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Hip Pain is Reduced Following Moderate Pressure Massage Therapy

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Abstract

Background: The literature on massage therapy effects on pain suggests that it has been reduced in several joints. However, no studies were found on massage therapy for hip pain.

Methods: Medical school staff and faculty who had hip pain were randomly assigned to a moderate pressure massage therapy or a waitlist control group. Twenty-minute massages were given weekly for a month. Self-reports including the WOMAC (pain, stiffness and function) and the PROMIS (scales on mood, sleep and daily functioning) were given on the first and last days of the treatment period and at a follow-up day one month later. Pain was assessed for external rotation, internal rotation, sitting, standing and bending before and after the first and last day massage sessions.

Results: The massage group experienced an immediate post-massage decrease in pain on all measures. On the last versus the first day of the study, the massage group reported greater decreases in pain on all measures as well as less self-reported sleep disturbances than the waitlist control group. The effects were sustained at the one-month follow-up period.

Discussion: These data highlight the effectiveness of moderate pressure massage therapy for decreasing hip pain and sleep disturbances.

Keywords: Hip pain; Moderate pressure massage

Introduction

The Center for Disease Control has recently reported that approximately seven per cent of U.S. adults experience hip pain. A few recent reviews have reported mixed findings on complementary therapies for pain including manual therapy and exercise therapy [1-3]. Unfortunately, no literature could be found on massage therapy for hip pain. However, several studies on knee pain have documented decreased pain [4-7] following massage. In a recent knee pain study, for example, moderate pressure massage led to an immediate decrease in Range of Motion (ROM)-associated pain [8]. On the last versus the first day of the study, the moderate pressure massage group showed greater decreases in ROM-related pain as well as less self-reported pain intensity and sleep disturbances than the waitlist control group.

Moderate pressure massage was used in that knee pain study [8] since moderate pressure has been noted to be more effective than light pressure massage in previous studies on adults with hand pain [9], upper arm and shoulder pain [10] and neck pain [11]. For example, in the study on individuals with upper limb pain, half the sample received moderate pressure massage (moving the skin) and the other half received light pressure massage [10]. The moderate pressure massage group versus the light pressure massage group had less pain and greater grip strength immediately following the first and last sessions. And, they also had less pain and greater grip strength than the light pressure group by the end of the four-week treatment period.

Because no studies could be found on massage effects on hip pain, the aim of this study was to fill that gap. The moderate pressure massage that was noted to have positive effects in recent studies on other joint pain was used and the massage was focused on the muscles and tendons surrounding the hip and knee.

Methods

Participants

A power analysis suggested that we needed 18 participants per group for 80% power at p=.05. To account for potential attrition (approximately 20% in our previous studies), and following informed consent, 54 adults were recruited. The participants were medical school staff/faculty with hip pain. Exclusion criteria were a history of hip surgery within the last two years and any joint replacement. The participants were randomly assigned to the massage or waitlist control groups (N=24 per group). After attrition the sample size was reduced to 40 participants (N=23 in the massage group and 17 in the waitlist control group) (Figure 1). The participants were adults (74% female), who averaged 49 years of age, were middle income and were distributed 22% Hispanic, 63% Non-Hispanic White and 15% Black. Their education distribution was 60% high school diploma, 27% college degree and 13% graduate degree. The two groups did not differ on these variables.

