The effect of traditional Chinese Therapeutic Massage on individuals with neck pain

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***Objective*: To determine the effect of Traditional Chinese Therapeutic Massage on individuals with neck pain.**
***Design*: Randomized controlled clinical trial.**
***Setting*: University laboratory.**
***Participants*: Thirty-one volunteers with neck pain and loss in range of motion, for longer than one year were recruited from California State University staff and faculty. A total 28 subjects completed the study.**
***Intervention*: Traditional Chinese Therapeutic Massage (TCTM) and a home based, self-administrated exercise program.**
***Main outcome measurement*: A previously published neck pain questionnaire was used to measure pain intensity and the quality of life. A neck range of motion test was used to assess the changes in neck flexibility.**
***Results*: The TCTM group had a significant reduction in the scoring of pain questionnaire ($p < 0.05$) and significant improvement in ROM ($p < 0.05$), after 6 week's treatment, and after 6 week's follow-up. The exercise plus TCTM appeared to be equally effective as TCTM alone.**
***Conclusion*: Traditional Chinese Therapeutic Massage provided significant benefit to those suffering from neck pain. Further studies need to address the combination of the treatments using TCTM and the therapies in mainstream medicine.**

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INTRODUCTION

The popularity of alternative medical treatment has increased during recent years, with acceptance by both patients[1,2,3] and physicians.[4] Massage has been documented as one of the most frequently used alternative treatments.[3,4] In China, therapeutic massage (TuiNa in Chinese) has been applied as a form of medical treatment since 2700 B.C. Traditional Chinese Therapeutic Massage (TCTM) has been used to treat musculoskeletal diseases, medical diseases, gynopathy and many childhood illnesses, such as fever and diarrhea. The principal styles of TCTM in southern China include one-finger meditation style (Yi Zi Chang TuiNa), rolling style (Guen Fa TuiNa), and massage based on internal style martial arts (Nei Gong TuiNa).[5,6] To date, a review of the literature did not reveal any

Table I Trial design

Phase I (6 weeks)		
Group A	10 subjects	Receive TCTM treatment
Group B	10 subjects	Exercise program
Group C	11 subjects	Control group without any treatment
Phase II (immediately after phase I, 6 weeks)		
Group A	10 subjects	No treatment
Group B	10 subjects	No treatment
Group C	11 subjects	Receive TCTM and exercise program

controlled clinic trial documenting the effects of this traditional treatment in Western country.

The present study focused on the use of one-finger meditation massage and rolling massage as a treatment for individuals suffering from neck pain. Traditional Chinese Therapeutic Massage was compared to a commonly used method that treats neck pain patients with self-applied moist heat followed by stretching exercises.

METHODS

Subjects

Thirty-one subjects with 'neck pain' were recruited from the staff and faculty of California State University, Northridge. The inclusion criteria were as follows:

1. Episodes of neck pain and loss in range of motion for a period exceeding one year.
2. Noticeable daily neck pain and tightness.
3. Neck muscle pain and tightness was associated with a mechanical disorder of the cervical spine, such as whiplash/trauma, chronic use, disc degeneration, and post-herniated nucleus pulpous.
4. No regular therapeutic treatment (more than once a week) in the previous three months for their neck pain including chiropractic, physical therapy, acupuncture, massage therapy, injection therapy, relaxation therapy, biofeedback, or hypnosis. Subjects were allowed to continue the medications they were already consuming for neck pain, recording medication dosages in a daily journal. However, they were asked to discontinue any other non-drug therapies related to neck pain.

Trials design

This study is a randomized control trial with crossover. The subjects were randomly assigned to three groups (group A, B, C) by a pre-generated random assignment schema. The study included two phases with subjects in all three groups participating in both phases. In phase I, group A received TCTM treatment, group B received exercise and group C was the control group. In phase II, groups A and B discontinued the treatment program to evaluate the follow-up effects, and group C received both TCTM and exercise. For details please see Table 1.

