

Treatment of Neck Pain with Collateral Meridian Acupressure Therapy: A Randomised, Sham-Intervention Controlled Trial

Kaikit Wong* BSc
Brendan Yap
Bill King-Piu Fung BMed, MHPEd, GDipAcup, MMedStat, AdvDipTCM

Sydney Institute of Traditional Chinese Medicine, Australia

ABSTRACT

Background: Collateral Meridian Acupressure Therapy (CMAT) is a relatively new technique that has been developed to relieve intractable pain. Little research has been, however, conducted to examine its effect on neck pain. The purpose of this study was to investigate the short-term effect of CMAT on neck pain. **Method:** In this randomised, sham-intervention control, patient-therapist blind trial, 60 patients who suffered from neck pain and had restricted neck movement were recruited. Participants were randomly allocated into the treatment group ($n = 30$) and control group ($n = 30$). CMAT was performed on the treatment group, while the control group received sham treatment. Severities of pain before and after the treatment were measured on a scale of 0 (no pain) to 5 (most severe pain). Chi-square and t-tests were used to analyse categorical and continuous data, respectively. **Results:** All participants completed the study. Prior to the treatment, there was no group difference in demographic or pain data. After the treatment, the severity of neck pain in the CMAT group (0.7 ± 0.6) was significantly less than that in the control group (2.8 ± 0.9). **Conclusion:** CMAT may induce an immediate analgesic effect on neck pain. Its long-term effect requires further research.

KEYWORDS Acupressure, neck pain, collateral meridian acupressure therapy, RCT

Introduction

Neck pain is a common symptom encountered by a high proportion of the population. With an increase in internet and computer usage, this affliction is becoming more and more predominant among office workers and students who use the computer daily for long hours.¹ Neck pain is usually a result of repetitive stress, degeneration and deformity of the cervical vertebrae as well as a loss of the natural curvature of the cervical spine.² Different methods of Chinese medicine may be used effectively to control and treat neck pain. A

quantitative meta-analysis has found that acupuncture is effective in the short-term treatment of neck pain.³ Other researched modalities are moxibustion, cupping⁴, point-injection⁵ and electro-acupuncture^{6,7}. Local acupuncture points such as GB20 *Fengchi* (风池) and GB12 *Wangu* (完骨)⁸, and distal acupuncture points such as SI 3 *Houxi* (后溪)⁹ and Luozhen (落枕) have been studied.^{11,12} Abdominal points (that correspond to the tortoise plastron)¹³ and scalp acupuncture have also been extensively used in the treatment of neck pain.¹⁴⁻¹⁶ Some of those modalities involve strong manipulation either with electricity stimulation or vigorous manual lift and thrust methods.^{8,11}

* Correspondent author; e-mail: kaikitw@gmail.com

Although a large percentage of patients may benefit from appropriate administration of acupuncture and/or moxibustion, many patients still hesitate to choose these treatments due to needle phobia, fear of pain, fear of strong physical manipulation, inconvenience of lengthy courses of treatment, and/or the high treatment cost. These reasons may often lead to delayed treatment, resulting in worsened and chronic pain.

In a paper published in the *TCM Shanghai Journal of Acupuncture and Moxibustion*, Dr Shan-Chi Ko proposed an effective treatment of cervical spondylopathy by pressing distant acupoints.¹⁷ It was discovered that by first identifying the affected meridian where the worst pain was located, and then pressing corresponding points on the distal parts of the body, the pain relief could be almost immediate. Contralateral acupressure may yield better therapeutic results than acupressure on the affected side.¹⁸ This discovery was later developed into the Collateral Meridian Acupressure Therapy (CMAT). It is found that manipulating two acupoints on a collateral meridian is more effective than local needling or treating the affected meridian alone.¹⁸ The two acupoints are (1) the *control point* for connecting the affected meridian, and (2) the *function point* for influencing the affected location. CMAT has been found to achieve dramatic results in reducing intractable pain in Complex Regional Pain Syndrome (CPRS)^{18,19} primary dysmenorrhea²⁰, and backache due to post-regional anesthesia procedure²¹.