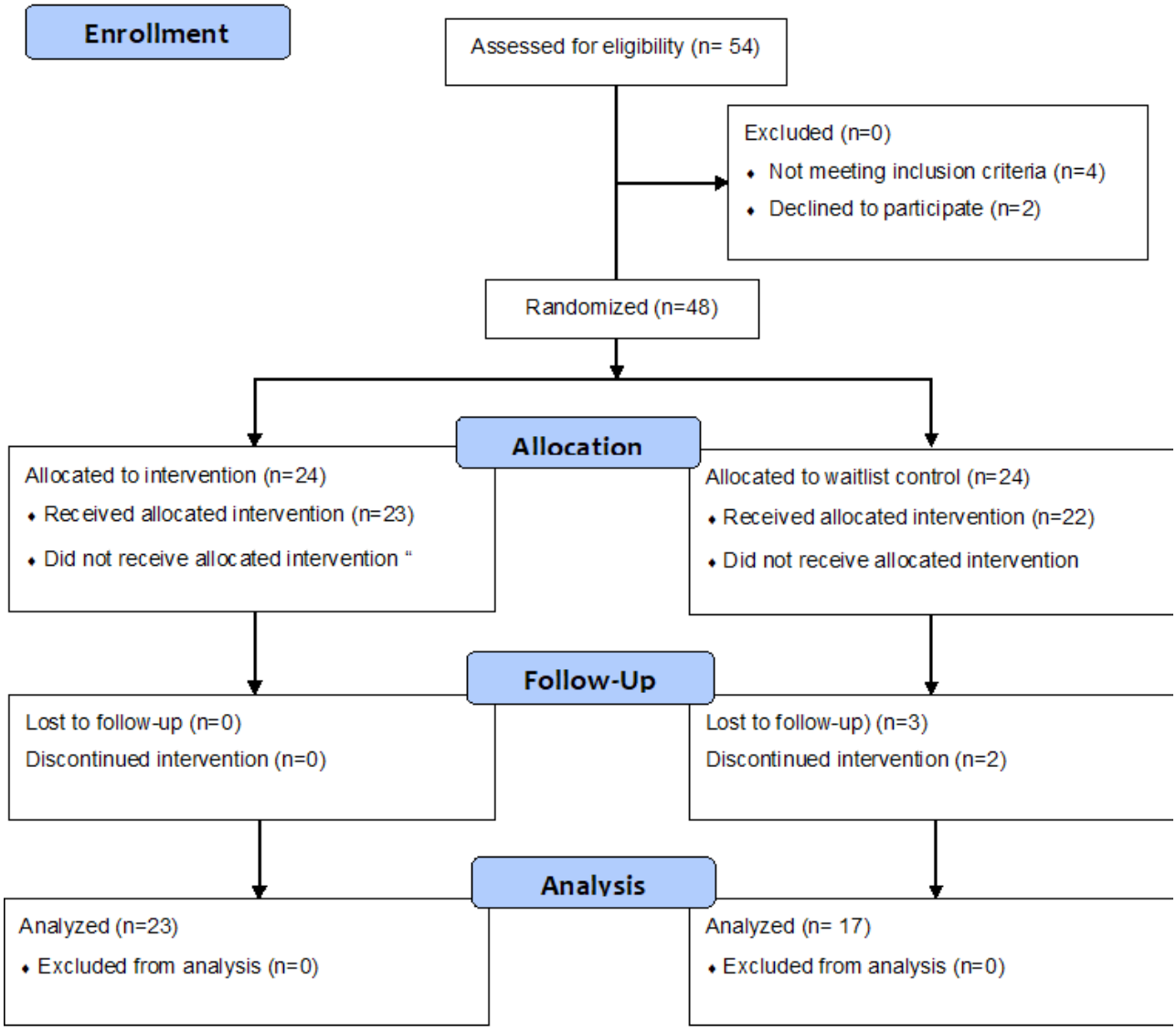

Figure 1: CONSORT Flow Diagram.

Procedure

The participants in the massage group were massaged by a licensed massage therapist once per week for a 4-week period. The 20-minute massages consisted of moderate pressure stroking (defined as observably moving the skin) focused on the quadriceps, the hamstrings and the tendons and ligaments surrounding the hip and the knee. The massage protocol was designed by the third author (GG, a licensed massage therapist) (Table 1). The participants in the waitlist control group were assessed on the first day and last day of the first month and then were given the same moderate pressure massages on the same schedule as the massage group during the second month.

