

Ożóg Piotr, Natański Dawid, Radziwińska Agnieszka, Weber-Rajek Magdalena, Zukow Walery, Goch Aleksander. Evaluation of the effectiveness of Kinesiology Taping in the treatment of symptoms of gonarthrosis - a pilot study. *Journal of Education, Health and Sport*. 2018;8(6):350-357. eISSN 2391-8306. DOI <http://dx.doi.org/10.5281/zenodo.1345792>
<http://ojs.ukw.edu.pl/index.php/johs/article/view/5818>
<https://pbn.nauka.gov.pl/sedno-webapp/works/873755>

The journal has had 7 points in Ministry of Science and Higher Education parametric evaluation. Part b item 1223 (26/01/2017).
1223 Journal of Education, Health and Sport eissn 2391-8306 7

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The authors declare that there is no conflict of interests regarding the publication of this paper.

Received: 01.06.2018. Revised: 08.06.2018. Accepted: 30.06.2018.

Ocena skuteczności aplikacji Kinesiology Taping w leczeniu objawów zmian zwyrodnieniowych stawów kolanowych – badanie pilotażowe

Evaluation of the effectiveness of Kinesiology Taping in the treatment of symptoms of gonarthrosis - a pilot study

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Streszczenie

Cel pracy

Ocena skuteczności aplikacji Kinesiology Taping w leczeniu objawów choroby zwyrodnieniowej stawów kolanowych.

Material

W badaniu udział wzięło 40 osób z chorobą zwyrodnieniową stawów kolanowych, potwierdzoną na podstawie rozpoznania lekarskiego. Badani zostali losowo podzieleni na dwie grupy: Grupa badana (n=20) i grupa kontrolna (n=20)

Metodyka

Pacjenci z obu grup przed badaniem wypełniali ankietę zawierającą podstawowe pytania dotyczące płci, wieku, wzrostu i wagi. U wszystkich pacjentów obliczono Wskaźnik Masy ciała (ang. *Body Mass Index* – BMI). Przed terapią oraz po terapii w obu grupach dokonano:

- oceny poziomu bólu, sztywności i funkcjonalności stawu kolanowego za pomocą skali WOMAC;
- ocenę funkcjonalności za pomocą testu „wstań i idź”.

Wyniki

W grupie pacjentów, u których wykonano aplikację Kinesiology Tapingu wykazano znaczną redukcję bólu i sztywności oraz poprawę funkcjonalności stawu kolanowego (skala WOMAC i test „wstań i idź”). W grupie kontrolnej nie wykazano istotnych statystycznie różnic przed

terapią i po terapii we wszystkich domenach skali WOMAC, natomiast wykazano istotnie statystyczne pogorszenie wyników testu „wstań i idź”. Porównując wyniki grupy badanej i kontrolnej po terapii wykazano istotne statystycznie różnice - lepsze wyniki uzyskano w grupie badanej.

Summary

The aim

Evaluation of the effectiveness of Kinesiology Taping in the treatment of gonarthrosis

Material and Methods

The study included 40 patient with osteoarthritis of the knee joints, confirmed on the basis of a medical diagnosis. The subjects were randomly divided into two groups: Study group (n = 20) and control group (n = 20)

Patients in both groups before the study completed a questionnaire containing basic questions about gender, age, height and weight. The Body Mass Index (BMI) was calculated for all patients. Before and after therapy, both groups were:

- assessment of the level of pain, stiffness and functionality of the knee joint using the WOMAC scale;
- assessment of the functionality using the Time Up and Go test.

Results

In the group of patients who underwent the Kinesiology Taping application, significant reduction of pain and stiffness as well as improvement of knee function was demonstrated (WOMAC scale and the Time Up and Go test). In the control group, there were no statistically significant differences before and after therapy in all domains of the WOMAC scale, while a statistically significant worsening of the results of the Time up and Go test was demonstrated. Comparing the results of the study group and control after treatment, statistically significant differences were found - better results were obtained in the study group.

