbar muscles, the pelvic muscles and all the muscles of the lower limbs. The therapy was aimed at the training of such muscles as: the erector spinae, the gluteus, the rectus abdominis, the oblique abdominis, the quadriceps femoris and the back tighs muscles. Among the patients in the study group the ligament application of Kinesiology Taping was used with the tension of the strips 80%. Every patient underwent the medical consultation and the physiotherapy examination. Durring the assessment of the effectiveness of the therapy the NRS scale (Numerical Rating Scale)and the Oswestry Low Back Pain Disability Scale questionnaire were used. Statistical analysis was made in Statistica 12.5. Statistical significance was taken as <0,05.

Results.

Before the therapy in both groups the results of pain intensity in the NRS scale were similar. Both in the KT+GE group and in the GE group the average pain intensity was 6,20 (median 6,00). Minor differences were observed in both groups only in the regard to the minimum and the maximum values before the treatment. At the end of the treatment in the KT+GE group the decrease of the average pain intensity was observed from 6,20 to 2,12 (median 6,00 vs 2,00). The decrease of the average pain intensity was also noted in the GE group from 6,20 to 3,48 (median 6,00 vs 4,00).

Tab. I. The descriptive statistics – the pain intensity (NRS) before and after the therapy

Variable	The aggregated results The descriptive statistics							
	Type of intevension	M	Me	Min	Max	Lower quartile	Upper quartile	SD
NRS scale- before	KT+GE	6,20	6,00	4,00	8,00	6,00	7,00	0,86
NRS scale- before	GE	6,20	6,00	5,00	7,00	6,00	7,00	0,67
NRS scale- after	KT+GE	2,12	2,00	1,00	5,00	2,00	3,00	0,92
NRS scale- after	GE	3,480	4,00	2,00	5,00	3,00	4,00	0,82

The statistical analysis showed that both forms of the therapy had a beneficial and statistically significant -p<0,05 impact on the pain intensity in the NRS scale among the patients with the pain in the lumbosacral part.

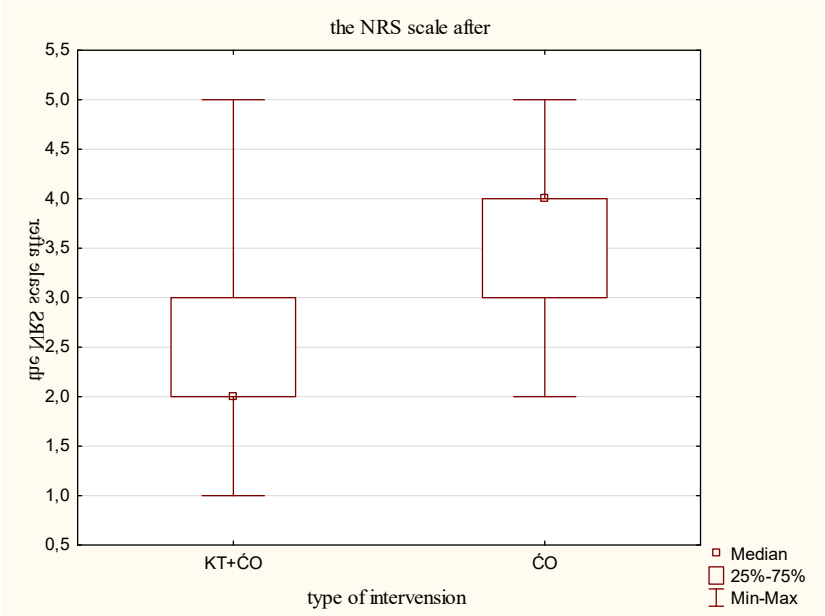
Tab. II. The comaprison of the pain intensity (NRS) before and after the therapy in both groups

Pair of variable	The aggregated results The Wilcoxon signed-rank test Marked results are statistically significant p <,05000			
	Type of intervention	T	Z	p
NRS scale- before & NRS scale- after	KT+GE	0,00	4,372373	0,000012
NRS scale- before & NRS scale- after	GE	0,00	4,372373	0,000012

Tab. III. The comparison of the pain intensity (NRS) after the therapy between the groupspo terapii pomiędzy badanymi grupami

VARIABLE	U Manna-Whitney test with the respect to the variable: type of intervension; statistically significant results with p <,05000				
	The sum of rank KT+GE	The sum of rank GE	U	Z	p
The NRS scale- after	412,0000	863,0000	87,00000	-4,36564	0,000013

The statistical analysis showed that patient who underwent KT+GE therapy achieved statistically significantly – **p<0,05** lower pain intensity values in the NRS scale than people from the GE group.



Dwg. 1. The comparison of the pain intensity (NRS) after the therapy between both groups.