The current study was carried out to investigate the short-term effect of CMAT in relieving neck pain. The hypothesis was that CMAT would reduce neck pain significantly better than sham intervention did.

Participants and Methods

This study was approved by the Education and Ethics Committee of Sydney Institute of Traditional Chinese Medicine, which also serves as a research ethics panel.

Participants were recruited amongst patients who attended a clinic of Chinese medicine. Patients with chief complaint of neck pain were included. Patients under 12 years of age, or who had surgical procedure in their neck region were excluded. Cervical radiculopathy was not part of the exclusion criteria. A total of 60 participants were recruited for the trial. Each one had pain and difficulty with either side-to-side neck rotation, or neck flexion and extension, or both. All participants had given written consent. The participants were randomly allocated into the CMAT group ($n = 30$) and the control group ($n = 30$). The randomisation was done by an interviewer by flipped a coin without knowing if heads/tails was to be the treatment or control group. The participants were also blind to their group allocation.

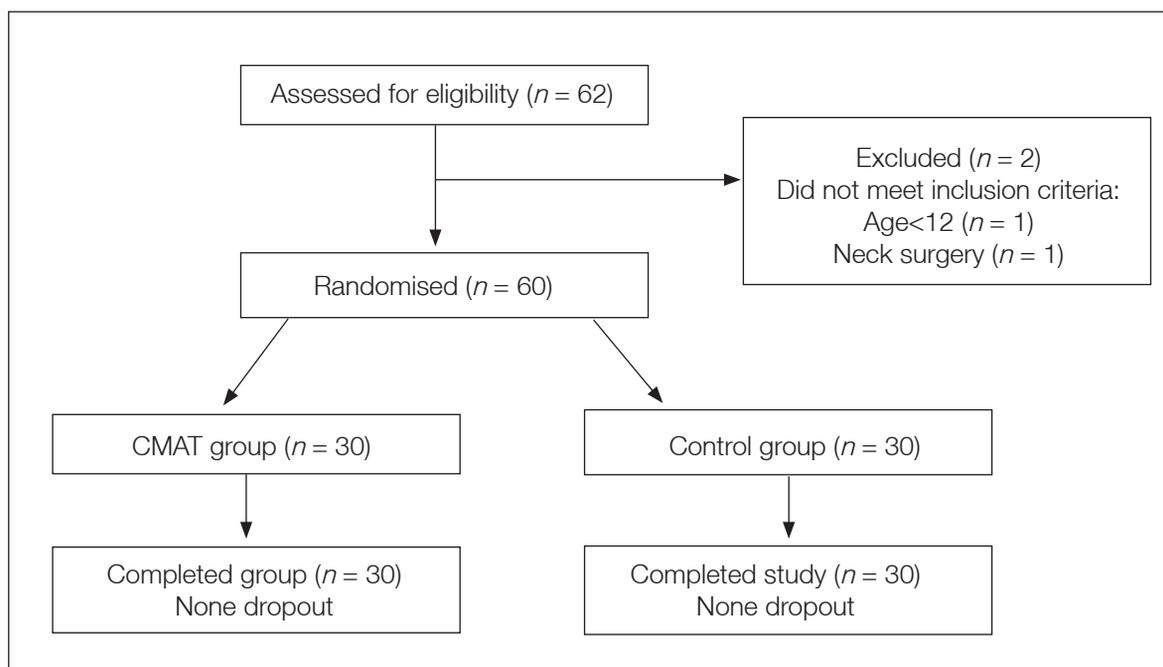


FIGURE 1 Flow chart of selection process

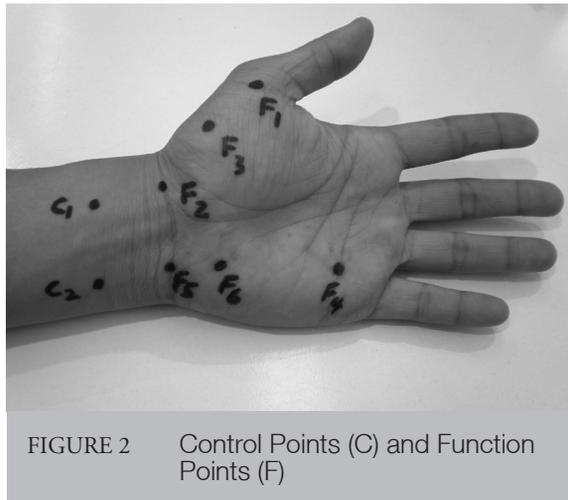


FIGURE 2 Control Points (C) and Function Points (F)

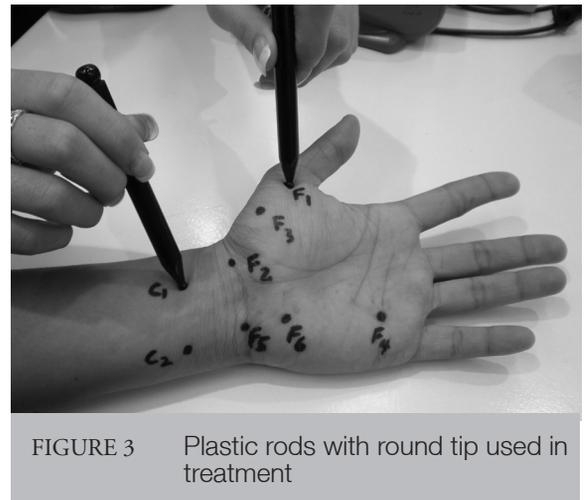


FIGURE 3 Plastic rods with round tip used in treatment

All participants were interviewed before their treatment. Data about their age, gender, duration of pain, location of pain, and severity of pain were recorded. The duration of pain was recorded as categorical data – acute and chronic, where acute was less than or equal to 12 weeks and chronic was more than 12 weeks. Pain scores were measured on a scale of 0 (no pain) to 5 (most severe pain). After the treatment, participants were asked to rate their neck pain again. The interviewer who collected the data and the practitioner who performed the treatment were not the same. The practitioner was an accredited qualified acupuncturist who had no knowledge about the pain scores of the participants at any point in time.