PRONE	1. Jostle and tapotement of glutes, hamstrings and calf muscles 2. Myofascial on quadratus lumborum and gluteus maximus. 3. Stretch the hip joint by having the participant raise foot up into an L-shape, with knee flat on the table. Gently rotate the lower leg in each direction while you have your hand on the back of knee and the other on ankle. 4. Stretch at greater trochanter or sacrum. Apply pressure with open hand or fist.
SUPINE	1. Palm press over quads starting above patella tendon 2. Jostle and tapotement on Quads about 20 seconds 3. Above Patella: Thumb over thumb stripping tendon 4. Below Patella: Thumb over thumb stripping tendon 5. Lateral to medial glide across tendon above patella with thumb 6. Lateral to medial glide across tendon below patella 7. Medial to lateral racking of tendon above patella with fingers 8. Medial to lateral racking of tendon below patella with fingers 9. Friction lateral and medial ligaments of the knee starting at head of fibula 10. Strip lateral and medial ligaments of the knee at same time starting at head of Fibula 11. Slowly and firmly massage quads 12. Slowly massage iliotibial band starting at the head of the Fibula 13. Place leg over your shoulder and have participant bend and extend leg as you work slowly down the hamstrings with both hands 14. Have participant raise both knees and cross one leg over the other. The opposite foot lays flat on the table as you gently stretch hips. Return to original position.

Table 1: HIP MASSAGE: 20 minutes. For this treatment participant will be in Supine and Prone positions. Pressure will be moderate and the pace will be slow. Use very little lubricant. Perform each step 3X.

Assessments

The participants completed assessments before and after the massage sessions on the first and last days of the 4-week study period and at the follow-up session one month later. The waitlist control group was assessed on the first and last days of the 4-week period. Two self-report measures were given just prior to the sessions on the first, last and follow-up days of the study including: 1) The Western Ontario and McMaster's Osteoarthritis Index (WOMAC) questionnaire that consists of 5 items on pain, 2 items on stiffness, and 16 items on physical functioning [11]. Each of these items are scored 0-4 from no pain to extreme pain such that lower scores are optimal. This assessment has good reliability and validity [12]; and 2) the PROMIS-57 Profile that includes sub-scales on physical function, anxiety, depression, fatigue, sleep disturbance, ability to participate in social roles and activities, pain interference and pain intensity and also has good reliability and validity [13]. Each of these items are scored 0-5 with higher scores being optimal. The participants were then observed prior to and post the sessions for pain during different activities including:1) external rotation of the hips; 2) internal rotation of the hips; 3) lowering from standing to sitting; 4) standing from a seated position; and 5) bending over. These pain measures were rated on visual analogue scales from 0 pain to severe pain on 10-point scales.

Data Analyses

Repeated measures analyses of variance (ANOVAS) were performed (using SPSS) as follows with: 1) the pre versus the post measures from the first and last days for the massage group as the repeated measure; 2) the massage versus the waitlist control group as the between groups measure and the pre-session measures from the first and last day as the repeated measure: and 3) repeated measures ANOVAs on the pre-session measures from the last and the follow-up days for the massage group. The ANOVAS were followed by Bonferroni t tests for multiple pairwise-comparisons.

Results

As can be seen in Table 2, repeated measures ANOVAS on the pre-post measures for the first and last day suggested significant decreases for all the pain measures following the massage sessions. As can be seen in Table 3, repeated measures by group interaction effects for the group comparisons on the last day versus the first day measures revealed that; 1) the WOMAC hip pain, hip function and hip total scores decreased for the massage group and increased for the waitlist group; 2) the PROMIS sleep scores decreased for the massage group and increased for the waitlist group; 3) the PROMIS pain intensity scores decreased for the massage group and increased for the waitlist group; 4) the external rotation pain ratings decreased for the massage group and increased for the waitlist group; 5)the internal rotation pain ratings decreased for the massage group and increased for the waitlist group; and 6) the sitting, standing and bending pain scores decreased for the massage group and remained the same for the waitlist group. The repeated measures ANOVAs comparing the last day with the follow-up day measures for the massage group yielded no significant changes between the measures from the last day to the follow-up day one month later (Table 4). These findings suggest that the massage therapy effects were sustained for at least the one-month follow-up period.