The statistical analysis showed that in both groups the decrease of the average and the median of ODI Sum was observed. In the KT+GE group after the therapy the decline was

showed: the average from 19,20 to 8,12 and the median from 17,00 to 8,00. In the GE group the decrease was presented: the average from 20,28 to 10,80 and the median from 19,00 to 10,00.

Tab. IV. The descriptive statisticst– ODI sum before and after the therapy according to the groups

Variable	The aggregated results The descriptive statistics							
	Type of intervension	M	Me	Min	Max	Lower quartile	Upper quartile	SD
ODI Sum- before	KT+GE	19,20	17,00	7,00	33,00	15,00	24,00	6,97
ODI Sum- after	KT+GE	8,12	8,00	1,00	17,00	5,00	12,00	4,59
ODI Sum- before	GE	20,28	19,00	5,00	30,00	16,0	25,00	5,99
ODI Sum- after	GE	10,80	10,00	5,00	19,00	8,00	14,00	4,05

The statistical analysis showed that both forms of the therapy had a beneficial and statistically significant -p<0,05 impact on the ODI sum variable among the patients with the pain in the lumbosacral part.

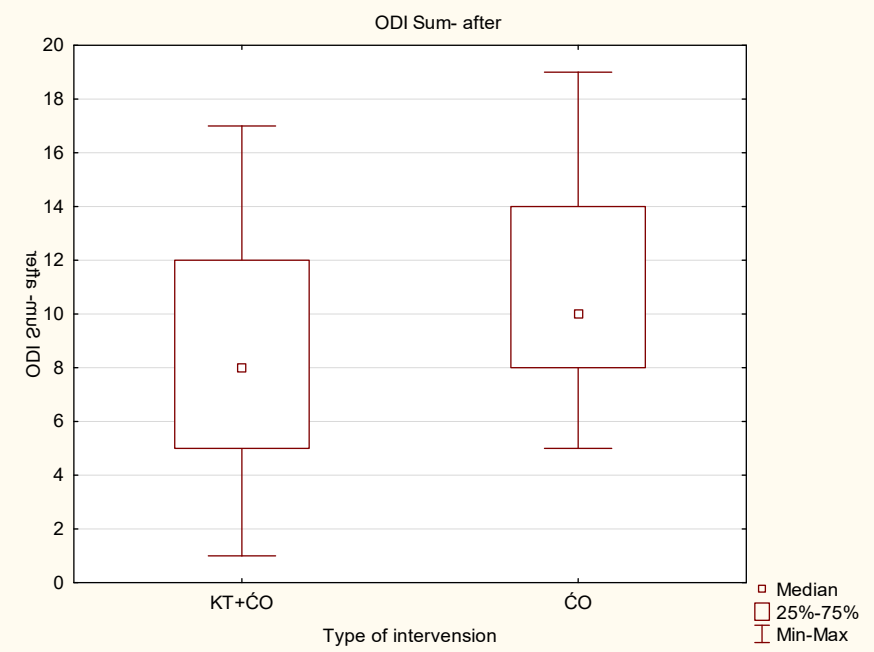
Tab. V. The comparsion of ODI Sum after the therapy between the groups

Pair of variable	The aggregated results The Wilcoxon signed-rank test Marked results are statistically significant p <,05000			
	Type of intervension	T	Z	p
ODI Sum- before & ODI Sum- after	KT+GE	0,00	4,372373	0,000012
ODI Sum- before & ODI Sum- after	GE	0,00	4,285714	0,000018

The statistical analysis showed that patient who underwent KT+GE therapy achieved statistically significantly – **p<0,05** lower pain values of ODI Sum than people from the GE group.

Tab. 1. VI. The comparison of ODI Sum after the therapy between the groups

Variable	U Manna-Whitney test with the respect to the variable: type of intervension; statistically significant results with p <,05000				
	The sum of rank KT+GE	The sum of rank GE	U	Z	p
ODI Sum- after	534,5000	740,5000	209,5000	-1,98879	0,046725



Dwg. 2. The comparison of ODI Sum after the therapy between the groups

Discussion.

The aim of the research was the assessment and the comparison of the effects of two methods of the treatment of the pain ailments of the spine (the therapy based on general exercises focused on the lumbosacral spine combined with Kinesiology Taping and the therapy based on general exercises). In the own study it was showed that both methods of the treatment had a statistically significant impact on the decrease of pain intensity in the NRS scale, life quality and the range of mobility among people with the spine pain ailments in the lumbosacral part. However, the therapy during which the Kinesiology Taping was implemented was statistically significantly more effective.

Participants of both groups were doing general exercises. The researches demonstarted that the movement weakens the feeling of the pain as a result of the release of endorphines, minimalises the sypmptoms of anxiety and depression, influences on the improvement of the mood and eliminates the sleep disorders [8].

An interesting finding of several studies is that in case of the acute pain ailments the kinesitherapy does not have spectacular effects, while the implementation of general exercises in the treatment of the chronic pain ailments of the spine is more effective than the pharmacotherapy, lying on the bed, the physiotherapy or the massage [8].