One session of treatment was given to all participants. For the CMAT group, a standard treatment protocol was used. Points F_1 , F_2 and F_3 were pressed one by one as function points in this sequence, while holding C_1 as the control point (Figure 2). Next, points F_4 , F_5 and F_6 were pressed as function points in this sequence, while holding C_2 as the control point (Figure 2). The same six points were repeated on the other arm in the same sequence. Pressure was maintained at each point for a minute using a plastic rod with slightly pointed round tip (Figure 3). Sufficient pressure was applied to each point till the patient felt some tenderness or pain on the point. For the control group, the same protocol was conducted with the exception that the points were touched gently without any pressure.

The data were entered into statistical software (JMP-IN 3.2.1, SAS Institute Inc.). The chi-square tests and t-tests were used to analyse the categorical and continuous data, respectively. The level of significance was set at $\alpha = 0.05$.

Results

A total of 60 participants with neck pain were recruited to this study. All participants completed the study and no side effects were reported. Table 1 summarises the demographic information of the two groups. There were no statistically significant differences between the two groups in terms of age, gender, duration and location of pain. The majority of participants in the two groups experienced pain along both the bladder and gall bladder channels.

The pain scores before and after treatment for both groups are presented in Tables 2 and 3 respectively.

Mean and standard deviation of the pain scores before and after treatment in two groups are presented in Table 4.

Results of the independent two-sample t-tests showed that prior to the treatment, there was no group difference in pain severity; and after the treatment, the CMAT group reported significantly lesser pain than the control group did ($p < 0.0001$).

