

RESEARCH ARTICLE

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Osteopathic Treatment of Patients with Coxarthrosis: A Randomised Controlled Trial

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ABSTRACT

Background: The study aimed to deliver valid data for the short-term effect of osteopathic manual treatments for patients with advanced osteoarthritis of the hip.

Methods: For this prospective, randomised controlled trial patients diagnosed with coxarthrosis were randomly allocated to an intervention group and a control group. The patients in the intervention group received osteopathic treatment on three occasions for nine weeks. The control group did not receive any treatment. At the beginning and the end of the study, all patients had to specify their level of pain in general, whether they felt pain at walking, when climbing stairs and when lying. In addition, patients were questioned about restrictions in their daily activities.

Results: For the level of pain in general, the arithmetic mean of the intervention group (n = 15) decreased from 5.333 points (SD 1.589) at the start of the treatment (on a scale from 1 to 10) to 4.733 points (SD 1.534) at the end of the study. This represents a statistically significant change (p = 0.047). The other parameters improved for the patients who received osteopathic treatment, although they did not reach the level of significance. The control group (n = 15) had the same measurements from the beginning to the end of the study.

Conclusions: Only a small segment of the outcome reached statistical significance. Nevertheless, a beneficial impact of the osteopathic treatment for patients with coxarthrosis was observed. Further research should carefully consider the methods and design needed to reach statistically significant outcomes.

Keywords: arthritis, coxarthrosis, hip, OMT, osteoarthritis, osteopathy

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BACKGROUND

Osteoarthritis of the hip (coxarthrosis) is a chronic degeneration of the cartilage of the joints. The disease increases in prevalence with age. In Austria, more than a million people suffer from arthritis [1]. Pain is the main complaint for patients with coxarthrosis. In addition, these patients sometimes have difficulties coping with the demands of their everyday life. The high prevalence is even considered as a factor in national economics [2].

The damage to the joints cannot be cured, but the effects of pain and restriction of motion can be treated. At best, the progress of the disease can be delayed by therapeutic intervention. Eventually, a surgical procedure could provide relief for patients but with all the attendant risks of surgery involved.

Several studies have examined the effects of different treatment methods. Hence, it appears certain that movement therapy, Masai barefoot technology and acupuncture can ease the pain of patients with coxarthrosis [3–6]. Likewise, therapeutic exercise programmes can reduce pain and improve physical function among patients with symptomatic hip osteoarthritis [7].

The present study aimed to deliver valid data for the positive effect of osteopathic manual therapy for patients with coxarthrosis. The outcome supplements existing research papers in this field [8,9].

METHODS

This prospective, randomised, controlled trial was carried out to explore the effects of osteopathic therapy with regard to pain level in general, at walking, climbing stairs, and when lying. In addition, we examined the effects of therapy about patient limitations when doing domestic activities, getting out of bed, getting on and off the toilet and doing the shopping.

The study aimed to test the null hypothesis that for patients with osteoarthritis of the hip, osteopathy has no influence on the pain felt and their ability to function in daily life.

For this purpose, 36 patients were enrolled by an orthopaedic surgeon. The participants were required to have been diagnosed with osteoarthritis of the hip grade 2 or 3 using the Kellgren and Lawrence score [10]. Additional inclusion criteria were a minimum age of 50 years and a minimum of 4 points for indicated pain. The method of grading pain used in this study was a numerical value from 1 to 10 for the severity of the pain. The restrictions were graded in 5 steps from “none” to “extreme”. The WOMAC-osteoarthritis index and the HOOS-Score served as a template [11,12]. Both internationally recognised and validated questionnaires were adapted, simplified and reduced to 4 questions each. Also, basic data were collected such as age, sex and body mass index.

Fifty-two patients who met the inclusion criteria had a personal briefing. Finally, 36 patients signed the consent form, received a patient number and were equally allocated to an intervention group and a control group by using an online randomisation tool.

The questionnaires with basic data were completed by the participants at the beginning of the study, while the questionnaires regarding the parameters were completed at the beginning and end of the study.

The participants in the intervention group received osteopathic treatment by the author of the study. Each patient in this group received three individual manual osteopathic treatments (OMT) at intervals of 3 weeks. The interventions were conducted at the author’s private practice in Styria from May to December 2016. The patients in the control group did not receive any treatment (waiting group). Neither group was allowed to take pain-killers or any other kind of medical treatment during the whole study period. The participants of the control group were offered the same osteopathic procedures after completing their questionnaires following the nine weeks waiting period, that is, after the end of the study.

