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Effect of osteopathic manipulative treatment on pain in palliative care patients: a randomized placebo-controlled clinical trial

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Abstract

Introduction: Standard osteopathic manipulative therapy (OMT) is used as a supportive care for pain management in cancer patients.

Objectives: The present study aimed to compare the efficacy of OMT with that of a sham treatment to attenuate pain in cancer patients in a palliative care unit.

Methods: This randomized clinical trial was a simple blind, monocentric, placebo-controlled study. Seventy-five patients were randomly distributed between standard and sham OMT sessions at a 1:1 ratio, receiving standard or sham treatment every 2 days for the 7 days of the study. Patients were assessed using a self-administered visual analog scale (VAS)—ranging from 0 to 100, recorded in the morning and evening. They also completed the QLQ-C15-PAL quality-of-life questionnaire on the first and last day of the study. For participants with controlled analgesia pumps, the number of analgesic doses was recorded.

Results: The OMT group demonstrated a significant effect of days, circadian period, and group on VAS pain decrease ($P < 0.05$). The VAS pain score for the OMT group exhibited a notable decline from the third day (D3 PM) ($P = 0.03$) to D6 PM ($P = 1.28 \times 10^{-05}$) with 43.2% improvement by the conclusion of the study. On D6, the quality-of-life score exhibited a tendency towards improvement. Patients with analgesia pumps showed a 31.58% reduction in their demand for analgesics ($P = 0.016$). No significant results were observed between D0 and D3.

Conclusion: It is hypothesized that OMT could prove an efficacious method of pain management in cancer patients receiving palliative care, in addition to conventional cancer treatment.

Keywords: Palliative care, Osteopathic manipulative treatment, Nonpharmacological interventions, Pain, Cancer

1. Introduction

1.1. Context and objectives

Every year, around 20 million people receive palliative care in the last year of their lives.[26] According to the World Health Organization, cancer patients account for 34% of patients receiving palliative care.[26] Pain associated with cancer is one of the most common symptoms, often having a negative impact on patients' functional status and quality of life.[35]

Cancer-associated pain is one of the most important reasons that patients receive palliative care.[35] In cancer patients, the prevalence of pain is 39% after curative treatment and 55% during anticancer treatments.[6] Despite the progress made over the past 20 years to improve pain management in cancer patients, pain is difficult to control in half of all patients.[41]

In palliative care, pain management is traditionally based on painkiller drugs and analgesic chemotherapy and radiation therapy. More recently, various nonpharmacological

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interventions such as art therapy, hypnosis, and acupuncture have gained interest[38,48]: complementary and alternative medicine approaches are increasingly integrated in pain management for cancer patients.[4,18] The American Geriatrics Society now recommends using nonpharmacological methods in association with pharmacological methods for pain management to relieve persistent pain in elderly patients.[2] Among the nonpharmacological therapies available, osteopathic manipulative treatment (OMT) is increasingly part of pain management programs for cancer patients.[4,18,49]

OMT is a nonpharmacological manual medicine that relies on manual contact for diagnosis and treatment.[3] OMT considers the relationships between the body, mind, reason, health, and disease, emphasizing the structural and functional integrity of the body and the intrinsic tendency of the organism to self-heal.[5] The essential elements of osteopathic health care are based on mastering and understanding the interactions of 5 models (biomechanical, respiratory-circulatory, neurological, metabolic-energy, and behavioral models).[43] These osteopathic care models are investigated during the structural assessment of the patient to formulate the diagnosis, the management strategy, and determine the choice of manipulation techniques for treatment.[3] The purpose of the structural examination is to locate somatic dysfunction, defined as impaired function of the somatic system as well as their associated vascular, lymphatic, and neural elements. Somatic dysfunction can be characterized by positional asymmetry, limited ranges of movement, abnormalities in tissue texture, or tenderness.[1,43] There is a consensus on the somatic dysfunction model that is mainly found in the U.S. studies. However, the mechanisms underlying complex interventions, from the OMT, could be multifaceted and include various factors related to the intervention, the patient, the provider, and the environment.[7,19]