Discussion

This study aimed to evaluate if CMAT was effective in relieving neck pain. CMAT is based on the theory of *Zang Fu Bie Tong* (脏腑别通), also known as *Zang Fu Tong Zhi* (脏腑通治)²². *Zang Fu Bie Tong* and *Zang Fu Tong Zhi* are translated as the Extraordinary Connection of *Zang Fu* by Dr Wei Jie Yang (杨维杰).²³ This system of the channels pairing is less familiar for most practitioners of Chinese medicine, compared with the more commonly known pairs such as the internal-external pairs (表里经), and the same name pairs (同名经). The pairing system is illustrated in Table 5.

TABLE 1 Demographic profile

		CMAT Group (n = 30)	Control Group (n = 30)
Age (yr) (mean±SD)		32.2±2.2	29.7±2.0
Gender N (%)	Male	16 (53)	15 (50)
	Female	14 (47)	15 (50)
Duration of pain N (%)	Acute	12 (40)	15 (50)
	Chronic	18 (60)	15 (50)
Location of pain N (%)	Along bladder channel	7 (23)	4 (13)
	Along gall bladder channel	10 (33)	9 (30)
	Along both bladder and gall bladder channels	13 (44)	17 (57)

(Data are mean±SD for continuous variables, and number (%) for categorical variables, $p > 0.05$ for all comparisons.)

TABLE 2 Pain scores of the two groups before the treatment (number [%])

	0	1	2	3	4	5	Total
CMAT	0 (0)	0 (0)	3 (10)	13 (43)	12 (40)	2 (7)	30
Control	0 (0)	0 (0)	6 (20)	14 (46)	8 (27)	2 (7)	30

TABLE 3 Pain scores of the two groups after the treatment (number [%])

	0	1	2	3	4	5	Total
CMAT	10 (33)	18 (60)	2 (7)	0 (0)	0 (0)	0 (0)	30
Control	1 (3)	0 (0)	10 (33)	12 (40)	7 (24)	0 (0)	30

TABLE 4 Pain scores of the two groups before and after treatment (Mean±SD)

	CMAT	Control	<i>p</i>
Before treatment	3.4±0.7	3.2±0.8	0.269
After treatment	0.7±0.6	2.8±0.9	<0.0001

TABLE 5 Collateral Channels used in *Zang Fu Tong Zhi*

Open		Pivot		Close	
<i>Tai Yang</i>		<i>Shao Yang</i>		<i>Yang Ming</i>	
Bladder	Small intestine	Gall bladder	<i>San Jiao</i>	Stomach	Large intestine
↕	↕	↕	↕	↕	↕
Lung	Spleen	Heart	Kidney	Pericardium	Liver
<i>Tai Yin</i>		<i>Shao Yin</i>		<i>Jue Yin</i>	

Pain is due to a blockage of qi. Most of the participants had neck pain located along the bladder channel and the gall bladder channel, meaning there was a blockage of qi in those channels. According to the *Zang Fu Tong Zhi*, the bladder channel corresponds with the lung channel and the gall bladder channel corresponds with the heart channel. By pressing points on their collateral channels – lung and heart channels respectively, it is possible to balance the flow of qi in the affected channels and relieve pain. In the standard protocol used in this study, C₁ and C₂ are the control points. C₁ connects the lung channel to the bladder channel, and C₂ connects the heart channel to the gall bladder channel. Function points F₁ and F₄ have an effect on the occipital area directly. Function points F₂ and F₅ affect the cervical region. Function points F₃ and F₆ affect the upper back.

Zang Fu Tong Zhi was first mentioned by Li Yan (李延 in *Yi Xue Ru Men* (医学入门) (Elementary Course for Medicine)²⁴ during the Ming dynasty. The theory was further elaborated by Tang Zong Hai (唐宗海 in *Yi Xue Jing Yi* (医学精义) (A Refined Interpretation of the Medical Classics)²⁵ during Qing dynasty. Dr Wei Jie Yang had applied this system in acupuncture and herbal treatments since 1972 and achieved remarkable results.²²