Informed consents were obtained prior to baseline test. The study was proved by the IRB of Cal-State University Northridge.

One-finger meditation massage

One-finger meditation massage is the primary technique in the one-finger meditation style. It has been practiced in southern China since the Qing Dynasty (1644–1911 A.D.) and is presently one of the major components of TCTM. One-finger meditation massage uses the tip and (or) the whorled surface of the thumb to rub soft tissue. The massage consists of a swing of the thumb including one forward swing and one backward swing in one pass. The frequency is about 120 passes (including one forward and one backward) per minute. The strength of the massage is generated from the upper body and shoulder of the therapist, not the arm, which allows the massage to continue for a long period without therapist fatigue occurring. The massage requires manipulations to be soft, yet eventually strong and penetrating. Philosophically, this technique, described as a 'million drops of water will eventually break through a rock, stresses the sensitivity of the therapist's thumb'. Though swinging with high frequency, the thumb is constantly in contact with the source of discomfort to sense any indication of developing soft tissue problems such as a muscle spasm or an adhesion. One-finger meditation massage is usually applied to specific muscles, tendons and other small areas because of its localized contact although it has also been used to massage acupuncture points and treat internal diseases[5,6] (see Figure 1).

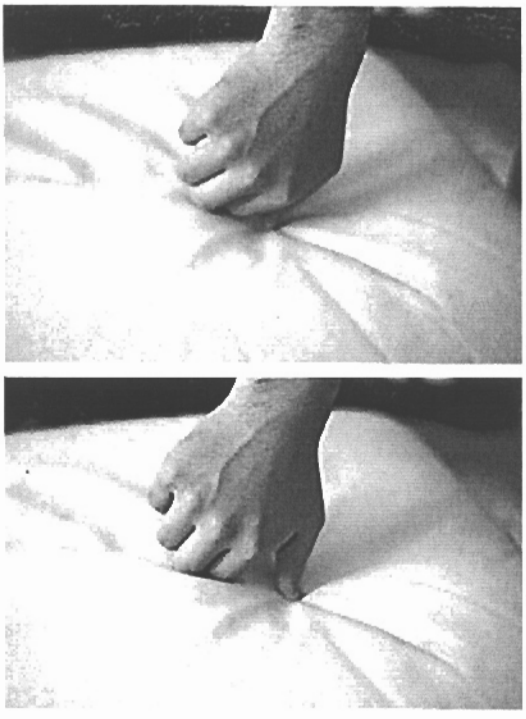

Fig. 1 One-finger meditation massage.

Rolling massage

Rolling massage is the primary technique in rolling style and was developed in the 1940s based on the same philosophy as one-finger meditation massage.

The characteristics of rolling massage are similar to one-finger meditation massage except rolling massage uses the fifth metacarpophalangeal joint and the hypothenar eminence, instead of the thumb, to apply the manipulation. When working on larger areas of tissues, rolling massage can generate greater force and have contact with a larger surface area than one-finger meditation massage[5,6] (see Figure 2).

Both one-finger meditation massage and rolling massage are complex skills requiring significant training beginning with an exercise, called '*Yi-Jin-Jing*', which combines martial arts strength training and meditation.[6] The trainee practices this technique on bags of rice before practicing on the human body. The principal investigator of this study is a licensed acupuncturist in California, trained in TCTM for five years through the Shanghai University of Traditional Chinese Medicine and Pharmacology. All treatments conducted in this study were administrated by the principal investigator (SYC).