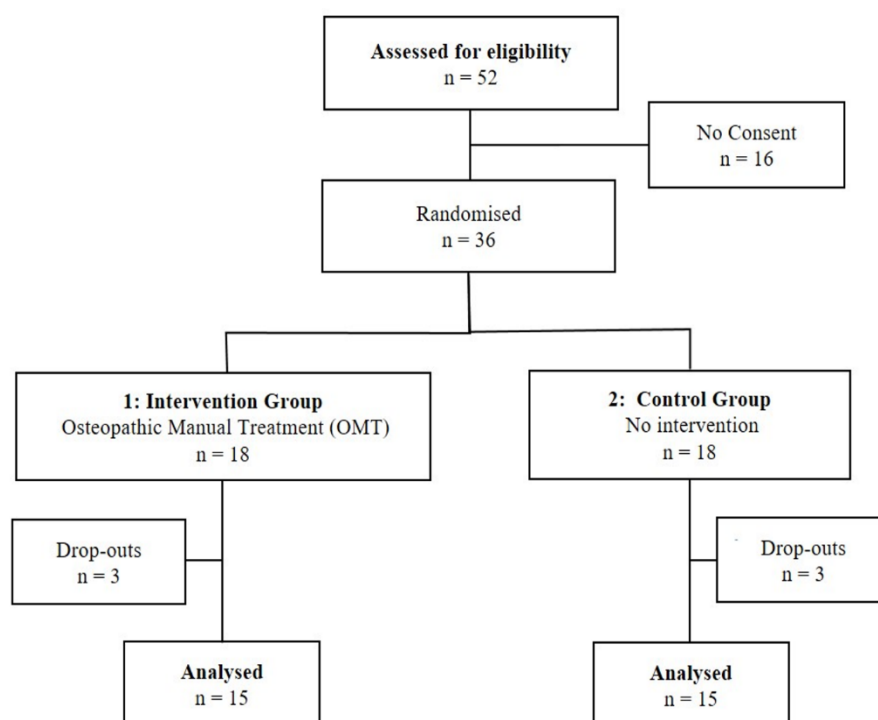


Figure 1: Participant flow

At the start and end of the study, all participants had to specify their sensation of pain (general feeling of pain, pain at walking, climbing stairs and when lying down) and their restrictions in function (when doing domestic duties, getting out of bed, getting on and off the toilet and doing the shopping).

Baseline characteristics of the patients entering the study were balanced between the two groups.

Of the 18 patients, three patients in the intervention group dropped out: one patient started a stay at a health resort, one patient had surgery, and another was sceptical about osteopathy. The control group was also reduced to 15 participants: 2 patients took pain killers during the study period, and one patient could not be reached for further appointments. Therefore, the data of 15 participants per group could be analysed.

Statistics

Subsequent to the descriptive statistics, the arithmetic mean was calculated for metric scaled characteristics. The normal distribution was

tested. To compare the groups, the t-test was used.

Analysis of variance was performed to test the differences of the means followed by post-hoc tests. The Wilcoxon signed-rank test was used for non-normal, dependent samples, and the Mann-Whitney U-test for independent samples. Differences in frequency were tested using Pearson's chi-square test.

Correlation analyses were used to find potential correlations. The significance level was set at 5%; that is, a p-value smaller than 0.05 was considered significant.

RESULTS

The study examined the changes of the primary and secondary parameters resulting from 3 osteopathic treatments for patients with coxarthrosis. Figure 1 shows the number of participants during the study phases. Tables 1 - 4 show the values for primary and secondary parameters at the start and end of the study.

Table 1: Statistical key values for the intervention group for primary parameters.

Time of measurement	Primary parameters	Mean	SD	Median	Min	Max
At the start of the study	General feeling of pain	5.333	1.589	5	4	9
	Pain at walking	5.067	1.486	5	3	9
	Pain when climbing stairs	5.733	1.870	5	3	10
	Pain when lying	4.133	1.407	4	2	8
At the end of the study	General feeling of pain	4.733	1.534	4	3	8
	Pain at walking	4.733	1.792	5	3	8
	Pain when climbing stairs	5.333	1.799	5	3	9
	Pain when lying	3.600	1.502	3	2	6

Table 2: Statistical key values for the control group for primary parameters.

Time of measurement	Primary parameters	Mean	SD	Median	Min.	Max.
At the start of the study	A general feeling of pain	5.200	1.424	5	4	8
	Pain at walking	4.867	1.642	4	2	9
	Pain when climbing stairs	5.600	1.454	5	4	9
	Pain when lying	4.600	1.454	4	2	8
At the end of the study	A general feeling of pain	5.267	1.580	5	3	8
	Pain at walking	5.000	1.464	4	4	9
	Pain when climbing stairs	5.600	1.454	5	4	9
	Pain when lying	4.533	1.407	4	3	8

Table 3: Statistical key figures for the intervention group for secondary parameters.