According to a model of the mechanisms behind manual therapy, Bialosky et al.[7] suggested that manual therapy may lead to neurophysiological responses resulting in pain inhibition and that a transient mechanical stimulus on the tissue produces a chain of neurophysiological effects. OMT may thus act through an anti-inflammatory and parasympathetic effect mediated by interoception.[13] In addition, a study on the management of patient population with low back pain using OMT reported a reduction in cytokine levels.[16] This reduction in cytokine level is also associated with a decrease in pain perception.[29] Moreover, Ruffini et al.[39] showed that the osteopathic approach produces an increase in parasympathetic tone leading to a trophotropic effect. The short-term neurobiological effects of OMT seem to have a peripheral parasympathetic anti-inflammatory effect.[13,16,29,39] Similarly, Cerritelli et al.[10] showed that OMT has a dual effect: a central effect in certain areas linked to the pain matrix and a peripheral effect, through a change in heart rate variability. These results, compared with advances in neurophysiology, neuroanatomy, and pharmacology, help to better understand and study the underlying mechanisms of cancer pain[37] as well as the influence of OMT on these neurophysiological mechanisms.

To our knowledge, only one qualitative study, based on interviews with 16 palliative care patients, has shown that OMT has beneficial health effects on patients with complex pathologies such as cancer.[46] A clinical trial performed on 23 patients hospitalized in a geriatric oncology unit showed encouraging improvement in quality of life despite a small sample size and the absence of randomization.[4] A case study of an elderly patient surviving gastric cancer illustrates how osteopathy can play a role in the supportive care of cancer patients after conventional treatment.[27] However, no randomized controlled clinical trials have been performed to demonstrate the effectiveness of OMT in reducing pain in elderly cancer patients undergoing palliative care.

Here, we test the effects of standard OMT as a pain management approach for cancer patients undergoing palliative care. The present randomized placebo-controlled clinical trial aims to assess the influence of OMT compared with a sham treatment on pain in cancer patients undergoing palliative care. This study could offer recommendations for nonpharmacological pain management, using OMT, associated with pharmacological methods in cancer patients under palliative care.

2. Methods

2.1. Study design

This study is a randomized controlled comparative monocentric trial after a single-blind methodology. Patient recruitment began on May 6, 2019 and ended on June 23, 2021. The study was paused from February 2020 to June 2020 during the height of the COVID-19 crisis. This study was approved by the Northwestern France research ethics committee in February 2019 and followed the recommendations of the CONSORT extension statement regarding nonpharmacological treatments.[8] None of the methods were modified during or after the trial. All data were recorded using a single-blind protocol.

2.2. Blinding

The osteopathic practitioner was not blinded, but the patients, the investigating doctors, the nurses, and the data analyst were blinded.[42] The objective was to blind all patients, health care professionals, and the data analyst, who were potential sources of bias.[34] It is generally necessary to blind the patients to obtain robust data.[34,42] Furthermore, the data analyst did not have access to or contact with the patients. However, osteopathy being a therapy that uses nonpharmacological physical manipulations, there is no way to blind the practitioner. The osteopathic practitioner was the only participant to know to which group the patients belonged. The patient's group was known to the practitioner after the patient was included in the study but not before the first treatment session. All OMT and sham manual treatment sessions were performed by the same practitioner throughout the study. Following Cerritelli et al., the sham group received a manual assessment and osteopathically inspired treatment, whereby the practitioner applies manual contact without using any specific technique, simply using a light static or dynamic touch. The practitioner is instructed to maintain and establish the same type of patient–practitioner relationship.[10] In this way, experimental and control interventions in efficacy and mechanistic trials should be "structurally equivalent" or "impossible to distinguish" according to Hohenschurz-Schmidt et al.[24] The intervention, treatment environment, and patient experience were set up to be as similar as possible. All OMT and sham treatments were performed by the same practitioner throughout the study. Blinding prevents trial participants from knowing which treatments they are receiving, ensuring that this knowledge does not influence their expectations of treatment benefit and does not bias trial results.[24] The osteopathic practitioner did not have access to the results before the last patient was included and unblinding did not occur before the last patient inclusion.

2.3. Setting and participants

The study was conducted with the mobile palliative care and support team (EMASP) from a tertiary care center in France. The

participants were recruited during a face-to-face interview with an investigator (medical doctor) specializing in pain medicine. Patients were either hospitalized for palliative care under EMASP care or attended the hospital on an outpatient basis for appointments and osteopathic sessions. Inclusion criteria were male or female adult (>18 years) patients who gave their informed consent to participate in the study and who had a moderate pain intensity score, based on the visual analogical scale (VAS), ie, between 40 and 70 of 100.[44]

Noninclusion criteria where patients who required adjustments in the type of painkiller as well as patients deemed unstable.

