The Effect of the Posture of the "Hermit Doing Body Contortion" on Relief of Shoulder and Scapular Pain Caused by Chronic Myofascial Pain Syndrome: A Randomized, Parallel Group, Controlled Trial

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ABSTRACT

Objective: To explore the ability of the posture of the "Hermit Doing Body Contortion" (HDBC) to relieve shoulder and scapular pain in patients with chronic myofascial pain syndrome (MPS).

Methods: One hundred and thirty-six out-patients with chronic MPS were randomly assigned to one of two groups. The experimental group was advised to perform a posture of the HDBC named "posture for relieving abdominal pain, pain of the scapular blade" (PRASP) every day for two months. Both groups received Thai traditional massage treatment and hot herbal compresses once a week for four weeks. Using a numeric rating scale and dolorimeter, outcomes were assessed prior to commencing the intervention (M_0), and one and two months after commencing the intervention (M_1 and M_2).

Results: The mean change in pain intensity between M_1 and M_2 differed significantly between the groups (1.32±1.45 in the experimental group and 0.47±2.26 in the control group; p = 0.039). Similarly, the mean change in pressure pain threshold between M_0 and M_2 also differed significantly between the groups (1.39±1.76 in the experimental group and 0.53±1.90 in the control group; p =0.027). In both cases, the experimental group achieved greater pain relief.

Conclusion: In patients with chronic MPS, the posture of the HDBC combined with standard Thai traditional medicine treatments provided better ongoing relief of shoulder and scapular pain than did standard Thai traditional medicine treatments alone.

Clinical trial registration no.: TCTR20151230002

Keywords: Hermit doing body contortion; court-type Thai traditional massage; myofascial pain syndrome; scapular; shoulder

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INTRODUCTION

Thai Traditional Medicine is becoming established as a recognized health care profession in Thailand.[1] The most famous treatment procedure in Thai traditional medicine is Thai traditional massage which is used to relieve pain of chronic muscle pain. MPS is a frequently occurring and important cause of chronic pain in middle-aged subjects.[2] It means that MPS is one of the most important causes of pain.[3,4,5] Assessment of patients attending the Ayurved Clinic of Applied Thai Traditional Medicine because of shoulder pain often results in diagnoses of MPS. Treatment with court-type Thai traditional massage and hot herbal compresses generally reduces such shoulder pain for a short period, although the pain usually recurs.The standard treatments for MPS in Western medicine are trigger point eradication, botulinum toxin injection, and drugs. Trigger point eradication involves multiple modalities; namely, stretching, massage, physical therapy, acupuncture, dry needling, and trigger point injection.[6,7]

Since 1836, a son of King Rama V ordered royal sculptors to build the 80 statues of the HDBC postures and had poets compose poems to describe the benefit of each posture.[8] In ancient times, performing these postures was known to prevent and relieve both muscle strain and pain. In the authors' experience, performing the posture of the HDBC is an effective means of managing the symptoms of patients with MPS. One of these ancient wisdom postures is called the "PRASP". This posture stretches the pectoralis and biceps muscles and is likely to strengthen the trapezius, rhomboid, supraspinatus, and infraspinatus muscles.[9] Because the efficacy of this posture has not yet been assessed scientifically, the authors designed a study to do so.

The aim of this study was to explore the ability of the "PRASP" to reduce shoulder and scapular pain in patients with chronic MPS when combined with standard treatment comprising court-type Thai traditional massage and hot herbal compresses compared with a control group receiving standard treatment alone. The primary outcome was pain intensity according to a numeric rating scale and the secondary outcome was pressure pain threshold.

MATERIALS AND METHODS

Subjects

One hundred and thirty-six out-patients attending the Ayurved Clinic of Applied Thai Traditional Medicine Siriraj Hospital were recruited for research. Nine out-patients were excluded because they were not convenient to follow up. The study was approved by the Siriraj Institutional Review Board, Faculty of Medicine Siriraj Hospital, Mahidol University on 5 January 2010 (Si.583/2552) and the study ran from March 2010 to July 2011.