Słowa kluczowe: choroba zwyrodnieniowa stawów, Kinesiology Taping

Key words: osteoarthricis, Kinesiology Taping

Admission

Epidemiological data indicate that osteoarthritis (osteoarthricis - OA) is one of the largest causes of disability worldwide [1,2]. Therefore, prevention and the search for the most effective treatments for OA has become a major challenge for public health [3]. Although the disease is progressive, properly applied treatment can delay its development and the importance of improving the quality of life of patients. The main aim of the treatment of osteoarthritis of the knee It is to reduce pain and improve functional capabilities of movement of the patient. Among the treatments for OA important physiotherapy methods take place. One of the commonly used, safe and non-invasive methods is elastic therapeutic tape (ang. Kinesiology Taping - KT). It is a method that involves the application on the patient's body special patch up with parameters similar to human skin, which are designed to stimulate the body's self-healing processes, referred to respectively as directed by a physiotherapist

compensation. It consists of paving the proprioceptive processes, normalize muscle tone, stimulate the lymphatic system and the microcirculation, as well as the pain threshold. [4,5]

Objective of the work

Assess the effectiveness of the application of Kinesiology Taping in treating the symptoms of osteoarthritis of the knee.

Material and methods

stuff

The study involved 40 people with symptoms gonarthrosis, confirmed by a medical diagnosis. The subjects were randomly divided into two groups. Were randomized simple. Prepared closed envelope with information about the assignment to the groups, which were randomly selected for allocation.

- The study group (n = 20) - GB (12 women and 8 men) who applied Kinesiology Taping application.
- The control group (n = 20) - GC (11 women and 9 men), which are not in any therapeutic interventions.

methods

Patients from both groups before the study completed a questionnaire with basic questions concerning sex, age, height and weight. All patients were calculated body mass index (ang. Body Mass Index - BMI). Before therapy and after three days in both groups were made:

- assess the level of pain, stiffness and function of the knee using the WOMAC scale;
- assessment of functionality using test "get up and go."

WOMAC scale (Western Ontario and McMaster Universities Index of Osteoarthritis) It is used to assess pain in patients with osteoarthritis of the knee or hip, but it can also be used in patients with other diseases of the musculoskeletal system. The scale is used to assess the progress of osteoarthritis and the effectiveness of treatment. The patient can fill out the questionnaire themselves, assessing 24 questions in the following three aspects:

- the severity of the pain (5 questions) - when walking, climbing stairs, at night, while resting, loading the pond;
- joint stiffness (2 questions) - morning stiffness during the day;
- physical functioning (17 questions) - everyday activities: walking up the stairs, standing up, leaning, standing, walking, getting in the car and out of the car, shopping, dressing and taking off socks, getting up from the bed, lying in bed, climbing into the tub / out of the bath, sitting, using the toilet, heavy housework, light housework.

Each question has a 5-point scale of response (0-4) depending on the symptoms, or difficulties in performing the activity. The resulting number of points of the three groups together produce a global score. The maximum allowed number of points is 96: pain intensity - 20 points, stiffness - 8 points, physical function - 68 points [6].

Test Time Up and Go (TUG) It is a fast and simple tool to assess mobility, especially elderly patients. TUG test is one of the functional tests recommended by the Osteoarthritis Research Society International (OARSI) for the evaluation of patients with osteoarthritis of the hip or knee. The test consists in measuring the time from a patient getting up from a chair, transitions m 3, rotation of 180 ° and return to the re-sitting position on a chair. Normally, the time to perform this task should be below 10 s. [7].

Two applications were made in accordance with the methodology of Kinesiology Taping: the application on the muscle quadriceps ligament and the application on the right patella. In order to improve the stability special applications additionally used in aerosol adhesive Mueller Tuffner Pre-Adherent tape Tape. According to the theory of Kinesiology Taping

applications were used to relieve musculo - fascial around the belly and the attachment end quadriceps and patellar area.



Fig. 1. Application of the quadriceps and patellar ligament appropriate

Exclusion criteria were: abdominal skin lesions thigh and knee joint which are applied to the contraindication Kinesiology Taping (the test group) and the use of other forms of physiotherapy in the last month (test group and control).

Results

Table I presents the results of a comparative analysis of all the variables investigated between study and control groups.

