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PART III. OTHER
DZIAŁ III. RÓŻNE

INCLUSION OF PELOTHERAPY IN THE TREATMENT OF PATIENTS WITH LUMBAR DISCOPATHY TREATED WITH LOW-FREQUENCY MAGNETIC FIELD AND KINESITHERAPY

OCENA WPŁYWU WŁĄCZENIA BOROWINOTERAPII DO LECZENIA PACJENTÓW Z DYSKOPATIĄ LĘDŹWIOWĄ ZABIEGAMI POLA MAGNETYCZNEGO NISKIEJ CZĘSTOTLIWOŚCI I KINEZYTERAPII

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B. Data collection/entry
zebranie danych
C. Data analysis/statistics
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D. Data interpretation
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F. Literature analysis/search
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Summary

Background. The study aims to evaluate the effect of the pelotherapy in the treatment of patients with lumbar discopathy treated with low-frequency magnetic field and kinesitherapy.
Material and methods. The study involved 79 persons randomly divided into 2 groups. The patients from group I (39 individuals) were subjected to pelvic therapy, low-frequency magnetic field and kinesitherapy. Those in the other group (40 individuals) were exposed to low-frequency magnetic field and kinesitherapy. To compare and assess the changes in both samples, the VAS pain scale and the Roland-Morris Disability Index were used, as well as the fingers-floor test to examine the range of mobility.
Results. There were no statistically significant differences between the examined groups ($p > 0.05$). Both groups benefited from the therapy. In the first one, there was a reduction in pain – Me = 1.0 point in the VAS scale and, according to the Roland-Morris Questionnaire, the degree of disability was reduced by Me = 1.0 point. A more significant increase in the range of motion of the lumbar spine was observed in group II, in which the range of mobility increased by Me = 2.0 cm in the fingers-to-floor test.
Conclusions. Incorporation of a pelotherapy into the treatment which consisted of low-frequency magnetic field and kinesitherapy did not significantly result in achieving a better therapeutic outcome.

Keywords: kinesitherapy, lumbar spine, discopathy, pelotherapy, low-frequency magnetic field

Streszczenie

Wprowadzenie. Celem pracy była ocena wpływu włączenia borowinoterapii do leczenia pacjentów z dyskopatią lędźwiową za pomocą pola magnetycznego niskiej częstotliwości i kinezyterapii.
Materiał i metody. W badaniu udział wzięło 79 osób, których losowo podzielono na 2 grupy. Pacjenci z I grupy (39 osób) poddani zostali zabiegom borowinoterapii, pola magnetycznego niskiej częstotliwości oraz kinezyterapii. Pacjenci z II grupy (40 osób) poddani zostali zabiegom pola magnetycznego niskiej częstotliwości i kinezyterapii. W celu porównania zachodzących zmian wykorzystano skalę bólu VAS, Indeks Niepełnosprawności Rolanda-Morrisa, ponadto oceniano zakres ruchomości w teście palce-podłoga.
Wyniki. Pomiędzy badanymi grupami nie zaobserwowano istotnych statystycznie różnic ($p>0,05$). W obu badanych grupach, w wyniku terapii, uzyskano zmniejszenie dolegliwości bólowych o Me= 1,0 punktu w skali VAS oraz zmniejszenie stopnia niepełnosprawności o Me = 1,0 punktu w Kwestionariuszu Rolanda-Morrisa. Większy wzrost zakresu ruchomości kręgosłupa lędźwiowego zaobserwowano w II grupie badanej u której zakres zwiększył o Me = 2,0 cm w teście palce-podłoga.
Wnioski. Włączenie borowinoterapii do schematu leczenia w postaci pola magnetycznego niskiej częstotliwości i kinezyterapii nie wpłynęło istotnie statystycznie na uzyskanie lepszych wyników terapii.