Inclusion criteria were as follows: age 18-50 years, chronic shoulder and/or scapular muscle pain for more than 3 months, never treated or treated for less than one month, and were diagnosed of MPS by physician at the Ayurved Clinic of Applied Thai Traditional Medicine. Exclusion criteria comprised comorbidities of psoriasis or osteoporosis, temperature more than 37.5°C, pregnancy, history of trauma or surgery involving the bones of the neck, shoulder and/or back, and arthralgia.[10]

Study design

After the subjects had provided written informed consent, they were allocated to one of two groups by randomization. The control group (68 subjects) was treated by court-type Thai traditional massage and hot herbal compresses and given general advice, whereas the 68 subjects in the experimental group were also asked to perform the posture of the HDBC named "PRASP" every day. By the end of study, 127 subjects remained, 64 in the experimental group and 63 in the control group. Nine subjects (four in the experimental and three in the control group) dropped out of the study because there were too busy to comply with the recommended treatment regimen (Fig 1).

Assessment

Assessment was performed on three occasions: on entry into the study (M_0) and one month (M_1) and two months (M_2) after entry.

The intensity of shoulder and scapular pain was self-assessed on a numerica rating scale from 0 to 10 (0 meaning no pain and 10 extreme pain).[11] Clinically significant improvement was defined as reduction in pain intensity by two or more levels.

The pressure pain threshold was assessed with a dolorimeter[12] (Dolorimeter Force Dial FDK; US Neurologicals, Washington, DC, USA) (FDK 20, 9 kgf × 0.11 kgf 10 kgf × 0.1kgf) by an applied Thai traditional medical practitioner (ATTM).

Intervention

All subjects received court-type Thai traditional massage and hot herbal compresses once a week for four weeks from a licensed ATTM. This standard treatment included the following: (i) basic massage of the shoulder; (ii) pressure on the fourth and fifth major signal points on back; (iii) pressure on the fourth major signal points on the shoulder; (iv) basic massage of the upper back; (v) basic massage of the neck; and (iv) hot herbal compresses on the shoulder and scapula. The lines and points of massage are shown in Table 1.

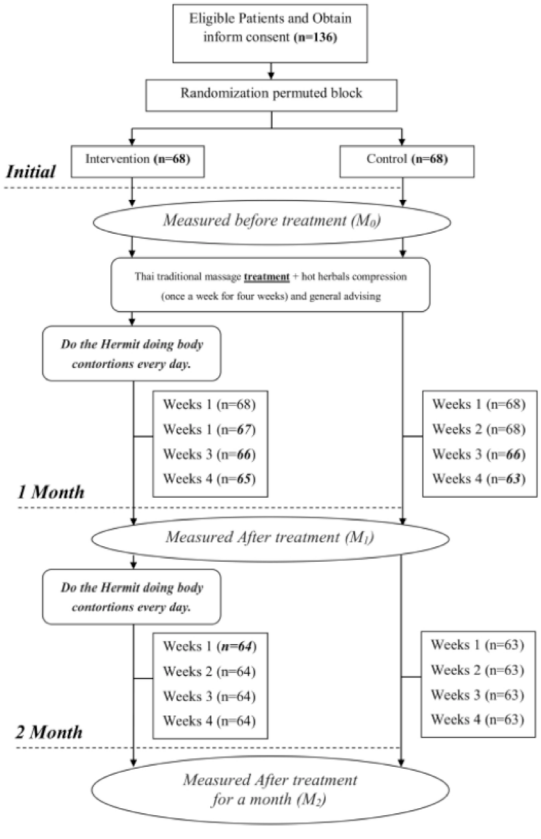


Fig 1. Study flow

All subjects also received general advice, which included a recommendation to avoid positions or behaviors that exacerbated their pain and to refrain from using any other treatment. Specific treatments they were asked to avoid included the following: injection at trigger points, acupuncture, use of topical cold or heat, analgesics including non-steroidal anti-inflammatory drugs, other types of exercise, and other forms of massage therapy.[1] Additionally, subjects in the experimental group were instructed in and asked to perform the posture of the HDBC known as "PRASP"five times, twice a day (morning and evening) for two months (Fig 2). These subjects were asked to record their compliance with these instructions in a diary; the diary and posture were checked by an ATTM at each assessment.

Statistical analysis

Descriptive statistical methods were used to calculate the percentage, mean and standard deviation. The effect of treatment was compared with the Chi-square test. *P*-values less than 0.05 were considered statistically significant. The pain numeric rating scale and pressure pain threshold were compared within and between groups using repeated measure ANOVA.