Tab. I. Descriptive statistics and t - Student test to compare the results of all the variables examined prior to treatment in the study group and the control group

variable	descriptive statistics					T-test		
	n	x	min	max	SD	Statistics t	p	
Age	GB	20	63.50	45	82	9.95	0.897	0.375
	GK	20	60.20	42	83	13.09		
BMI	GB	20	30.59	23.05	40.89	4.57	2,011	0.051
	GK	20	28.00	22.83	35.75	3.49		
WOMAC - pain	GB	20	7.55	2.00	12.00	3.08	-0.528	0,600
	GK	20	8.05	3.00	13.00	2.89		
WOMAC - stiffness	GB	20	3.35	0.00	5.00	1.53	0.380	0.705
	GK	20	3.15	0.00	6.00	1.78		
WOMAC - physical functioning	GB	20	32.05	3.00	50.00	13,21	1,111	0.273
	GK	20	28.25	14.00	41,00	7.70		
TUG	GB	20	12.34	7.67	29.61	4.69	-0.941	0.352
	GK	20	13.40	10.08	16.91	1.76		

GB -user test GK - control group, n - number of observations; arithmetic average; Min - minimum; Max - maximum; SD - standard deviation, t-value t - Student test, p - level of significance

Comparing the value of p t - test Student's t statistic based on the significance level $\alpha = 0.05$ was found that there was no statistically important difference between the results of all the

variables tested before therapy between the two groups. This demonstrates the homogeneity of the groups.

Table II shows the descriptive statistics and results of t-test to compare the results before treatment after treatment with the results to the results of the test and WOMAC "get up and go" in the study group.

Tab. II. The descriptive statistics and Student - t test to compare the results with the results prior to treatment after treatment in the test group

variable		descriptive statistics					T-test	
		n	x	min	max	SD	Statistics t	p
WOMAC - pain	before	20	7.55	2.00	12.00	3.08	6.457	0,000
	after	20	2.95	0.00	13.00	3.39		
WOMAC - stiffness	before	20	3.35	0.00	5.00	1.53	4,611	0,000
	after	20	1.80	0.00	5.00	1.32		
WOMAC - physical functioning	before	20	32.05	3.00	50.00	13,21	-5.723	0,000
	after	20	12.75	0.00	42,00	10.72		
TUG	before	20	12.34	7.67	29.61	4.69	-4.896	0,000
	after	20	10.99	6.77	29.09	4.69		

N - number of observations; arithmetic average; Min - minimum; Max-maximum; SD - standard deviation, t-value t - Student test, p - level of significance

Comparing the value of p t - test Student's t statistic based on the significance level $\alpha = 0.05$ has been found that there are statistically important difference between the results of all tested variables before and after treatment in the test group. After treatment in the test group was obtained a clear improvement in all the domains and the test WOMAC "get up and go."

Table III shows the descriptive statistics and results of t-test to compare the results before treatment after treatment with the results to the results of the test and WOMAC "get up and go" in the control group.

Tab. III. The descriptive statistics and Student - t test to compare the results with the results prior to treatment after treatment in the control group

variable		descriptive statistics					T-test	
		n	x	min	max	SD	Statistics t	p
WOMAC - pain	before	20	8.05	3.00	13.00	2.89	-0.529	0.602
	after	20	8.20	3.00	13.00	2.94		
WOMAC - stiffness	before	20	3.15	0.00	6.00	1.78	0.718	0.481
	after	20	3.30	1.00	6.00	1.49		
WOMAC - physical functioning	before	20	28.25	14.00	41,00	7.70	-1,088	0.289
	after	20	28.80	13.00	42,00	8.04		
TUG	before	20	13.40	10.08	16.91	1.76	-3.177	0,004
	after	20	13.61	10.04	17.03	1.78		

n - number of observations; arithmetic average; Min - minimum; Max-maximum; SD - standard deviation, t-value t - Student test, p - level of significance

Comparing the value of p t - test Student's t statistic based on the significance level $\alpha = 0.05$ was found that there was no statistically important difference between the results of all domains WOMAC scores before and after treatment in the control group. Comparing the value of p t - test Student's t statistic based on the significance level $\alpha = 0.05$ has been found that there are statistically important difference in the test results "get up and go" before and after treatment in the control group. In the control group demonstrated the deterioration of the functionality as measured by the "get up and go."

Table IV shows the descriptive statistics and results of t-test for comparison of results between the treatment groups were control group.

