Assessment of the Effectiveness of Classic Massage with the Use of Trigger Points Therapy Elements in Patients Suffering from Pain in the Lumbosacral Spine

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Abstract

Introduction: Nowadays, back pain is a very common problem, especially in the area of lower back. Classic massage is one of the methods of reducing back pain and is included in the therapeutic procedure. **Purpose:** The purpose of the study was to compare the effectiveness of classic massage and massage with the trigger points therapy elements in patients with painful ailments by cutting the lumbosacral spine. **Material and method of the study:** The study involved 84 patients with pain in the lumbosacral spine. The subjects were divided into two groups. Group I included 42 people (50.0%) who received classic massage, and group II included another 42 people (50.0%) who received classic massage with the trigger points therapy elements. A proprietary questionnaire was used for the analysis, which allowed for the assessment of the effectiveness of the applied treatment, supplemented with the VAS scale and the Thomayer test.

Results: The results of the study show a statistically significant difference between the intensity of perceived pain measured before and after the procedures in both group I ($p<0.001$) and group II ($p<0.001$). The average improvement achieved by the patients from group I was 2.88 points, and by the patients from group II to 4.48 points. On the other hand, the average improvement in the Thomayer test obtained by the patients from group I was 2.12 cm, and by the patients from group II was 3.68 cm. The difference in the treatment effect in the two groups was statistically significant ($p<0.001$).

Conclusions: Classic massage with the trigger points therapy elements has a better effect on improving spine mobility in the patients with pain in the lumbosacral spine and reduces pain to a greater extent compared to classic massage.

Key words: rehabilitation, massage, trigger points therapy

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Introduction

Nowadays, diseases and ailments of the musculoskeletal system of the spine are diagnosed more and more often in the society. This is one of the key social, economic and medical problems [1], and is associated with a change in the human lifestyle, minimised physical effort, which results in muscle weakness, obesity, the formation of an incorrect body posture or inappropriate stress on the spine during work. Pain syndromes of the lumbosacral spine often begins chronic, progressive ailments causing disability, inability to work actively and limitations of activity in every-day life [2].

Pain in the lumbosacral spine is associated with discopathy or the presence of a root conflict the most often. In addition, other possible sources of pathology should not be ignored, e.g., in hip joints, sacroiliac joints, inter-process joints, as well as rheumatic, oncological and myofascial grounds [3]. As a result of high mobility in the lumbar spine and the loads it is exposed to, pain symptoms occur at the level of 65% [4]. According to studies conducted in Poland, 72% of people under 40 years of age experience lower back pain, and as far as people over 40 years of age are concerned, it concerns 30% of women and 66% of men [5].

The first information about massage appeared approximately 3000 BC. However, when it comes to applying it in medicine, the first study on its effects and physiology was carried out by the doctor and surgeon, Ambrose Pare, in the 16th century. Classic massage consists in mechanical deformation of tissues and thus causing an indirect and direct influence on individual systems in the human body. It can be defined as a set of different grips that are performed in the correct order, and their effect is to induce a tissue reaction [6, 7].

Classic message causes beneficial effects when treating back pain by reducing muscle tension, reducing pain sensitivity or increasing local blood supply. Therapeutic massage significantly affects the emotional state, reduces tension and stress, which is helpful in the treatment of back pain. Patients assess the procedure as pleasant and relaxing, which positively influences the healing process and constitutes a safe and effective therapy [8].

Aim

The purpose of the study was to compare the effectiveness of classic massage and massage using the trigger points therapy elements in the treatment of pain in the lumbosacral spine.

Material and method of the study

Characteristics of the examined group

The study was carried out in a group of 61 women (72.6%) and 23 men (27.4%). Women were the majority in each group. The groups did not differ significantly in terms of gender structure (p=0.807) (Table 1).

The study involved 84 patients with pain in the lumbosacral spine. The subjects were divided into two groups created according to the type of surgery that was used to reduce their pain. The criterion for inclusion of the patient in group I was the carried-out classic massage treatment (the group consisted of 42 people; 50.0% of the total), the inclusion criterion in group II was the classical massage treatment with the trigger points therapy elements (42 people; 50.0% of the total) (Table 2.).