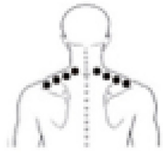
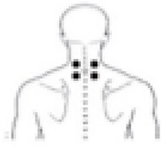
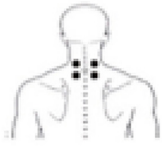
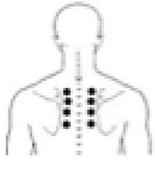
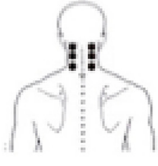
RESULTS

At the end of the study, results were available for 127 of the original 136 subjects, 64 in the experimental group (standard treatment plus the

The preparatory posture		Steps in performing the exercise
1. Sit with crossed legs	2. Extend the arms laterally parallel with the floor	4. Expand the chest and lift the shoulders at the back until you feel tightness around the shoulders and neck
	3. Bend the elbows to a right angle and flex the wrists with the palms facing upward	5. Hold for 10 seconds then resume the preparatory posture

Fig 2. The posture of the "Hermit Doing Body Contortion" known as "The Posture to Relieve Abdominal Pain, Pain of the Scapular Blade".

Table 1. Lines and points of massage and application of herbal compresses.

Line and points	Description	Time (minutes)
	1. Basic massage of the shoulder signal points on the back	20
	2. Pressure on the fourth and fifth major points	8
	3. Pressure on the fourth major signal points on the shoulders	2
	4. Basic massage of the upper back	10
	5. Basic massage of the neck	10
	6. Hot herbal compresses on the shoulder and scapula	10

specified posture of the HDBC) and 63 in the control group (standard treatment only). As shown in Table 2, there were no significant differences in general characteristics such as age, weight, height, body-mass index, occupation and duration of computer use.

As to numeric rating scale scores, at the two month (M_2) endpoint, 79.7% of subjects in the experimental and 61.9% in the control group reported reduction in pain by two or more levels, and this difference was statistically significant ($p = 0.03$). However, at one month (M_1), 53.1% of subjects in the experimental and 58.7% in the control group reported reduction in pain by two or more levels, and this difference was not significant ($p = 0.53$; Fig 3).

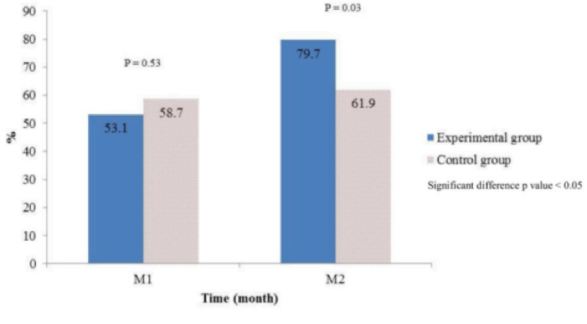


Fig 3. Percentage of subjects for whom pain intensity decreased by two or more levels between M_1 and M_2 according to grouop

TABLE 2. Relevant baseline characteristics of study subjects.

	Experimental group (N=68)	Control group (N=68)
Sex: n (%)		
Male	16 (23%)	11 (16.2%)
Female	52 (76.5%)	57 (83.8%)
Age (years): mean±SD	33.40±8.0	30.35±6.6
Weight (kg): mean±SD	57.43±8.9	56.48±9.2
Height (cm): mean±SD	162.13±6.8	160.88±6.3
BMI (kg/m^2): mean±SD	21.86±3.3	21.79±3.2
Occupation: n (%)		
Student	2 (2.9%)	7 (10.3%)
Doctor/nurse	6 (8.8%)	3 (4.4%)
Office staff	42 (61.8%)	43 (63.2%)
Salesperson	1 (1.5%)	1 (1.5%)
Business owner	10 (14.7%)	11 (16.2%)
Others	7 (10.3%)	3 (4.4%)
Duration of computer use (h/day)	5.89±2.8	5.94±3.0
Stress: n (%)		
No	3 (4.4%)	4 (5.9%)
Yes	65 (95.6%)	64 (94.1%)

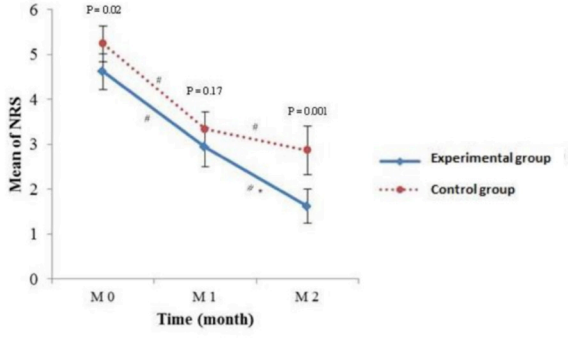


Fig 4. Pain intensity according to numeric rating scale scores according to group

Compared with M_o within group significant difference at $p < 0.001$

* Compared with M_1 within group significant difference at $p < 0.001$

P = compate between group significant differrence at $p < 0.001$

The mean pain intensity scores on the numeric rating scale on entry to the study (M_0) and one month (M_1) and two months (M_2) after entry were 4.62, 2.94, and 1.62, respectively, in the experimental group and 5.24, 3.34, and 2.87, respectively, in the control group (Fig 4). The differences between the groups were at M0 ($p = 0.02$), M_1 ($p = 0.17$) and M_2 ($p = 0.001$).