Zang Fu Tong Zhi is established based on the theory of the opening, closing and pivot nature of the three yang and three yin channels. The three yang channels are *taiyang* (太阳), *shaoyang* (少阳) and *yangming* (阳明). The three yin channels are *taiyin* (太阴), *shaoyin* (少阴) and *jueyin* (厥阴). It is mentioned in *Neijing* and *Lingshu* that '*Taiyang* and *Taiyin* opens, *Shaoyang* and *Shaoyin* pivots, *Yangming* and *Jueyin* closes' (太阳为开, 少阳为枢, 阳明为合, 太阴为开, 少阴为枢, 厥阴为合). Hence by matching the open-close-pivot nature of the three yang channels to the three yin channels, a new pairing system of *Zang Fu Tong Zhi* is established.²²

The same name channel pair matches a hand channel with a foot channel. For example, one can use points in the hand *tai yin* channel to treat an illness in the foot *tai yin* channel. The emphasis is on distal treatment – using the upper body to treat the lower body and vice versa. The internal-external pair matches a yin organ/channel to a yang organ/channel, and its emphasis is on yin-yang balance. In *Zang Fu Tong Zhi*, there is a hand channel and foot channel, and a yin channel and a yang channel in every pair, to reach a balance between hand-foot, upper-lower, *zang-fu*, and yin-yang. This may explain of the therapeutic effect of CMAT from the theory of Chinese medicine.²²

The strength of this study is that it is a randomised, sham-intervention controlled trial. However, due to time and budget constraints, the sample size selected for this study was only 60. The weakness of this study is that there is no sample size estimation and evaluation of the success of the blinding. This study only tested for short-term pain relief, hence the long-term effect cannot be established. It may be possible that data collected on a different trial of different setting or population may produce different results. Therefore, future study is encouraged to further explore the long-term effect of CMAT.

The CMAT seems to have a satisfactory therapeutic effect for patients suffering from neck pain. The findings of this study may help acupuncturists, and other healthcare professionals to discover a convenient yet non-invasive method of pain relief. The application of this method can even be taught to patients or their carers and be applied when necessary at home as part of self-help. This may improve the quality of patient care. CMAT may be considered as a treatment option, in conjunction with other conventional methods.

Clinical Commentary

This research finds that Collateral Meridian Acupressure Therapy (CMAT) seems to have a satisfactory, short-term therapeutic effect for patients suffering from neck pain. CMAT is based on a lesser-known meridian pairing system known as the *Zang Fu Tong Zhi*. CMAT may be considered as a treatment option for neck pain.