Study tool

A proprietary questionnaire was used for the analysis, which allowed for the assessment of the effectiveness of the applied treatment, supplemented with the VAS scale and the Thomayer test. The VAS scale is a visual-analogue scale for assessing the level of perceived pain. The patients ticked the intensity of pain twice: before and after rehabilitation, in points from 0 to 10. However, the Thomayer test was used to assess the extent of forward flexion of the spine [9].

Data analysis

Statistical analysis of the collected material was carried out in the Statistica 13.1 package. Only non-parametric tests were used to analyse the

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variables. The choice of this type of tests was conditioned by the failure to meet the basic assumptions of the parametric tests, i.e., the compliance of the distributions of the studied variables with the normal distribution, which was verified with the Shapiro-Wilk test. The Mann-Whitney U test was used to assess the differences in the two compared groups. The Wilcoxon's pairwise test was used to assess the within-group variability in the two populations. The Cramer's V (2x3, 4x5, etc. tables) and Phi (2x2 tables) tests were used to assess the relationship between the selected variables for questions on nominal scales. They are measures of symmetry based on the chi-square test that provide information on the strength of the relationship between the variables in the crosstabs. All measures of compound strength are normalised to take values between (0–1), so, respectively from 0–0.29 – weak dependence, 0.30–0.49 – moderate dependence, 0.5–1 – strong correlation [10]. Descriptive statistics were calculated for numerical variables, i.e., mean, median, minimum, maximum, the first and the third quartiles and standard deviation. The level of statistical significance was $p<0.05$.

Results

The mean age of all patients was 51.7±13.98 years. The mean age of the patients in group I was 52.95±15.02 years, while the mean age of the patients in group II was 50.45±12.92 years. The age of the patients from the two groups did not differ significantly (p=0.239). The group was homogeneous in terms of age (Table 3).

The mean duration of pain was 88.11 months, mean 102.62 months for the subjects from group I and 73.6 months for subjects from group II. This difference was statistically insignificant (p=0.205). The chronic nature of the perceived back pain was confirmed over time (Table 3).

The degree to which pain made it difficult for the patients to perform in everyday life was rated on a scale from 0 to 10 points, where more points meant greater difficulties caused by pain. The level of the impact of pain on the performance of everyday activities was estimated at 4.73 points in the total number of the patients ±1.72 points. In group I, the

average score was 4.81 points, and in group II, 4.64 points. This difference was statistically insignificant (p=0.333) (Table 3).

The effectiveness of the classic massage treatment was rated on a scale from 0 to 10 points, where the higher number of points meant greater effectiveness. The effectiveness of the applied treatment was determined in group I at the average level of 6.05 points, ±2.34 points, while in group II at the average level of 6.1 points ±2.36 points. This difference was statistically insignificant (p=0.606) (Table 3).

The presence of a statistically significant difference between the range of spine mobility in the measurement before and after the procedures was confirmed both in group I (p<0.001) and in group II (p<0.001). As far as the patients of group I are concerned, the average result of the Thomayer test was 10.93 cm measured before the treatment, and 8.81 cm after the treatment. As far as the patients of group II are concerned, the average result of the Thomayer test was 8.67 cm measured before the treatment, and 4.99 cm after the treatment. The average improvement achieved by the patients from group I was 2.12 cm, and by the patients from group II to 3.68 cm. The difference in terms of the effect applied in the two treatment groups was statistically significant (p<0.001). Similarly, the range of spine mobility found in the two groups in the measurement after the treatment was significant (p=0.013). However, no statistically significant differences in terms of the range of spine mobility were confirmed in the two groups measured before the therapy (p=0.216) (Table 4).

There was a statistically significant difference between the magnitude of the perceived pain intensity measured before and after the procedures, both in group I (p<0.001) and in group II (p<0.001). As far as the patients from group I, the average pain intensity before the treatment was estimated at 5.93 points, and after the treatment at 3.05 points. As far as the patients from group II, the average pain intensity before the treatment was estimated at 6.36 points, and after the treatment at 1.88 points. The average improvement achieved by the patients from group I was 2.88 points, and by the patients from group II to 4.48 points. The difference in terms of the effect applied in the two treatment groups was statistically significant (p<0.001). Similarly, the level of pain intensity experienced by the patients from the two groups when measured after the treatment

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(p<0.001) was significant. There were no statistically significant differences in pain intensity in the two groups measured before the therapy (p=0.145) (Table 4).