The mean changes in pain intensity over the three assessed periods (M_0 to M_1, M_0 to M_2, and M_1 to M_2) were compared within each of the groups. Expressed as mean difference ± SD, these values were 1.59±1.64, 2.91±1.72, and 1.32±1.45, respectively, in the experimental group and 1.87±1.93, 2.33±2.25, and 0.47±2.26, respectively, in the control group. All of these changes were statistically significant ($p<0.001$) except for between M_1 and M_2 in the control group ($p = 0.315$), as shown in Fig 4.

The means of pressure pain threshold as assessed with a dolorimeter on entry to the study (M_0) and one (M_1) and two months (M_2) after entry were 3.66, 4.67, and 5.08, respectively, in the experimental group and 4.01, 4.69, and 4.55, respectively, in the control group (Fig 5). These values did not differ significantly between the groups at any time point ($p = 0.27$, 0.96, and 0.11, respectively).

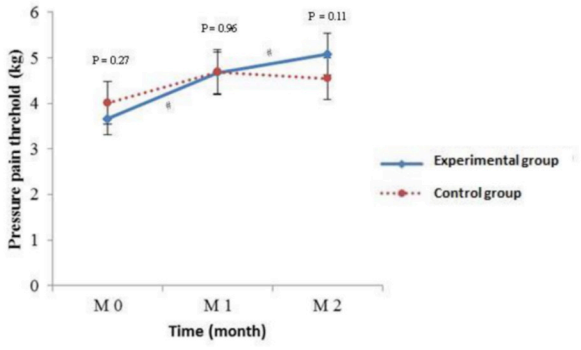


Fig 5. Pressure pain threshold according to dolorimeter according to group

Compared with M_0 within group significant difference at $p < 0.001$

* Compared with M_1 within group significant difference at $p < 0.001$

P = compate between group significant differrence at $p < 0.05$

The mean changes in pressure pain threshold were compared within groups over three time periods: M_1 to M_0, M_2 to M_0, and M_2 to M_1. These values, expressed as mean ± SD were 0.98±2.01, 1.39±1.76, and 0.41±2.18, respectively, in the experimental group. The changes between M_1 and M_0 and M_2 and M_0 were statistically significant (p<0.001 for both). In the control group they were 0.66±1.89, 0.53±1.90, and -0.13±1.76, respectively, the change between M_1 and M_0 being statistically significant (p = 0.023), as shown in Fig 5.

In terms of satisfaction, 87.5 % of subjects in the experimental group were satisfied with the results of the specified exercise and 92.2% planned to use the posture when they experienced pain.

DISCUSSION

As shown in the patient flow diagram (Fig 1), we enrolled 68 subjects into each arm of the study (M_0). Three participants in the experimental and five in the control group did not attend for their one month appointment because of work pressures. Therefore, at M_1 65 subjects remained in the experimental and 63 in the control group. One more subject in the experimental group failed to attend the two month appointment (M_2) for private reasons; thus, we had complete results for 64/68 participants in the experimental and 63/68 in the control group. The M_0 from the two groups were different in pain intensity, so the feelings of the participants were then divided into groups by RCT. The result was beyond the expectation of the researchers. The pressure pain threshold and results for the two groups were not significantly different. In addition, the study was conducted to measure change in pain intensity at different times which is shown in Fig 4 to illustrate the effectiveness of the posture of the HDBC.

At the end of the first month, there was no significant difference in pain intensity between the study groups; both had received standard treatment with court-type Thai traditional massage and hot herbal compresses. However, the superior efficacy of the experimental regimen, which included performing the posture of the HDBC, was detectable at M_2, when the experimental group had significantly milder pain intensity and higher pressure pain threshold than the control group (Figs 4 and 5).

Our findings clearly show that doing the posture of the HDBC known as "PRASP" in addition to receiving standard treatment reduced shoulder and scapular pain after two months (M_2) more effectively than standard treatment alone. As shown in Fig 3, a significantly greater proportion of subjects in the experimental than in the control group experienced reduction in pain intensity by two or more levels (p = 0.03). Additionally, as shown in Figs 4 and 5, the reduced pain intensity was accompanied by increased pressure pain threshold.