2.4. Size inclusion target

A preliminary study on 10 patients led to an estimate of the mean difference between the first and the second VAS measurement of 32 of 100 (SD, 13/100). The number of patients lost to follow-up was estimated at 20%. Obtaining a difference of 30% between the 2 groups, at a statistical power of 80% and an alpha risk of 5%, requires 28 patients in each group. Thus, to attain a minimum of 60 patients having received a complete treatment routine during the 7 days of study, 80 patients (40 per group) were enrolled.

2.5. Randomization and treatments

Randomization was stratified according to on-demand painkiller administration: patient-controlled analgesics (PCA). The patients were randomly assigned to groups according to a 1:1 ratio to receive the OMT therapy or a sham treatment. An independent statistician provided a randomization table, based on randomized permuted blocks (of variable size), to allocate the included patients.

At the beginning of potential patient enrollment, the investigator noted the baseline characteristics of the patient and obtained consent from each patient. After inclusion, the patient filled out a QLQ-C15-PAL questionnaire and provided their first VAS score, marking the beginning of the 7-day study. The QLQ-C15-PAL questionnaire is an abridged, 15-item version of the EORTC QLQ-C30 questionnaire quality of life developed for use in palliative care.[21] Thereafter, patients were randomly allocated to one of the 2 groups. The first OMT session was scheduled for D2 or D3 after inclusion. The treatment group underwent 2 OMT sessions, and the "placebo-controlled" group underwent 2 sham sessions. For both treatments, the second session took place after a 2-day interval. For the OMT and sham groups, each session lasted 45 minutes and was made up of 4 phases: (1) an interview focusing on the patient's pain (localization, chronology, triggering factors, intensity, associated signs, and factors that augment or reduce the pain); (2) a complete osteopathic examination; (3) standard or sham osteopathic manipulation; (4) final phase, the treated areas were tested again. In both groups, the practitioner assessed the dysfunction in 4 regions: the lumbar–pelvic region, the abdominal region, the thoracic region, and the cranial–sacral region and applied OMT or sham treatment to those considered dysfunctional. OMT treatment consisted mainly of indirect myofascial release, soft tissue pressure, and cranial and craniosacral techniques. No high-velocity or low-amplitude techniques were used because of the fragile and vulnerable nature of some patients.[33] In the sham treatment, the practitioner applied manual contact on the patient in the same tested areas, but with no healing intention, silently counting out the same manipulation times.[31] The care practitioner was an osteopathic therapist with specific, extensive experience in treating cancer patients in palliative care.

2.6. Primary and secondary endpoints and data recording

The VAS scores, the number of on-demand painkiller doses, and the data from the self-administered QLQ-C15-PAL questionnaire to assess the primary and secondary endpoints were collected during the face-to-face interviews.

A self-administered VAS score was the primary endpoint assessed to estimate the perception of pain. VAS scores were recorded each morning at 07:48 AM (mean) (SD, 00:30) and each evening at 07:40 PM (00:37). Each day, VAS scores were compared with respect to the respective D0 values.

The VAS score was plotted as a 100-mm line on paper, with 2 extremes ranging from 0 (no pain) to 100 (worst pain imaginable).[47]

The secondary endpoints were mean reduction with respect to the initial PCA dose, assessed using the number of self-administered painkiller doses, and the mean improvement in the initial quality-of-life score extracted from the self-administered QLQ-C15-PAL questionnaire on D0 and D6.[12,21]

No serious undesirable events leading to premature dropout from the study occurred during the study.

This study was registered with ClinicalTrials.gov, identification number: NTC03939377. The data supporting the results of this study are available on request from the corresponding author.

2.7. Statistical analyses

Patient baseline characteristics were analyzed according to treatment (patients randomly allocated to one or the other treatment). The categorical variables are expressed as frequencies and percentages.