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Słowa kluczowe: kinezyterapia, kręgosłup lędźwiowy, dyskopatia, borowinoterapia, pole magnetyczne niskiej częstotliwości

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Introduction

Spine pain syndromes are a crucial clinical, social and economic problem, the solutions of which should be sought in devising appropriate methods of diagnosis, prevention and treatment. They are one of the leading causes of reducing the ability to perform work [1,2], which results in a deterioration of patients' quality of life, as well as increased funds necessary for financing long-term treatment. One of the main causes of spinal pain is discopathy.

The study aimed to evaluate the inclusion of pelotherapy in the treatment of patients with lumbar discopathy treated with physiotherapeutic procedures such as low-frequency magnetic field and kinesitherapy treatments.

Material and methods

The research was conducted in the years 2011-2013 at the Medical Center DMP in Lublin, after the approval to perform it was obtained from the Bioethical Committee of the Medical University in Lublin (KE-0254/2/2011). The study involved 79 patients, aged 18 to 65 years, diagnosed with discopathy in the lumbar region of the spine.

The research was prospective, and the patients were randomly assigned to two groups after medical qualification. Those in the first group (39 persons) were subjected to mud therapy, a low-frequency magnetic field and kinesitherapy, whereas the patients from the other group (40 persons) were treated with low-frequency magnetic field therapy and kinesitherapy.

The pulsed electromagnetic field (PEMF) therapy used a magnetic field of 3.8 mT induction, at frequency of 25 Hz, rectangular pulse of 10 ms duration and a break time of 30 ms. The treatments were performed with a magnetotherapy device BTL-5920 Magnet (manufacturer: BTL Poland, Ltd.) using a solenoid-shaped applicator. The duration of the procedure increased in the following treatment days and would vary from 15 to 20 minutes.

The treatments with the therapeutic mud were made using pre-made wraps of BIOCHEM Michalik GP in Bochnia. The peat mass, with the degree of humification value H = 5, was heated in the water kitchen to the temperature of about 42°C, and then applied to the patient's lumbar area. The treatment lasted 20 minutes.

Kinesitherapy consisted of performing exercises to strengthen the muscles involved in the stability of the trunk and the coordination of the diaphragmatic breathing track. Depending on the patients' individual needs, static stretching was also applied. The exercises were performed after the physiotherapeutic procedures under the supervision of a qualified physiotherapist. The exercise time would increase progressively from 15 to 30 minutes, which varied depending on the difficulty in their performance.

To compare the changes occurring under the influence of the treatment, the severity of pain was assessed twice, before and after the therapy, using the VAS pain scale [3,4], whereas the degree of disability was examined using the Roland-Morris Questionnaire (ODI) [5]. The range of the lumbar spine mobility was also assessed using the fingers-floor test [6,7].

The Microsoft Office 2013 (Excel programme) and the Stat Statictica PL programme by StatSoft (version 9.0) were used to perform calculations. To check the distribution of variables, the Kolmogorov-Smirnov test was applied, and to compare the differences between the analogous parameters, non-parametric tests were used. They considered statistically significant variations assuming the significance level was less than 0.05 ($p < 0.05$).

Results

The study was attended by 79 people, including 45 women (57%) and 34 men (43%). The youngest examined person was 29 years old, whereas the oldest – 65 years old. The mean age of the respondents was 54 years. Most of the patients – 63 persons (80%) were urban residents, while the remaining ones, i.e. 16 people (20%) came from the countryside. The majority were professionally active – 46 respondents (58%), while 33 respondents (42%) were not.

The most frequent pain symptoms were observed in those over 40 years of age – 36 persons (46%), whereas 26 patients (33%) had suffered from them since they were 30. The largest number of respondents – 29 persons (37%), suffering from the lumbar spine pain, had been treated for over 20 years, 21 people (27%) – for over 5 years, 18 persons (23%) – for over 10 years. At the same time, 57% of the respondents (45 persons) claimed that the back pains were the reason for their absence from work (several times), and only 21 of the examinees (27%) never took sick leave because of the symptom.