In the whole series of treatments, all patients assessed the first one as the most painful. Most respondents believed that the first treatments were very painful, and the subsequent ones were more and more pleasant (40 people – 47.6%). It was shown that the patients from group I felt well during the whole series of treatments without increasing pain statistically more often than the patients from group II. In addition, the patients from group II declared that the first treatments were very painful, the next ones are more and more pleasant, and the improvement was felt after the first treatments statistically more often than the patients from group I. This relationship was statistically significant (p<0.001) with a moderate strength of the relationship (Cramer V=0.46) (Table 5).

The massage treatments were pleasant for the majority of the patients; only some grips were felt more by them (43 people – 51.2%). The patients from group II indicated the feeling of pain during the procedure more often than the patients from group I, while the patients from group I more often indicated that the procedure was painless. This difference was statistically significant (p<0.001), and the described relationship was strong (Cramer V=0.56) (Table 6).

Discussion

Modern lifestyle affects the intensification of degenerative processes within the musculoskeletal system. Increased tension of the paraspinal muscles always occurs during spinal overload disease, and long-term contracted muscles cause back pain. Increased muscle tension affects the blood supply to the muscle, causing the accumulation of metabolic products in it. In classic massage, the mechanical stimulus directed at the patient's tissues causes numerous changes as well as local and general reactions. The local action consists in the local expansion of blood and lymph vessels as a result of the techniques used. The consequence of these actions involves the improved disturbed tissue metabolism. Central action affects the body through the nervous system. Irritation of extero-

and prioprioceptors (skin, skeletal muscles) causes increased impulsation of the cerebral cortex, stimulating nerve conduction and influencing the normalisation of the functioning of internal organs. Depending on the massage techniques used, it can have a stimulating or toning effect on the nervous system [11]. During the massage, it is possible not only to easily feel the trigger points, but also to effectively prevent their formation, reduce the intensity of pain through their earlier detection and treatment [12].

In the light of the conducted study, the feeling of back pain after the therapeutic massage decreased significantly [13]. In addition, the habitual attitude adopted during the pain was abolished [14]. It was noticed that massage has a statistically significant ($p<0.05$) effect on reducing back pain in the lumbosacral region [15], on improving the quality of life [16] and increasing the level of physical activity [8]. In connection with the patient education about the correct posture and proper movement habits, it can contribute to the prevention of future pain incidents [17].

The available literature confirms the effectiveness of the use of therapeutic massage in various forms in order to reduce pain in patients with back pain. In the studied group of the patients treated with therapeutic massage, a reduction in the level of pain assessed on the VAS scale was achieved [18].

The studies of Qiao J. et al. revealed statistically significant differences between the range of spine mobility in the measurements performed before and after the therapy ($p<0.001$) [19]. Classic massage positively impacted on the improvement of spine mobility in all three planes [20]. Both confirmed a statistically significant difference between the intensity of perceived pain measured before and after the procedures [21].

The studies carried out among 3,096 patients over 18 years of age revealed the fact that there is no certainty that massage is an effective method of treating pain in the lower spine. In acute, subacute and chronic conditions, improvement of pain results with massage was shown only in a short period of observation. Functional improvement was observed in subacute and chronic participants, but only in short period of observation [22].

Classic massage in combination with elements of trigger points therapy is a valuable and effective technique aimed at alleviating back pain.

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After a series of classical massage treatments with the trigger points elements, a statistically significant (p<0.05) reduction of pain in the lumbosacral spine was achieved. In addition, the patients achieved the improvement in everyday activities. A decrease in palpation tenderness of soft tissues was observed, but no improvement in the range of mobility of the spine and chest was noted [23]. According to the studies carried out by Kocak A.O. et al., the use of the trigger points therapy elements reduces pain, where the mean VAS score decreased by 0.41±1.30 [24]. The use of the trigger points is an effective therapy, but long-term treatment is required in chronic cases [25].