The VAS variables and QLQ-C15-PAL scores are expressed as mean (SD). The number of delivered PCA doses is expressed as the median, with the interquartile range (IQR). Missing values for the VAS score, number of PCA doses, or the QLQ-C15-PAL score were replaced by the most favorable SD value for the sham treatment group and the least favorable for the OMT treatment group. Any potential bias would favor the absence of difference between the 2 groups. The sham treatment group had 3 missing values for the VAS score, and the OMT group had 1. For the number of PCA doses, there were 4 missing values in the sham group and 2 for the standard group. Finally, for the QLQ-C15-PAL score, one missing value was replaced with the mean in the standard treatment group.

The VAS results were analyzed longitudinally to study their change over time. Each series (ie, scores recorded on each half day) was tested for normality using the Shapiro–Wilk normality test. A repeated-measures analysis of variance (ANOVA) was used for the factors "time" (days) and "group" (sham vs OMT) and "circadian period" (AM vs PM). Pairwise differences were checked using the Scheffe post hoc test. The percentage (95% confidence interval [CI]) of score improvement was calculated and recorded.

Painkiller use (number of PCA doses) was collected and expressed as equivalent doses of oral morphine. These data were also analyzed longitudinally. Each series was tested for normality using the Shapiro–Wilk W test. These data were not normally distributed; therefore, a paired Wilcoxon test was used. The percentage (95% CI) of score improvement was calculated and recorded.

For the QLQ-C15-PAL questionnaire, results were summarized as scores. Each series was tested for normality using the Shapiro–Wilk normality test. Repeated-measures ANOVA was used for the factors "time" and "group"; pairwise differences were confirmed using the Scheffe post hoc test. The percentage (95% CI) of score improvement was calculated and recorded.

All the reported *P*-values are based on 2-tailed tests, and differences were considered significant at $P < 0.05$. All analyses were performed in MatLab, version 2022a.

3. Results

In this study, 80 patients were eligible, reporting VAS scores greater than 40 of 100 and less than 70 of 100; 79 patients were randomly allocated to OMT (n = 40) or to sham (n = 39) groups. After the random allocation of patients to treatment groups, 3 patients left the study. Ultimately, 37 patients from the OMT group and 38 from the sham group were included in the study (**Fig. 1**).

Table 1 summarizes the baseline characteristics of the patients in the OMT and sham groups. No significant differences were observed in the characteristics of the 2 groups ($P > 0.07$). Most of the patients were hospitalized, and the different types of cancer were similarly represented. Finally, most patients (69%) showed pain associated with the cancer.

3.1. Primary endpoint

The principal findings of the VAS score analysis conducted on 75 patients indicate a notable reduction in pain levels among those who received OMT, as compared with the sham group ($P = 0.001$; size effect: $\eta^2 = 0.13$). The VAS scores demonstrate a statistically significant interaction between the variables of "time" and "group" on the reduction of pain ($P < 1 \times 10^{-06}$; size effect: $\eta^2 = 0.17$). The VAS scores indicate a significant interaction effect of "circadian period" and "group" on pain decrease ($P = 0.01$; size effect: $\eta^2 = 0.08$).

The results of the analysis of the VAS scores indicate a nonsignificant change for the sham group for morning (AM) and evening (PM) measurements between day 0 (D0) and the following days (D1–D6), whereas the OMT group demonstrated a significant decrease in its mean VAS score between D0 and D3, D4, D5, and D6. **Table 2** summarizes these results.

The mean (SD) AM VAS scores for the OMT group were 50.16 (5.99) on D0 and 29.57 (11.27) on D6 (**Table 2**), giving a decrease in pain score between D0 and D6 of −41.05% in the OMT group. The mean (SD) VAS AM scores in the sham group were 50.39 (6.08) on D0 and 43.16 (10.06) on D6, resulting in a decrease in the pain score between D0 and D6 of only −14.35% in the sham group (**Table 2**). Repeated-measures ANOVA showed a significant time × group interaction between the VAS scores of the sham and OMT groups ($P < 0.05$), with lower scores in the OMT group, for D0 and D3 AM to D0 and D6 AM. These results were confirmed with the post hoc Scheffe test ($P < 0.05$) for D0 and D5 AM and D0 and D6 AM (**Table 2**).