Measure	First Day		Last Day		F	p
	Pre	Post	Pre	Post		
External Rotation Pain	2.83	1.58	1.50	1.19	4.58	0.05
Internal Rotation Pain	3.15	1.31	1.94	1.12	4.91	0.05
Sitting Pain	2.51	0.88	1.60	0.81	5.12	0.05
Standing Pain	2.56	0.81	1.80	0.73	4.73	0.05
Bending Pain	3.31	1.69	2.52	1.12	4.31	0.05

Table 2: Means for pre-post pain measures on first and last days for massage group.

	Group					
	Massage		Waitlist			
Measure	First Day	Last Day	First Day	Last Day	F	p
WOMAC Pain	8.00	6.17	8.10	9.33	4.15	0.05
WOMAC Function	29.17	18.08	21.67	28.83	4.53	0.05
WOMAC Total	42.17	27.33	32.50	42.00	4.40	0.05
Sleep	16.08	10.75	12.33	16.67	4.58	0.05
Pain Intensity	5.50	3.83	4.17	5.55	5.32	0.05
External Rotation Pain	2.83	1.50	2.17	3.50	4.58	0.05
Internal Rotation Pain	3.15	1.94	3.21	4.11	4.83	0.05
Sitting Pain	2.51	1.60	2.50	2.58	4.16	0.05
Stand Pain	2.56	1.80	2.75	2.25	4.08	0.05
Bend Pain	3.31	2.52	3.37	3.39	6.12	0.02

Table 3: Means for measures for first day and last day for massage and waitlist control groups.

Measure	Last Day	Follow-up Day
WOMAC Pain	6.17	7.10
WOMAC Function	18.08	22.16
WOMAC Total	27.33	31.52
Sleep	10.75	10.83
Pain Intensity	3.83	3.52
External Rotation Pain	1.50	1.84
Internal Rotation Pain	1.94	1.98
Sitting Pain	1.60	1.73
Stand Pain	1.80	1.91
Bend Pain	2.52	2.73

Table 4: Means for the last day and follow-up day measures for the massage group (all comparisons non-significant).

Discussion

The immediate and long-term positive effects of moderate pressure massage therapy on hip pain in this study are consistent with those previously reported decreases in pain following moderate pressure massage for pain in the upper limbs [7], in the neck [8] and in the knee [9]. As noted in previous research, moderate pressure is essential for positive effects [6].

The underlying mechanism for the relief of hip pain is not clear. A potential underlying mechanism is related to the finding that moderate pressure massage is accompanied by decreased heartrate, suggesting a relaxed state [14]. Stimulation of pressure receptors and the resulting increase in vagal activity and serotonin levels (the body's natural pain suppressor) is one potential underlying mechanism for pain relief [14]. A related mechanism for the pain decrease following moderate pressure massage is the reduction in substance P (substance P causing pain) [14]. Decreased substance P has followed moderate pressure massage and has been associated with increased deep sleep in an earlier pain study [15]. The improved sleep scores in this hip study are consistent with those noted in the earlier pain study [15]. Further research is needed to explore the potential underlying mechanisms for the relief of hip pain and other pain syndromes following massage therapy. In addition, this protocol needs to be replicated on a more representative sample than the medical school employees sampled here, which is a limitation of this study [16-19].

The clinical implications of these data include the advisability of using moderate pressure massage [5] and focusing the massage on both the hamstrings and quadriceps to achieve the pain reduction. As in previous research, the addition of self-massage on the days between massage therapy sessions might lead to even greater therapy effects [6-8].

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