Time of measurement	Secondary parameters Limitations...	Mean value	SD	Median	Min	Max
At the start of the study	when doing domestic tasks	2.400	1.121	2	1	5
	when getting out of bed	3.000	1.000	3	2	5
	when getting on and off the toilet	2.800	1.082	2	2	5
	when doing the shopping	1.933	0.799	2	1	3
At the end of the study	when doing domestic tasks	2.067	0.799	2	1	4
	when getting out of bed	2.600	0.828	2	2	5
	when getting on and off toilet	2.533	0.834	2	2	5
	when doing the shopping	1.733	0.704	2	1	3

Table 4: Statistical key figures for the control group for secondary parameters.

Time of measurement	Secondary parameters Limitations...	Mean value	SD	Median	Min.	Max.
At the start of the study	when doing domestic duties	2.533	0.915	3	1	4
	when rising from bed	2.933	0.884	3	2	4
	when getting on and off toilet	2.733	0.884	2	2	4
	when doing the shopping	2.000	0.894	2	1	3
At the end of the study	when doing domestic duties	2.467	0.640	3	1	3
	when rising from bed	2.867	0.743	3	2	4
	when getting on and off toilet	2.800	0.676	3	2	4
	when doing the shopping	1.867	0.834	2	1	3

Taking the general feeling of pain as an example, the figures show that the arithmetic mean of the intervention group is 5.333 points (SD 1.589) at the start of the study and is similar to the average mean of the intervention group with 5.200 points (SD 1.424). At the end of the study, the mean

value decreases for the intervention group to 4.733 points (SD 1.534) and is nearly stable with 5.267 points (SD 1.580) for the control group (see also Figure 2). All other parameters show a comparable pattern.

Table 5 Comparison of the values at the start and the end of the study for all parameters. *: significant difference ($p < 0.05$).

Group	Parameters	Comparison start vs. end	
		Z-value (Wilcoxon-Test)	P-value (2-sided)
Control-Group	A general feeling of pain	-0.277	0.782
	Pain at walking	-1.000	0.317
	Pain when climbing stairs	0.000	1.000
	Pain when lying	-0.577	0.564
	Limitations when doing domestic tasks	-0.577	0.564
	Limitations when getting out of bed	-0.447	0.655
	Limitations when getting on and off the toilet	-0.447	0.655
	Limitations when doing the shopping	-0.577	0.564
Intervention-Group	A general feeling of pain	-1.983	0.047*
	Pain at walking	-1.184	0.236
	Pain when climbing stairs	-0.997	0.319
	Pain when lying	-1.890	0.059
	Limitations when doing domestic tasks	-1.890	0.059
	Limitations when getting out of bed	-1.897	0.058
	Limitations when getting on and off the toilet	-1.414	0.157
	Limitations when doing the shopping	-1.732	0.083

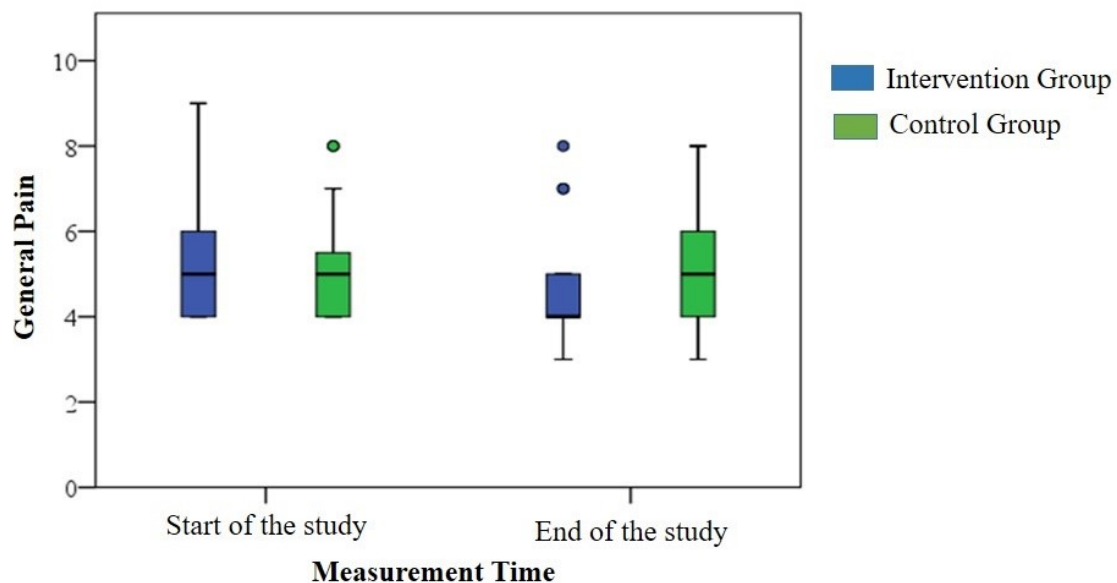


Figure 2: Boxplot: General level of pain for each group

Comparing the values at the start of the study with the values at the end of the study for each group shows a similar picture (see Table 5). Only one parameter reaches the level of significance. The value for the general level of pain decreases in the intervention group from a median of 5 to a median of 4 at the end of the study ($p = 0.047$). All other changes remain below the level of significance (< 0.05).