We have here presented the findings of preliminary research into the efficacy of the posture of the HDBC known as "PRASP" combined with court-type Thai massage and hot herbal compression in a randomized controlled trial. Originally, the ancients developed this and many other postures by practicing various postures to find out experientially how they caused muscles to tense up, shrink, or relax and wrote and interpreted poetry that documented their findings. They developed and recorded a whole body of knowledge about such postures in this way. There are still 80 poems and 24 statuesin existence that explain the posture of the HDBC; these could be

TABLE 3. Relation of age with pain intensity and pressure pain threshold.

		Experimental group			Control group			P value
		N	Mean	Sig[A]	N	Mean	Sig[A]	
Pain intensity								
	Age < 30	25	4.32 (1.51)		37	4.97 (1.62)		0.12
T0	Age 30-40	27	5.04 (1.34)	0.24	24	5.59 (1.41)	0.36	0.16
	Age > 40	16	4.38 (2.19)		7	5.43 (2.44)		0.32
	Age < 30	24	3.29 (1.60)		34	3.31 (1.72)		0.97
T1	Age 30-40	25	2.83 (1.61)	0,41	22	3.45 (1.37)	0.87	0.17
	Age > 40	16	2.56 (2.16)		7	3.14 (1.21)		0.52
	Age < 30	24	1.71 (1.60)		34	3.02 (2.19)		0.01*
T2	Age 30-40	24	1.67 (1.20)	0.82	22	2.67 (1.94)	0.67	0.04*
	Age > 40	16	1.41 (1.89)		7	2.43 (2.70)		0.31
Pressure pain threshold								
	Age < 30	25	3.31 (1.24)		37	3.42 (1.60)		0.46
T0	Age 30-40	27	4.32 (2.00)	0.03	24	4.79 (1.77)	0.01	0.38
	Age > 40	16	4.02 (1.45)		7	4.60 (1.37)		0.38
	Age < 30	24	4.78 (1.91)		34	4.57 (1.81)		0.66
T1	Age 30-40	25	4.64 (1.57)	0.70	22	4.93 (1.88)	0.13	0.57
	Age > 40	16	5.11 (1.68)		7	6.19 (2.56)		0.24
	Age < 30	24	4.80 (1.61)		34	4.25 (1.64)		0.21
T2	Age 30-40	24	5.43 (2.02)	0.47	22	5.75 (1.84)	0.01	0.58
	Age > 40	16	5.12 (1.67)		7	5.27 (2.50)		0.86

[A]One way ANOVA test within group, *Compare between groups significant difference at p value <0.05

the basis of further research for improving and maintaining the knowledge developed in ancient times. There is a research article on comparing yoga, which is a familiar exercise with HDBC, with stretching-strengthening exercises. The research has shown that yoga practice is just as effective as stretching-strengthening exercises in improving functional fitness, in terms of balance, strength, flexibility, and mobility.[13] The posture of HBDC named PRASP can stretch many parts of the muscle. For example, when sitting with crossed-leg position, quadriceps femoris, hamstrings, and tibialis anterior are stretched. Furthermore, when you perform the posture, it will stretch trapezius, rhomboids, deltoid, biceps brachii and triceps brachii muscle which can relieve shoulder and scapular pain[9].

Assessment of the pain of patients with MPS using a dolorimeter[14] is useful for assessing specific treatments during rehabilitation[15], although it is not very practical in clinical settings. Nonetheless, the dolorimeter is a reproducible way of measuring pain. Assessment of pain symptom using the numeric rating scale is useful, although, it is a subjective form of assessment. Thus, the combination of numeric rating scale scores and dolorimeter readings used in this study was optimal for effectively and accurately assessing the subjects' shoulder and scapular pain. The subjects were split into age and additional testing was conducted to see whether age affected pain intensity and pressure pain threshold with one way ANOVA for analyzing the relationship between age and time. Furthermore, Independent paired T-test was used for comparing between groups in each age and time. As shown in Table 3, there was no statistically significant difference in pain intensity.

One limitation of this study was that we did not incorporate a suitable placebo posture of

the HDBC for the control group. Also, it was of relatively short duration, so we suggest that future studies should be longer to better ascertain the effects of the posture of the HDBC.

CONCLUSION

Performing the posture of the HDBC known as "PRASP" repeatedly over many days combined with massage and hot compresses reduces the pain of subjects with MPS. The participants were highly satisfied with this practice and reported no complications.

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