The mean (SD) PM VAS scores for the OMT group were 49 (5.43) on D0 and 27.84 (13.38) on D6 (**Table 2**), giving a decrease

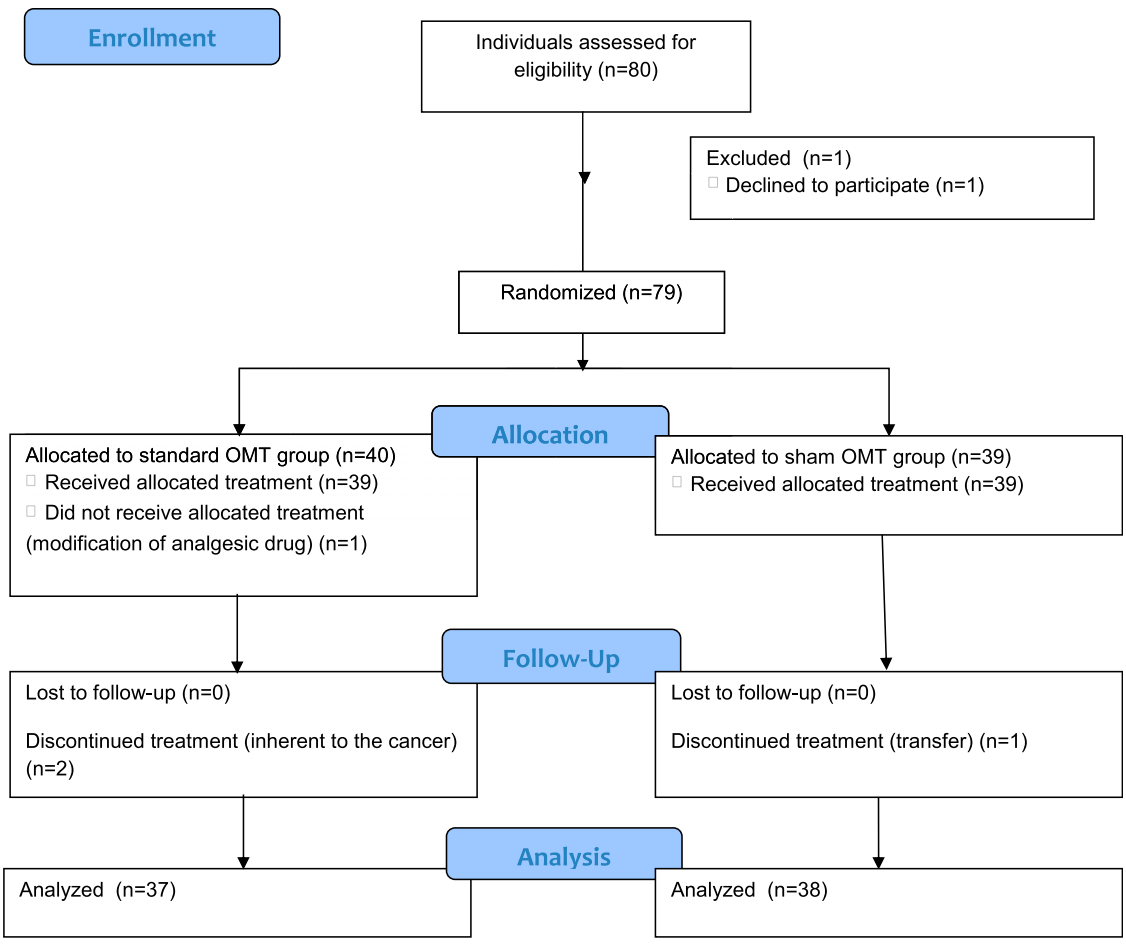

Figure 1. Flow diagram of the study. OMT, osteopathic manipulative treatment.