The changes in pain intensity in both groups were statistically significant ($p < 0.05$). The median pain in the first study group (pelotherapy, PM, kinesitherapy) was reduced from 4.5 to 4.0 points in the VAS scale after the treatment. 31 patients reported a reduction of pain (79.5%), 6 individuals (15.5%) did not see any change in the level of pain, whereas 2 patients (3%) experienced worsening of the symptoms. In the other group (the one

treated with the magnetic field, kinesitherapy), the median pain intensity was reduced from 5.0 to 4.0 on the VAS scale. In 36 individuals (90%) pain was reduced, in 3 respondents (7.5%) its level did not change, and in 1 person (2.5%) the symptoms worsened (Figure 1). The median scale reduction in the level of perceived pain in both groups was Me = -1.0, which was not statistically significant as for the variation between the groups (p> 0.05) (Table 1).

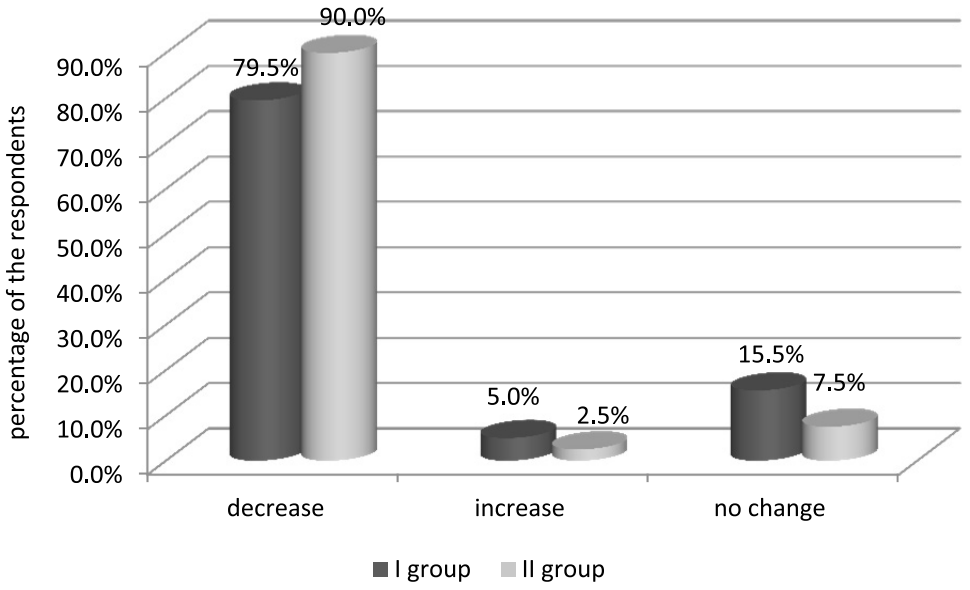

Figure 1. Change in the pain severity in the VAS scale

Table 1. Change in pain intensity in the VAS scale (n=79)

Group	Descriptive parameters					
	N	Me	Q1	Q2	Mean	SD
I group (mud, MF, kinesitherapy)	39	**–1.0**	–2.0	–0.5	–1.3	1.11
II group (MF, kinesitherapy)	40	**–1.0**	–2.0	–0.5	–1.3	1.43
Statistical significance	group I vs group II					p>0.05

In both groups, a statistically significant increase in the finger mobility test was also observed (p <0.05). In group I (pelotherapy, MF, kinesitherapy), the range increased from Me = -8.0 cm before the therapy to Me = -5.0 cm after the treatment. The mobility range increased in 24 respondents in this group (61%), decreased in 3 persons (8%), and in 12 (31%) remained unchanged. In group II (PM, kinesitherapy), the range of motion in the fingertip-to-floor test increased from Me = -9.0 cm to Me = -6.0 cm after the therapy. The increase in the range of motion was found in 27 patients (67.5%), in 6 respondents (15%) there was a decrease in mobility, and in 7 patients (17.5%) the mobility range remained unchanged. (figure 2). A more significant reduction in the level of the perceived pain was observed in group 2, in which the range was increased by Me = 2.0 cm, and in group I – by Me = 1.5 cm (Table 2).