When it comes to the effects of Kinesio Taping on the pain, its mechanism of functioning is assocciated with the pain pathway. During any inflammation, swelling, increased muscular tension, muscle overload or injury the space between the skin and the external layer of the fascia reduces. The decresed space between the tissues results in the reduction of lymph flow and causes its thickening. The growth of lymph densisty creates the condition for the increased compression of pain receptors under the skin and on the surface of external fascia. Another important factor is the innfluence of Kinesiology Taping on the normalisation of muscle tension and the improvement of mobility range, which also influences the experiencing of the pain [19].

There are many studies confirming the effectiveness of the use of Kinesiology Taping in the treatment of pain ailments in the lumbosacral part. According to Paolini and his coeditors, [17] similiarly to the reasearch presented in this article, the influence of Kinesiology Taping on the pain ailments of the spine in its lumbar and sacral part was assessed. 39 people, aged 30-80, with chronic spine pain were examined. The patients had Kinesiology Tapes applied on their spine and they were exercising 3 times a week for half an hour. VAS and SEMG scale were used durring the assessment of the therapy's effectiveness. The decrease of pain and tension and the improvement of muscles functionality were observed after the implementation of the above mentioned procedures .

Chen and coeditors [20] carried out an interesting study concerning the assessment of the effectiveness of Kinesiology Taping. The researchers compared the fascial application with the placebo application (the application with no application guidelines in the painful area). After two weeks it was showed that the fascial application was significantly better than the placebo application in the reduction of pain intensity (among the patients with the strongest pain). Interestingly, among the patients with the average pain intensity no difference was observed between the groups. A similar comparison (proper application vs placebo application) was made by Kim and coeditors [21]. They demonstrated the superiority of the Kinesiology Taping application over the placebo application.

The results similar to the ones presented in this research, regarding the influence of the Kinesiology Taping on the pain ailments of the spine, were also showed by other authors. [22,23,24,25,26,27]. It is worth mentioning that Kinesiology Taping may be successfully used in specific situations i.e. pain ailments of the spine among pregnant women [28].

The analysis of 10 most important basic life support systems of human body — cardiovascular (CVS), respiratory (RS), nervous (NS), digestive (DS), endocrine (ES),

immune (IS), excretory (EXS), brain (BS), musculo-skeletal (MSS), hematopoietic (HS) was carried out. Based on this analysis two levels of ensuring the reliability of organism's work were revealed: sequential and parallel.

The system of logical equations for reduced sequential system is: Ys1 = CVS RS BS, where is the notation for the conjunctions of set elements.

The system of logical equations for the reduced parallel system is: Ys2 = NS DS ES IS HS EXS MSS, where is the disjunction of the scheme elements.

Visualization of human STC changes the concept of the kinetics of age-related changes in the organism and the role of determinants of health as a stable factor accompanying a uniform, smooth transition from the most pronounced functions of the body to their gradual extinction.

For human STC is formulated the following regularity kinetics of involutionary processes: after 30 years of age in the human body morphological changes regress in arithmetic progression, and the functions of organs in a geometric one.

Assumption of health as a state redundancy of functions is suggested [29].

The research is devoted to the fundamental issue of medicine and biology – the study of factors limiting the life span of a person. As a model, the system of adaptation of the human body to the forces of natural gravity is chosen, the disadaptation to which manifests itself in falls and everyday injuries. The object of the study was the selection of severe fractures of bone tissue due to fall, taken in the age aspect. Statistical and meta-analytical research methods were used. It is shown that the age-related increase in mortality due to household falls, coming to severe bone fractures, is non-linear and increases in geometric progression. As a result of the coincidence of the age characteristics of bone fragility and age-related kidney function, an assumption is made about the role of involution of the renal tissue in the development of osteoporosis in the elderly and the need for a new approach to the prevention of osteoporosis and domestic injuries [30].

The analysis of the professional literature and own research indicate that the Kinesiology Taping may be a useful and highly valuable form of the treatment of pain ailments of the lumbosacral spine. It may stand as a single method or it may complement other therapeutic methods or it may have preventic significance. However, it need to be mentioned that the best results in the treatment of pain spine ailments gives a complex therapy. Despite very good results achieved in this research, it should be emphasised that Kinesiology Taping is not a panacea for all the ailments and diseases of the spine and there is a strong need to seek new solutions, algorithms and methods of pain ailments of the spine.

Conclusions.

1. Both forms of the therapy influenced statistically significantly on the decrease of the pain intensity in the NRS scale among the patients with the pain ailments in the lubosacral spine. However, the therapy during which the Kinesiology Taping was implemented was statistically significantly more effective.

2. Both forms of the therapy influenced statistically significantly on the improvement of the quality of life among the patients suffering from the lumbosacral pain. However, the therapy during which the Kinesiology Taping was implemented was statistically significantly more effective.

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