The rehabilitation program for each patient should always be adapted and implemented individually. During therapy, some physiotherapeutic methods are combined to achieve better therapeutic effects.

Conclusions

1. Classic massage with the trigger points therapy elements significantly improves the mobility of the spine in the patients with pain in the lumbosacral spine compared to classic massage.
2. Classic massage reduces pain after the treatment to a lesser extent compared to classic massage with the trigger points elements.
3. There is a greater subjective feeling of pain in a massage treatment with the trigger points therapy elements in the first treatments compared to classic massage.

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Table 1. Division of the patients by gender

Gender	Group I		Group II		Total	
	n	%	n	%	n	%
Female	31	73,8%	30	71,4%	61	72,6%
Male	11	26,2%	12	28,6%	23	27,4%
Total	42	100,0%	42	100,0%	84	100,0%
p	$\chi^2(1)=0,06$ p=0,807					

n – number of observations; % – percent

Table 2. Type of carried out treatment

Type of carried out treatment	n	%
Classic massage	42	50.0%
Classic massage with the trigger points therapy elements	42	50.0%
Total	84	100.0%

n – number of observations; % – percent

Table 3. Analysis of the mean values of parameters in the compared groups

Variable	Group I		Group II		p
	$\overline{x}$	SD	$\overline{x}$	SD	
Age	52.95	15.02	50.45	12.92	0.239
Duration of pain (in months)	102.62	124.90	73.60	118.93	0.205
Degree to which pain makes it difficult for the patients to perform in everyday life (scale of 0-10 points)	4.81	1.86	4.64	1.57	0.333
Assessment of the effectiveness of classic massage	6.05	2.34	6.10	2.36	0.606

$\overline{x}$ – arithmetic average; SD – standard deviation; p – level of significance of differences

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Table 4. Assessment of the average parameters of the Thomayer test and the VAS scale in individual groups of the patients and in subsequent measurements

Variable	Group I		Group II		p
	$\overline{x}$	SD	$\overline{x}$	SD	
Thomayer test (before therapy)	10.93	8.32	8.67	6.75	0.216
Thomayer test (after therapy)	8.81	7.28	4.99	5.29	**0.013**
Difference	-2.12	3.40	-3.68	2.56	**<0.001**
VAS scale (before therapy)	5.93	1.47	6.36	1.08	0.145
VAS scale (after therapy)	3.05	1.40	1.88	1.17	**<0.001**
Difference	-2.88	1.71	-4.48	1.21	**<0.001**

$\overline{x}$ – arithmetic average; SD – standard deviation; p – level of significance of differences

Table 5. Feelings accompanying the treatments

Feelings accompanying the treatments	Group I		Group II		Total	
	n	%	n	%	n	%
The first treatments were very painful, the next ones were more and more pleasant	16	38.1%	24	57.1%	40	47.6%
Well-being during the entire series of treatments, no intensification of pain	20	47.6%	3	7.1%	23	27.4%
Malaise during the entire series of treatments	0	0.0%	0	0.0%	0	0.0%
Improvement was felt after the first treatments	6	14.3%	15	35.7%	21	25.0%
Total	42	100.0%	42	100.0%	84	100.0%
p	$\chi^2(2)=18.02$ p<0.001 V Cramer=0.46					

n – number of observations; % – percent; χ^2 – Pearson Chi^2 test result; p – level of significance of differences

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Table 6. Assessment of the pain intensity of the procedure

Assessment of the pain intensity of the procedure	Group I		Group II		Total	
	n	%	n	%	n	%
Painful	5	11.9%	25	59.5%	30	35.7%
Painless	10	23.8%	0	0.0%	10	11.9%
Very painful, hard to stand	1	2.4%	0	0.0%	1	1.2%
Pleasant, only some of the grips are felt more	26	61.9%	17	40.5%	43	51.2%
Total	42	100.0%	42	100.0%	84	100.0%
p	$\chi^2(3)=26.21$ **p<0.001 V Cramer=0.56**					

n – number of observations; % – percent; χ^2 – Pearson Chi^2 test result; p – level of significance of difference