Tab. I. Descriptive statistics and t - Student test to compare the results of all the variables tested the therapy in the study group and the control group

variable		descriptive statistics					T-test	
		n	x	min	max	SD	Statistics t	p
WOMAC - pain	GB	20	2.95	0.00	13.00	3.39	-5.221	0,000
	GK	20	8.20	3.00	13.00	2.94		
WOMAC - stiffness	GB	20	1.80	0.00	5.00	1.32	-3.367	0.001
	GK	20	3.30	1.00	6.00	1.49		
WOMAC - physical functioning	GB	20	12.75	0.00	42,00	10.72	-5.333	0,000
	GK	20	28.80	13.00	42,00	8.04		
TUG	GB	20	10.99	6.77	29.09	4.69	-2.330	0,025
	GK	20	13.61	10.04	17.03	1.78		

GB -user test GK - control group, n - number of observations; arithmetic average; Min - minimum; Max - maximum; SD - standard deviation, t-value t - Student test, p - level of significance

Comparing the value of p t - test Student's t statistic based on the significance level $\alpha = 0.05$ has been found that there are statistically important difference between the results of all the variables investigated after treatment between the test group and the control group. After treatment in the test group gave better results in all the domains and the test WOMAC "get up and go" compared to the control group.

Discussion

This study aimed to assess the effectiveness of Kinesiology Taping in leceniu symptoms of osteoarthritis of the knee. The average age in the study group was 62 years, and the majority were women (58%), which is consistent with epidemiological data [8]. Also collected data on the patient's height and weight to calculate BMI. The average score of BMI in the whole group was 29.29, which indicates the upper limit of overweight. Being overweight is one of the risk factors for degenerative changes in the knee joints. The reason for the development of degenerative changes in the course of being overweight is mechanical overload of the joints and the metabolic factors [9], and the reduction efficiency increases with increasing body weight [10]. Still they sought optimal treatment of the disease. among them a prominent place physiotherapy methods. In the present study was to evaluate the effectiveness of one of them - a dynamic slicing. Our results show the effectiveness of this method - achieved a statistically significant reduction of pain, decrease joint stiffness and to improve the functional capabilities of patients in the group treated with Kinesiology Taping applications. Evaluation of the effectiveness of this therapeutic method to treat the symptoms of degenerative changes in the knee joints have been studied by many authors, but the results are not conclusive. Kocyigit et

al. [11] The study took 41 patients diagnosed with osteoarthritis of the knee according to the American College of Rheumatology, who were randomized to the placebo group and KT. In both groups before treatment and after its completion was made: the assessment of pain using the VAS scale, functional assessment using the Lequesne Index and the quality of life using the Nottingham Health Profile. KT application was loaded three times, every four days. No significant differences between groups, and the authors have proposed that the presented results indicate ambiguous evidence of the beneficial effects of KT to treat the symptoms of OA.

Cho et al. [12] joined to test 46 individuals with osteoarthritis of the knee who were randomly assigned to two treatment groups and the placebo group KT. Before and after the intervention of pain intensity was measured using the VAS at rest and during walking, pain thresholds using algometer quadriceps muscle and tibialis anterior. Measurement was also made active range of motion (ang. Active range of motion - arom) and proprioception. The results of the study showed improvement in all the variables studied in the group treated with KT.

KT positive results on the reduction of pain, stiffness and function knee OA has also been shown in studies Rahl et al. [13]. The study Anandkumara et al. [14] after the application of CT in patients with osteoarthritis of the knee joint in addition to pain reduction reported to have increased the strength of the quadriceps muscle. Li et al. [15] made in 2018 meta-analysis of studies in which the effect KT reduction of pain, stiffness and function of the knee joint proprioception and muscle strength in patients with OA. The authors of the meta-analysis also drew attention to the possibility of adverse events after application of KT. The results of this review showed that there is little evidence on the effectiveness of KT in treating the symptoms of osteoarthritis of the knee, but the authors draw attention to the moderate and low quality of the studies included in the analysis.

The authors of this study also aware of the imperfections of the study, so we treat them as a test pilot. The strengths of the study should be the introduction of a control group and randomization. The control group showed a high homogeneity in relation to the research group (Tab. I). While the weaknesses to be relatively small study group and heterogeneity within groups.

Conclusions

The results of this study show that KT may be an effective treatment for the symptoms of OA, but you should continue research with a well-designed research protocol

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