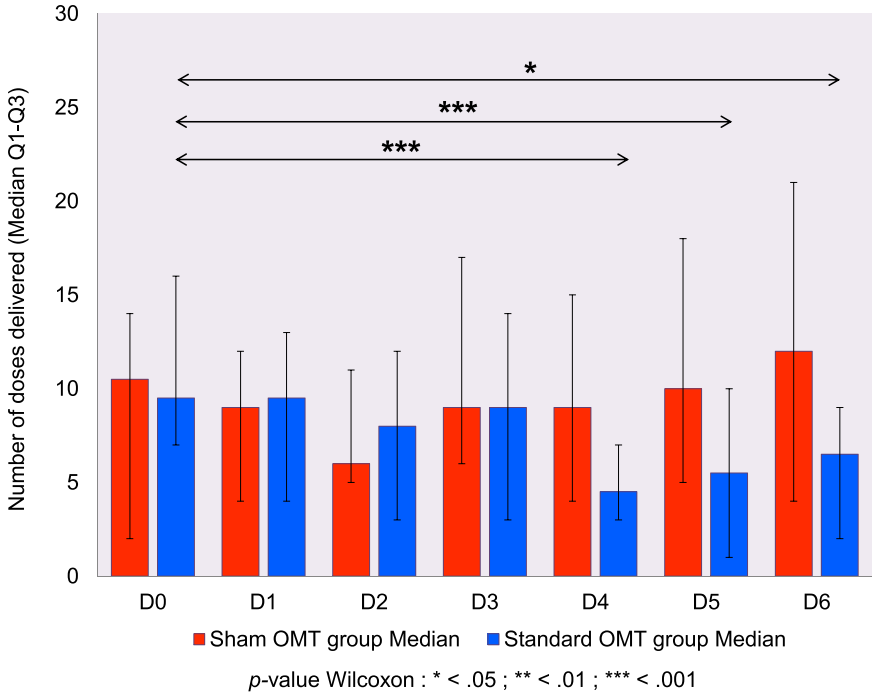

Figure 2. Change over time in the number of patient-controlled analgesic (PCA) doses delivered by day of treatment (D), for the standard osteopathic manipulative treatment (OMT) group (blue) and the sham group (red). *$P < 0.05$, **$P < 0.01$, ***$P < 0.001$.

in the pain score between D0 and D6 of −43.2% in the OMT group. The mean (SD) PM VAS scores in the sham group were 49.24 (5.74) on D0 and 43.21 (10.26) on D6, resulting in a decrease in pain score between D0 and D6 of −12.25% in the sham group. Repeated-measures ANOVA showed a significant time × group interaction of the VAS scores between sham and OMT groups ($P < 0.05$), with lower pain scores in the OMT group than in the sham group for comparisons of D0 and D3 PM,

Table 1

Baseline characteristics of the patients included in the study and comparison by treatment (standard osteopathic manipulative treatment [OMT] or sham treatment).

Characteristics	No. of participants (%)			
	Total (N = 75)	Sham OMT group (n = 38)	Standard OMT group (n = 37)	*P*
Sex, n (%)				
Women	40 (53)	21 (55)	19 (51)	0.82
Men	35 (47)	17 (45)	18 (49)	0.82
Age, mean (SD), y	63 (12)	64 (14)	62 (10)	0.47
Hospitalized patients, n (%)	64 (85)	31 (82)	33 (89)	0.52
Cancer, n (%)				
Lung	36 (48)	18 (47)	18 (49)	1
Breast	14 (19)	8 (21)	6 (16)	0.77
Digestive	13 (17)	9 (24)	4 (11)	0.22
Genitourinary	6 (8)	4 (11)	2 (5)	0.67
ENT	8 (11)	2 (5)	6 (16)	0.15
Other	3 (4)	0 (0)	3 (8)	0.12
Presence of metastasis, n (%)	44 (59)	24 (63)	20 (54)	0.64
Bone	32 (43)	18 (47)	14 (38)	0.49
Pulmonary	16 (21)	10 (26)	6 (16)	0.4
Digestive	8 (11)	6 (16)	2 (5)	0.26
Brain	13 (17)	10 (26)	3 (8)	0.065
Pelvic	3 (4)	3 (8)	0 (0)	0.24
Other	8 (11)	3 (8)	5 (14)	0.48
Chemotherapy, n (%)	51 (68)	25 (66)	26 (70)	0.81
Participants with PCA, n (%)	28 (37)	14 (37)	14 (38)	1
Localization of pain, n (%)				
Pain associated to cancer	52 (69)	28 (74)	24 (65)	0.46
Pain indirectly associated	31 (41)	15 (39)	16 (43)	0.82

P-value of comparison between the sham and OMT groups.
P-value was computed using T test.
ENT, ear, nose and throat; PCA, patient-controlled analgesics.

Table 2

Change in the morning and evening rated visual analog scale (VAS) pain intensity score by day of treatment (D), for the sham and the standard osteopathic manipulative treatment (OMT) groups.