Massage program

The massage treatment in this study was a combination of the one-finger meditation massage and

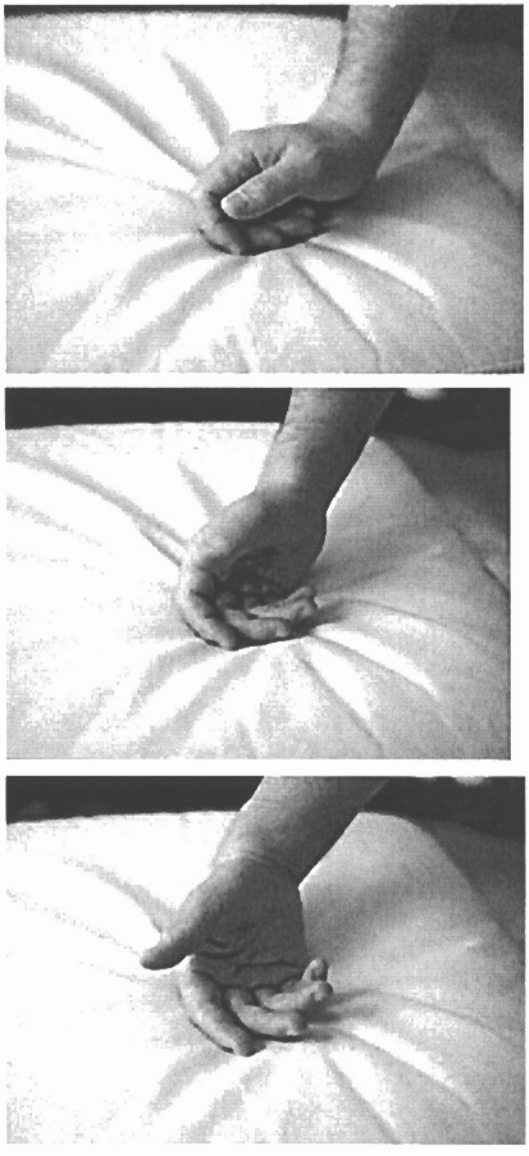

Fig. 2 Rolling massage.

rolling massage. The treatment began with rolling massage to provide general relaxation to the major muscles in neck and upper shoulder region. When the subject was relaxed one-finger meditation massage was used to search and treat any perceived abnormal soft tissue sites. Subjects received a 30-min massage treatment, 3 times per week, for a duration of 6 weeks.[5,6]

Therapeutic exercise program

The exercise program included two steps: (1) application of moist heat on the neck area for 10 min followed by specific stretching exercise for 10 min. The daily exercise program was a home-based exercise program including head tilt, trape-

zius stretch, neck flexion, shoulder rolls and neck rolls. The subjects met with a physician at the beginning of the study to learn and practice the exercise program. The physician also provided the subject a heating pad made from an athletic tube sock filled with brown rice which could be heated in a microwave for 2 min. This will generate a moist heat for 20 min. The physician contacted subjects, by telephone once a week, regarding the exercise program to verify their participation. At the mid point (week 3) and the end of the treatment period (week 6) the subjects met with the physician regarding their exercise treatment. The rational for this protocol was that it might replicate a plausible physician–patient encounter and treatment course.

Measurements

Northwick Park Neck Pain Questionnaire[7] was used to measure pain intensity, frequency and discomfort relate to neck pain in daily life. Potential range of the score is from 0 to 100. The higher score represents the higher pain intensity and discomfort. A neck range of motion (ROM) test conducted by one evaluator was used to assess subjects.[8] The evaluator was masked to the assigned groupings and did not communicate with subjects regarding their treatment. The reliability of the ROM evaluator was established prior to the study, by measuring 10 healthy college age students' neck ROM in flexion, extension, lateral flexion and rotation three times on different days. Pearson correlation tests showed a significant correlation among the repeated ROM test ($p < 0.05$).

The Neck Pain Questionnaire and neck ROM measurement were taken before phase I, between phases I and II, and after phase II.

Statistics

Data were analyzed with a 2-way repeated measures ANOVA, followed by post hoc Tukey tests. The level of significance was established as $p < 0.05$.

RESULTS

Twenty-eight subjects completed the study. The characteristics of subjects in the three groups are summarized in Table 2.

One subject from group A withdrew because she had a cervical fusion prior to the study and her orthopedic surgeon suggested she discontinue participation. The other two withdrew from group B due to personal family problems. The test of ROM was only on extension, flexion, and the average of right and left lateral flexion. Rotation was measured, but is not included in statistical analysis because the ROM in rotation for all subjects was essentially in the normal range before treatments began. One subject had difficulty performing the ROM test because of a spinal malformation caused by post-polio syndrome.