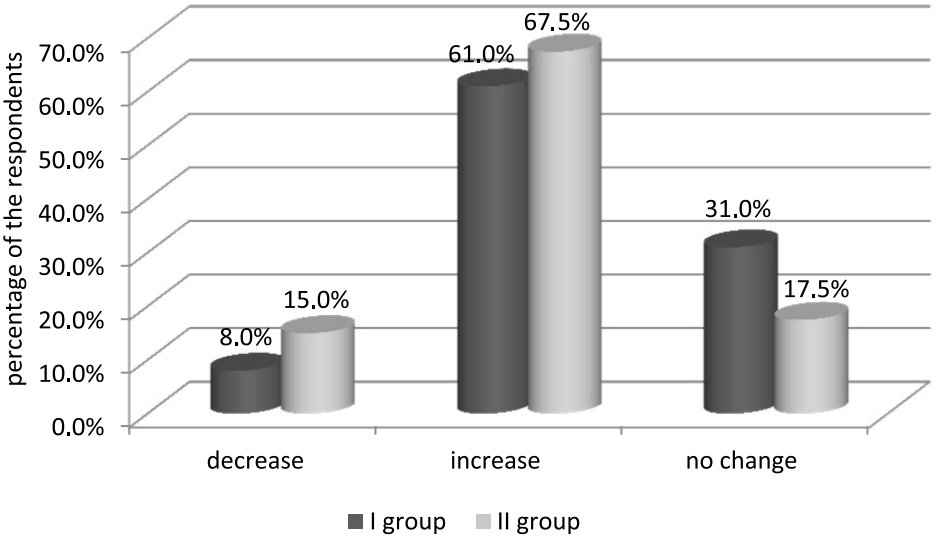

Figure 2. Change in the lumbar spine movement in the fingertip-to-floor test

Table 2. Change in the spine mobility in the fingers-to-floor test (n = 79)

Group	Descriptive parameters					
	N	Me	Q1	Q2	Mean	SD
I group (mud, MF, kinesitherapy)	39	**– 1.5**	–3.0	0.0	–1.9	3.13
II group (MF, kinesitherapy)	40	**–2.0**	–5.0	0.0	–2.8	5.38
Statistical significance	group I vs group II					p>0.05

In both groups, the change in the degree of disability measured by the Roland-Morris scale was statistically significant (p <0.05). In the first study group (pelotherapy, PM, kinesitherapy), the degree of disability decreased from Me = 6.0 points before the therapy to 4.0 points after the treatment. The degree of disability in 21 respondents (54%) in this group decreased, in 10 (26%) increased, whereas and in 8 persons (20%) there was no change. In the other study group (pelotherapy, kinesitherapy), the degree of disability decreased from Me = 6.5 points to 5 points after the treatment. Also, a reduced level of disability was found in 26 respondents (65%) in group II, there was an increase in the value of disability indicator in 9 individuals (22.5%), and in 5 persons (12.5%) it remained unchanged (figure 3). In both groups, the median change in the degree of disability by the Roland Morris scale was 1.0 point, which indicates that the difference between the groups was not statistically significant (p> 0.05) (Table 3).