DISCUSSION

Interpretation of the results

The study aimed to answer the question whether three osteopathic treatments during nine weeks improve the general feeling of pain and the restrictions in daily activities for patients with coxarthrosis. The results indicate that from a statistical point of view, the research question is to be answered in the negative. The null hypothesis that osteopathy has no influence on patients with osteoarthritis of the hip with regard to the general feeling of pain and ability to function in daily activities cannot be rejected. Only a single

parameter out of 8 showed a statistical significance. Therefore, we cannot positively confirm the research question.

Nevertheless, the outcomes clearly show the tendency for osteopathic treatment to positively influence the quality of life for patients with coxarthrosis.

Somatic dysfunction and coxarthrosis

The participants of this trial suffered from a diagnosed coxarthrosis grade 2 or 3 and had an average age of 70 years. Osteoarthritis is a degenerative disease leading to progressive and irreparable damage of the hip joint [13–15]. Primary osteoarthritis is associated with ageing and has no known specific cause [16]. From an osteopathic point of view, a somatic dysfunction most probably influences and stimulates the destruction process of the cartilage. Therefore, especially for primary coxarthrosis, where no obvious cause for the disease can be identified, the most effective therapy would have been the preventive treatment of the so-called impaired or altered function of related components of the somatic (body framework) system which led to the damage [17]. Once the joint is in poor condition, osteopathic treatment is more or less restricted

to damage control. Hence, reliable statements about the positive effect of osteopathy are reported mainly for disorders that are not based on irreversible damage [18].

In a nutshell, coxarthrosis in an advanced stage does not represent an ideal basis to demonstrate the potential of osteopathic treatment.

Intersubjectivity

The author chose to treat each patient individually without a given defined and standardised procedure. This meets the requirements of osteopathic manual treatment (OMT), which is the therapeutic application of manually guided forces by an osteopath to improve physiological function and/or support homeostasis that has been altered by somatic dysfunction. Practitioners of OMT employ a variety of techniques [17]. The osteopath has to decide on a case-by-case basis on the suitable structural, visceral or cranial techniques to apply. Therefore, a particular osteopath might apply different techniques with possibly slightly different effects. This freedom of choice does compromise the quality criteria of intersubjectivity, and it cannot be guaranteed that another osteopath would obtain the same results.

Preceding studies

A comparable study examined the effect of 6 osteopathic treatments [8]. The outcome was altogether positive. However, upon closer examination, the participants do not have enough parallels to allow a serious comparison with our study. The age of the participants ranged from 20 to 50 years. The composition of the study population is questionable because primary coxarthrosis generally occurs at the age of 50 years or later [14]. The average age of the patients in our study is 70 years. With regard to these considerations, no further comparisons could be made.

A second study in this field examined whether the various forms of the complaints of coxarthrosis can be influenced by an osteopathic treatment [9]. After a waiting period of 6 weeks, 30 patients with diagnosed coxarthrosis in stage

1 or 2 were treated on four occasions. The results showed a very significant improvement of the values for pain, restrictions in daily life and quality of life. However, even without any treatment, an improvement was recorded immediately after the waiting period. In addition, the average age was 55 years and therefore, nearly 15 years below the average of this study. Moreover, the patients were enrolled at an earlier stage of the illness. As mentioned before, it seems to be easier to demonstrate a statistically significant effect for osteopathic treatment for an earlier stage of damage.

CONCLUSIONS

Summary

This study aimed to demonstrate that osteopathy could reduce pain and improve physical function among patients with coxarthrosis. This assumption could not be verified statistically. However, from a subjective point of view, the patients in the intervention group had less pain and better physical function by the end of the study.

Outlook

Considering the increasing prevalence of coxarthrosis and the impaired quality of life of patients with this disease, further studies should be conducted given the potential of osteopathic treatment.

Future examinations should emphasise preventive measures to gain the greatest effect. Solving somatic dysfunctions could have an impact on the time and intensity of disease occurrence. Accordingly, long-term studies would be very interesting.

Another aspect that seems to be of importance is the holistic approach of osteopathy. Osteopathic treatment can only trigger the healing process. The patient's attitude is crucial for the success of the therapy. The author is convinced that the positive effects would increase if participants enrolled were those who accepted responsibility for their healthcare and have a positive attitude. This factor should be considered for the selection criteria for future studies.

Discloser

The authors have no personal financial or institutional interest in any of the drugs, materials or devices described in this article.

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