The TCTM group had significantly lower scoring in neck pain questionnaire compared to the exercise and control groups immediately after phase I ($p < 0.05$). We also found statistically significant improvements within TCTM group

Table 2 Subject's characteristics at baseline

		Group A	Group B	Group C
Total number		10	10	11
Gender	Male	2 (20%)	3 (30%)	3 (27.3%)
	Female	8 (80%)	7 (70%)	8 (72.7%)
Age		47 ± 11	48 ± 13	51 ± 7
Major causes of neck pain				
• Trauma (most are car accidents)		6 (60%)	2 (20%)	3 (27.3%)
• Chronic use or stress related		3 (30%)	6 (60%)	7 (63.6%)
• Post-herniated nucleus pulposus with spinal fusion operation		1 (10%)	2 (20%)	(0%)
• Spinal malformation caused by arthritis		0 (0%)	0 (0%)	(9.1%)
• Spinal malformation caused by post-polio syndrome		1 (10%)	0 (0%)	0 (0%)
Taking medication for neck pain	Yes	4 (40%)	4 (40%)	6 (54.5%)
	No	6 (60%)	6 (60%)	5 (45.5%)
Withdrew from study		1 (10%)	2 (20%)	0 (0%)

Table 3 Means and SD of Northwick Part Neck Pain Questionnaire, degree of ROM in extension, flexion and lateral flexion

Outcome measure	Groups	*N*	Before phase I	After phase I	After phase II
Northwick Park Neck Pain Questionnaire	Group A (TCTM)	9	32.46 ± 8.59	13.24 ± 11.88***†	13.43 ± 9.96***
	Group B (exercise)	8	27.81 ± 11.90	20.23 ± 12.06	17.46 ± 11.97*
	Group C (control and then received both treatments)	11	31.51 ± 12.11	35.64 ± 12.54	13.29 ± 11.18***
ROM in extension Normal range (45–75)	Group A (TCTM)	9	40.38 ± 12.52	49.38 ± 13.71**	49.25 ± 11.18**
	Group B (exercise)	8	44.38 ± 12.96	48.38 ± 11.8	47.38 ± 11.11
	Group C (control and then received both treatments)	11	46.5 ± 15.26	46.8 ± 13.59	53.1 ± 11.84*
ROM in flexion Normal range (45–60)	Group A (TCTM)	9	40.00 ± 6.21	50 ± 3.74**	44.88 ± 10.17
	Group B (exercise)	8	39.75 ± 12.42	48.62 ± 14.04*	46.88 ± 13.36
	Group C (control and then received both treatments)	11	46.30 ± 13.83	44.1 ± 12.28	49 ± 8.38
ROM in lateral flexion (average between right and left) Normal range (45–45)	Group A (TCTM)	9	38.75 ± 11.3	45.19 ± 9.97**	42.94 ± 6.19
	Group B (exercise)	8	38.19 ± 10.26	41.63 ± 12.82	44.75 ± 12.52**
	Group C (control and then received both treatments)	11	38.35 ± 8.59	40.95 ± 7.60	46.55 ± 7.27**

Note. A lower score on the neck pain questionnaire is considered as less pain.

† $p < 0.05$ base line (before phase I) comparison among groups.

* $p < 0.05$ compare with pre-test (before phase I).

** $p < 0.01$ compare with pre-test (before phase I).

*** $p < 0.001$ compare with pre-test (before phase I).

comparing to the baseline ($p < 0.05$) after 6 weeks treatment. After phase II, the improvement for combined treatment of TCTM and exercise is also significant ($p < 0.05$). The treatment effect of TCTM alone was able to maintain after 6 week's follow-up without treatments. The means and standard deviation from the Neck Pain Questionnaire, degree of ROM in extension, flexion and lateral flexion are shown in Table 3. The TCTM group showed consistently significant improvement in all three ROM tests as did their scores in the Neck Pain Questionnaire.