Days	Circadian period	VAS				*P*	
		OMT sham (n = 38)		OMT stand. (n = 37)		rANOVA	Post hoc Scheffé
		Moy	SD	Moy	SD		
D0	AM	50.39	6.08	50.16	5.99		
D1	AM	48	9.07	47.38	7.65		
D2	AM	46	7.66	46.68	10.25		
D3	AM	46.71	7.89	41.59	10.64	**0.032***	0.065
D4	AM	44.08	10.90	37.95	14.09	**0.047†**	0.073
D5	AM	43.84	8.55	35.27	14.63	**0.002‡**	**0.014**
D6	AM	43.16	10.06	29.57	11.27	**6e-07§**	**4.31e-05**
D0	PM	49.24	5.74	49	5.43		
D1	PM	45.71	7.24	46.19	7.84		
D2	PM	45.42	8.81	43.05	10.49		
D3	PM	44.79	8.77	38.19	11.02	**0.003***	**0.03**
D4	PM	43.08	9.96	35.41	13.82	**0.038†**	**0.028**
D5	PM	44.13	10.8	30.59	14.25	**1.1e-05‡**	**0.0002**
D6	PM	43.21	10.26	27.84	13.38	**3.6e-07§**	**1.28e-05**

* *P* for difference between D3 and corresponding D0.
† *P* for difference between D4 and corresponding D0.
‡ *P* for difference between D5 and corresponding D0.
§ *P* for difference between D6 and corresponding D0.
rANOVA, repeated-measures analysis of variance.
Bold entries denote that the P-values are less than 0.05 ($P < 0.05$).

D0 and D4 PM, D0 and D5 PM, and D0 and D6 PM. These results were confirmed with a Scheffe post hoc test ($P < 0.05$) (**Table 2**).

3.2. Secondary endpoints (repeated-measures analysis of variances)

The mean (SD) QLQ-C15-PAL score for the OMT group was 41.95 (6.88) on D0 and 37.33 (6.88) on D6. The mean score of the sham treatment group was 40.68 (5.39) on D0 and 39.11 (6.29) on D6. The difference in improvement in these quality-of-life scores between the OMT and sham treatment groups was significant (repeated-measures ANOVA, day × treatment interaction, $P = 4.7 \times 10^{-05}$) but not confirmed by the Scheffe post hoc test ($P = 0.85$).

The median number of PCA doses was 9.5 (9) for the OMT group on D0 and 6.5 (7) on D6, and 10.5 (12) on D0 and 12 (17) on D6 for the sham treatment group (**Fig. 2**). The number of PCA doses delivered between D0 and D6 for the OMT group showed a significant decrease, dropping by −31.58% ($P = 0.016$).

No serious undesirable effects or incidents occurred during the study.

4. Discussion

The population described in this study showed inclusion characteristics similar to those in the study by Pilz et al.[36] on palliative care, in mean patient age and for the types of cancer (lung, breast, colorectal, prostate, and other). Our inclusion profile thus seems to be representative of hospitalized palliative care patients in Europe.

The main results of the present study showed concomitant, significantly decreased VAS pain scores on D3, and fewer PCA doses and increased quality-of-life scores on D6 associated with the OMT treatment. The patient effect appeared immediately after the first OMT (on D2) treatment compared with the sham group (D3). The effect of OMT treatment persisted through to D6.

Between D0 and D2, no significant differences were observed between the sham and OMT groups for any of the variables (VAS, quality of life, and PCA dose). During the first 2 days, the present study showed a low reduction in perceived pain, in line with previous study.[43] A nonsignificant trend for a daily decrease in the mean VAS score was observed in the sham and the OMT groups, with VAS scores remaining higher than 40 of 100.[44] The results of the present study are comparable with others, in which mean pain intensity decreased for all types of pain (nociceptive and neuropathic/mixed pain).[32] The daily VAS score in the sham and OMT groups seemed to be lower in the evening than in the morning. These results reflect those of a previous study reporting variation in perceived pain over the course of a day in terminal cancer patients with severe chronic pain and treated with major opioids.[40] This variation can be explained by the influence of time-specific circadian rhythms that are directly related to the rhythmicity of other homeostatic systems, such as the autonomic nervous system.[14]