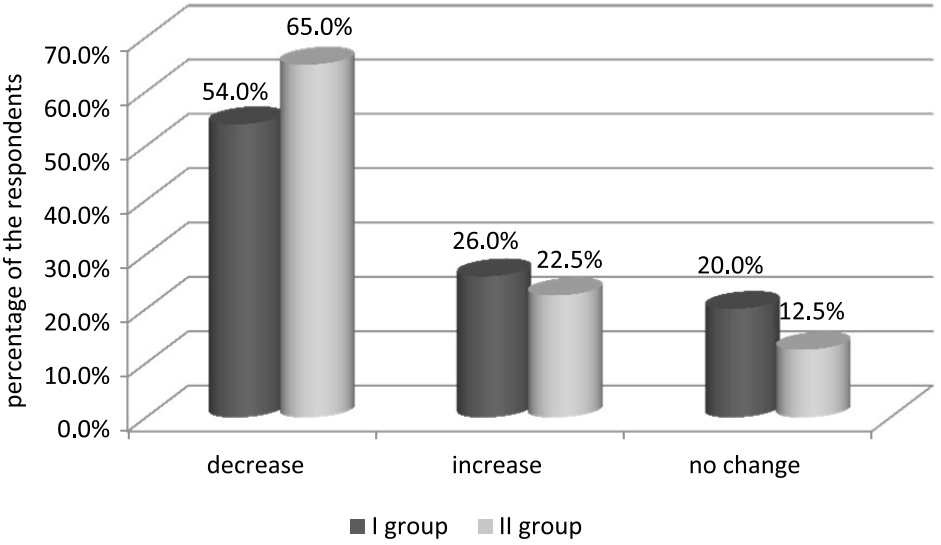

Figure 3. Change in the degree of disability in the Roland-Morris scale

Table 3. Change of the degree of disability by the Roland-Morris Questionnaire (n = 79)

Group	Descriptive parameters					
	N	Me	Q1	Q2	Mean	SD
group I (magnetic field, mud, kinesitherapy)	39	**–1.0**	–3.0	1.0	–0.9	3.13
group II (MF, kinesitherapy)	40	**–1.0**	–3,0	0.0	–1.0	2.66
Statistical significance	group I vs group II					p>0.05

Discussion

The therapy of combined physiotherapeutic treatments is often used to treat the symptoms of discopathy, due to the low cost of such treatment, as well as good short- and long-term results. As Komori et al. claim, about 80% of patients with discopathy can be successfully treated conservatively [8]. What our research confirmed was that pain could be significantly reduced, and one's flexibility and mobility improved

Many authors support the view that the combination of physiotherapeutic, kinesitherapeutic or balneological methods in treatment produces better results than when patients are treated with the exclusive use of one method [9,10,11,12]. A particular role in the treatment of discopathy is played by balneotherapy treatments, among which mud therapy is the most commonly used one. The healing properties of peat are primarily due to the presence of the composition of humic compounds. Colloidal properties of these acids cause that mud can keep heat for a long time, bind water, affect sorption and exchange capacities [13]. Thanks to these features mud therapy has anti-inflammatory, antibacterial and analgesic effects, reduces edema and provides better blood supply [14].

Due to its physicochemical properties, mud may affect thermal and chemical mediators, which makes the therapy more effective than regular thermal treatment. This property is confirmed by Sarsan et al., who compared the effectiveness of mud compresses and warm wraps in the treatment of osteoarthritis symptoms [15]. The studies showed that mud compresses proved to be more efficient in reducing pain or stiffness, improving functioning in daily life.

Also, Ponikowska et al. asserts the efficacy of mud therapy in patients with degenerative spine disease [14]. The study involved 30 patients who underwent iontophoresis and had mud-baths therapy with peat extract. The control group was treated using a placebo that would not differ in colour or smell from the peloid preparation. Patients from both groups also underwent kinesitherapy. Two series of 12-15 treatments were performed. In both groups, clinical improvement was found since the placebo treatment also had some therapeutic effects. However, in the study group, pain decreased by an average of 2.27 points on the VAS scale, and in the control one only by 1.72 points. The authors also noted a more significant improvement in the quality of life in patients in the study group. The remaining parameters which were examined (fingertip-to-floor test, stiffness, WOMAC test, Likert test, pain after walking) did not change statistically significantly in any of the studied groups.

Similar results were obtained by Mordak et al. [16], who assessed the impact of peat compresses on pain and mobility of the lower spine in the people with degenerative lumbar spine disease. As a result of 10 pelotherapeutic treatments, they achieved a reduction in pain at the VAS scale by 35% (average 0.7 degrees) and an increase in bending in 17% of the patients, in rotation in 30% of the respondents and range of the fingers-floor test in 37% of respondents.

Conclusions

The inclusion of a pelotherapy in the treatment of patients with discopathy treated with the use of low-frequency magnetic field and kinesitherapy did not significantly affect the patients' well-being and bring better therapeutic results.

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