In this study, we did not conduct a statistical test for the changing medication. Most of subjects were taking medications for neck pain but also for other reasons including depression, sleeping problems and pain in other parts of the body. However, the diaries of subjects showed there were a general reduction of medication dosage and frequency in all three groups.

DISCUSSION

The Northwick Park Neck Pain Questionnaire used in this study was the primary instrument to assess the effect of TCTM treatment on neck pain. The questionnaire included questions about intensity and duration of pain and the discomforts relate to neck pain in daily activities such as driving, carrying objects, sleeping, reading, watching television, work and house work, and social activities.[7] The results indicated that both TCTM and exercise, separately and together were effective at diminishing pain and discomfort in daily life. It would appear that the effects of TCTM were experienced sooner and stronger than exercise alone which is supported by Neck Pain Questionnaire and ROM data.

Exercise plus TCTM appeared to be equally effective as TCTM alone but better than the result of exercise only, suggesting that TCTM may provide the initial major contribution to the treatment effect. A follow-up interview with groups determined that, despite instructions not to continue the exercise program at the end of phase I (6 weeks), some of the subjects ($n = 4$) in the exercise only group admitted to continuing the moist heat and stretching exercise. However, improvements in ROM for the TCTM group seem more consistent than the exercise group. A confounding factor for this study may have been that the mean baseline values for ROM were all in the low normal range,

thus limiting the possibility of improvement in these outcome measures.

From this initial study, the use of TCTM to treat neck pain seems quite effective. Whether the relief of neck pain is due to an increased ROM would be speculative, although the increase would certainly contribute to improved quality of life activities requiring head movement. This study documents the effectiveness of TCTM in the hands of this practitioner. Further study is required to determine if the technique as practiced by others would be equally beneficial for relief of neck pain, as well as to begin to identify the mechanism for its effectiveness.

CONCLUSION

The purpose of this study was to evaluate TCTM and attempt to combine the ancient eastern technique with modern treatment. Using the special mechanical characteristics of one-finger meditation massage and rolling massage—high frequency rubbing with soft but strong and penetrating force, these techniques provide significant benefit to those suffering from neck pain. Further studies need to determinate the mechanisms of one-finger meditation massage and rolling massage in treating neck pain. We also need to address the combination of treatments using TCTM and the therapies of mainstream medicine for other diseases.

REFERENCES

1. Eisenberg D.M., Davis R.B., Ettner S.L., Appel S., Wilkey S., Van Rompay M., Kessler R.C. Trends in alternative medicine use in the United States, 1990–1997: results of a follow-up national survey. JAMA 1998;280(18):1569–1575.
2. Furnham A., Forey J. The attitudes, behaviors and beliefs of patients of conventional vs complementary (alternative) medicine. J Clin Psychol 1994;50: 458–469.
3. Astin J.A. Why patients use alternative medicine: results of a national study. JAMA 1998;279:1548–1553.
4. Astin J.A., Marie A., Pelletier K.R., Hansen E., Haskell W.L. A review of the Incorporation of Complementary and Alternative Medicine by Mainstream Physicians. Arch Intern Med 1998;158:2303–2310.
5. Zhang EQ, Wang GC, Fan YI, Guan Z. Chinese massage. ShangHai University of Traditional Chinese Medicine; 1994 [in Chinese and English].
6. Chao RF, Yan JT, Luo ZY, Jing DC, Huang XN. Chinese TuiNa. People's Health; 1992 [in Chinese].
7. Leak A.M., Cooper J., Dyer S., Williams K.A., Turner-Stokes L., Frank A.O. The Northwick Park neck pain questionnaire devised to measure neck pain and disability. Brit J Rheumatol 1994;33:469–474.
8. Norkin C.C., White D.J. Measurement of joint motion: a guide to goniometry. 2nd ed. Philadelphia: Davis, 1995.