The present study showed a significant decrease in the mean VAS score reported in the OMT group compared with the sham treatment group as of the third day (D3) of the study (reduction in pain greater than −40%). The OMT treatment performed on D2 and D3 included manual techniques that may have influenced heart rate variability and blood pressure.[17,39,50] Like other manual therapies, OMT treatment can affect heart rate variability, which is associated with decrease in pain.[51] The OMT treatment may have beneficial effects on the autonomic nervous system by contributing to the regulation of circadian rhythms.[14] The daily VAS score in the OMT group of the present study was consistently and significantly lower in the evening than in the morning. The OMT treatment seems to promote pain reduction through the regulation of specific circadian rhythms associated with homeostatic systems.[14,40]

The present study showed a significant decrease in the VAS score in the OMT group on D3 and up until D6 compared with the sham group. This result corroborates a previous nonrandomized study that showed a significant decrease in pain and trends of improving quality of life in oncological geriatric patients.[4] The present study also showed results similar to other studies that have shown reduction in other types of chronic pain in various clinical conditions.[20,30]

The results of the present study also identified a significant improvement in the quality-of-life (QLQ-C15-Pal) score in the OMT group, albeit not confirmed by the Scheffe post hoc test. Similar trends have been observed in study on a heterogenous group of hospitalized cancer patients.[4] The trend of improvement in quality of life and pain is also highlighted in another study that explored the experience of cancer patients receiving osteopathic treatment.[46]

The PCA patients showed a significant decrease in the number of self-administered painkiller doses as of D3 and up until D6, with a decrease of −32%. This reduction in analgesic doses, which coincides with the reduction in pain, is also observed in the study by Licciardone and Gatchel or osteopaths who use OMT report less frequent use of nonsteroidal anti-inflammatory drugs or opioids in their patients.[28]

The data from the study are in line with the results of previous studies confirming the efficacy of OMT in the management of chronic pain. OMT demonstrated a significant benefit in pain intensity, health-related quality of life, and medication consumption.[10] Numerous clinical studies confirm the anti-inflammatory effect of OMT and support the results of the study. Mechanistically, pain reduction may potentially be attributed to an increase in parasympathetic activity leading to a trophotropic effect.[22,39] Pain reduction may also be associated with a decrease in several cytokines,[9,11,23,45] particularly substance P.[29] Other studies have suggested that stretching effects oxidative stress, extracellular matrix remodeling, and their anti-inflammatory and anticancer properties.[25] These mechanisms were corroborated in a study on pancreatic cancer survivors, where the decrease in C-reactive protein levels is inversely correlated with increased vagal nerve activity.[15]

The main limitation of the present study was the population recruitment in one single pain management center and the use of only one osteopathic practitioner to treat the patients. Our promising results call for further investigations using other implementation settings and practices to validate the deployment of standard osteopathic treatment in cancer patients undergoing in palliative care in France. Because cultural representations of manual therapies may be country-dependent, the results of the present study probability cannot be extended to another culture or context, which limits the transferability of our results. Additional studies on the relationship between manual therapies and homeostatic systems associated with pain should lead to a better understanding of the mechanisms of nonpharmacological interventions. Further research is needed to confirm our results and determine the best indications for osteopathic treatment in palliative medicine.

5. Conclusion

In this randomized placebo-controlled clinical trial on cancer patients undergoing palliative care, OMT had a significant effect on pain improvement as early as the first OMT intervention. These results were associated with a trend of improvement in the quality of life for the treated patients as well as a significant decrease in the number of PCA doses between the beginning and the end of the study. This study demonstrated that OMT is an effective pain management method for cancer patients undergoing palliative care. In addition to the usual anticancer treatment, OMT fosters reduction in pain as well as the demand for painkiller drugs. This study thus suggests that nonpharmacological interventions such as OMT, in conjunction with pharmacological methods for pain management, can provide better relief of persistent pain for cancer patients under palliative care.

Disclosures

The authors have no conflicts of interest to declare.

However, in compliance with the specific request of a reviewer, the authors declare that they may hold interests in: the Creteil hospital to improve palliative care, the University to increase the number of scientific communications to improve its international ranking, the Ecole Supérieure d'Ostéopathie to promote osteopathic manual therapies, and the patients to improve their health.

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