References

- Schlossberg E, Morrow S, Llosa AE, Mamary E, Dietrich P, Rempel DM. Upper Extremity Pain and Computer Use Among Engineering Graduate Students. *AM J Ind Med* 2004.
- Craciun T, Fulger V. Cervical Syndrome Treated with Acupuncture: Clinical and Therapeutic Aspects. *AM J Acupuncture* April-June 1977;5(2).
- Fu LM, Li JT, Wu WS. Randomized controlled trials of acupuncture for neck pain: systemic review and meta-analysis. *J Altern Complem Med* 2009;15(2):133-45.
- Zhang H. Cervical Spondylosis: 100 patients Treated with Sliding Cupping. *J Chin Med* October 2000;64:40-1.
- Wang GY, Qu FL. Treatment of 482 Cases of Cervical Spondylopathy by Combining Point-Injection and Needle-Warming via Moxibustion. *J Tradit Chin Med* 2001; 21(1):31-3.
- Xue B, Fan L, Hu LX. Clinical Observation on Cervical Spondylopathy of the Vertebroarterial Type Treated by Electroacupuncture. *J Tradit Chin Med* 2007;27(1):39-42.
- Huang LM. Comparison of the Effects of Electroacupuncture plus Cupping with That of the Electrical Pulse Therapy for Different Types of Cervical Spondylopathy. *J Tradit Chin Med* 2004;24(1):33-5.
- Li J. A Combined Therapy of Cervical Spondylopathy. *J Tradit Chin Med* 2004;24(2):120-1.
- Gu YH. Acupuncture Treatment of Soft Tissue Injury Around Joints. *J Tradit Chin Med* May 1987;24.
- MacPherson H. The Treatment of Neck and Upper Back Pain with Acupuncture. *J Chin Med* January 1992;38.
- Du YZ, Li DJ. A Variant Maneuver of Acupuncture in Treating Cervical Spondylopathy. *J Tradit Chin Med* 2002;22(2):112-4.
- Dong HY, Wang XY, Meng XW, Liu GW. 46 Cases of the Nerve Root Involved Cervical Spondylopathy Treated by Needling the Sitian Points. *J Tradit Chin Med* 2005;25(3):163-5.
- Xuan LH. Cervical Spondylosis Treatment with Abdominal Points. *J Chin Med* October 2002;70:21-8.
- Zhuang LX. 21 Cases of Vertebral Artery Type Cervical Spondylosis Treated With Acupuncture and Moxibustion. *J Tradit Chin Med* 2000;20(4):280-1.
- Wang GM, Cheng XJ, Yan SY, Zhang AH. 40 Cases of Cervical Syndrome of the Vertebral Artery Treated By Triple Puncturing of HouDing Du-19. *J Chin Med* February 2001;65:11-12.
- Li BM, Chai FM, Gao HM. Cervical Spondylopathy Involving the Vertebral Arteries Treated by Body-Acupuncture Combined with Scalp Acupuncture in 72 Cases. *J Tradit Chin Med* 2002;22(3):197-9.
- Ko SC. A Discussion on Experience in Treatment of Cervical Spondylopathy by Distant Point Pressing. *TCM Shanghai Journal of Acupuncture and Moxibustion* 2001;4(6):52-3.
- Wong CS, Kuo CP, Fan YM, Ko SC. Collateral Meridian Therapy Dramatically Attenuates Pain and Improves Functional Activity of a Patient with Complex Regional Pain Syndrome. *Anaesthesia & Analgesia* 2007;104.
- Hoka S, Kanai A, Ko SC, Suzuki A. Collateral Meridian Therapy Alleviates Intractable Pain and Disability in CRPS Patients. *Anesthesiology* 2007;107(A904).
- Lin JA, Wong CS, Lee MS, Ko SC, Chan SM, Chen J, Chen TL. Successful Treatment of Primary Dysmenorrhea by Collateral Meridian Acupressure Therapy. *J Manipulative Physiol Ther* 2010;33(1):70-5.
- Yeh CC, Wu CT, Huh BK, Lee SM, Wong CS. Collateral Meridian Acupressure Therapy Effectively Relieves Postregional Anesthesia/Analgesia Backache. *South Med J* November 2009;102(11):1179-82.
- 杨维杰. 《针灸宝典》第二十一章: 脏腑别通之应用. 美国中医文化中心. 2006年. [Translation: Young WC. *Acupuncture Treasury*. Chapter 21: Extraordinary Connection of Zang Fu. American Chinese Medical Centre; 2012.]
- Young WC, Tao JW. *Lectures on Tung Acupuncture: Therapeutic system*. 3rd ed. CA: American Chinese Medical Centre; 2012.
- Liu CY, Tseng A, Yang S. *Chinese Herbal Formulas: A Comprehensive Guide*. CRC Press Inc 2008.
- The Five Organs Network [webpage on the Internet]. No date [cited 21 May 2012] Available from: <<http://www.itmonline.org/5organs/intro.htm>>.
- 马列光, 张新渝主编.《黄帝内经素问》: 阴阳离合论篇第六. 成都: 四川科学技术出版社. 2009年7月. [Translation: Ma LG, Zhang XY. *Huang Di Nei Jing Su Wen*: Chapter 6. Chengdu: Sichuan Science and Technology Publishing House. 2009 Sept.]
- 马列光, 张新渝主编.《黄帝内经灵枢》: 根结第五. 成都: 四川科学技术出版社. 2009年7月. [Translation: Ma LG, Zhang XY. *Huang Di Nei Jing Ling Shu*: Chapter 5. Chengdu: Sichuan Science and Technology Publishing House. 2009 July.]