The Efficacy of an 8-Hour Hands-on Workshop on Myofascial Pain Syndrome

Siranya Paecharoen MD*,
Wichit Supamethangkura MD*, Pornrawee Peanpadungrat MD*,
Netraya Nimpitakpong MD*, Chuenchom Chueluecha MD*

** Department of Physical Medicine and Rehabilitation, Faculty of Medicine, Thammasat University, Pathumthani, Thailand*

Objective: *The authors aimed to study the efficacy of an 8-hour hands-on workshop on myofascial pain syndrome (MPS) in the head, neck and shoulder areas by the physiatrists.*
Material and Method: *This before-after cohort study enrolled licensed physicians. Twenty physicians participated in the workshop. The control group enrolled 20 other physicians in a 1: 1 ratio with the workshop group. The workshop involved a lecture about MPS, hands-on trigger point palpation and dry needling by an experienced physiatrist. Before and after the 8-hour workshop, participants did a case record form. It consisted of baseline characteristics, 15 MPS-related questions, and the physicians' confidence scale.*
Results: *The score on the 15 questions concerning MPS increased by 4.8±2.86 in the workshop group and by 0.45±1.57 in the control group ($p<0.001$). The scores on the diagnostic and physical examination questions in the workshop group significantly increased ($p<0.001$) while the treatment question score slightly increased ($p = 0.19$). The confidence scores on MPS diagnosis, physical examination, treatment and dry needling significantly increased in the workshop group ($p<0.001$).*
Conclusion: *In the present study, the 8-hour hands-on workshop consisting of an overview of the MPS lecture, trigger point palpation and dry needling helped to improve related knowledge and skills. The participating physicians had higher confidence in diagnosis and treatment of MPS. This 8-hour hands-on workshop model might be developed into a short training course for medical students and general practice physicians.*

Keywords: *Myofascial pain syndrome, Trigger point, Dry needling*

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Myofascial Pain Syndrome (MPS) is more commonly found nowadays compared to the past partly due to the modern lifestyle where computers and mobile devices tend to be overused. This causes prolonged abnormal posture or abnormal ergonomics. MPS can have similar signs and symptoms to many diseases like radiculopathy, tendinitis, tension headache, migraine, etc. leading to a delayed diagnosis or misdiagnosis of MPS. Therefore, MPS patients often do not receive prompt and appropriate treatment.

Myofascial Pain Syndrome is defined as a regional pain syndrome characterized by muscle pain caused by Myofascial trigger point (MTrP)[1,2]. Diagnostic criteria include 1) MTrP found in a palpable taut band of skeletal muscle fibers and 2) pressure stimulation of MTrP can produce pain that the patient recognizes, referred pain, and local twitch response (LTR)[2]. Therefore, manual MTrP and taut band palpation with equal pressure algometry or a surface electromyography is essential for MPS diagnosis[3-6]. Previous research revealed that training of manual MTrP and taut band palpation should be provided for physicians. Untrained physicians have lower interrater reliability than trained ones. A training session has a 3-hour comprehensive lecture on MPS and manual MTrP palpation on live subjects. In addition to training, physicians' experience is also very essential for MPS diagnosis[3,15].

MPS treatments consist of the reduction of physical and psychological perpetuating factors, physical modality, massage, self-stretching, dry and wet needling. Dry needling is an equally effective treatment as physical modality, massage and wet needling[7-9]. It can suddenly relieve pain, relax muscles

Correspondence to:
Paecharoen S, Department of Physical Medicine and Rehabilitation, Faculty of Medicine, Thammasat University, Pathumthani 12120, Thailand.
Phone: +66-2-9269834
E-mail: drsiranya@gmail.com

and improve the overall condition. The effect of dry needling persists for one month[10-12]. Common side effects of dry needling are post-injection soreness, minor bleeding and contusion on the injection side and fainting. A serious side effect is pneumothorax but it is less common. Thus, physicians' training and experience are the most crucial factors to prevent patients from the side effects of dry needling[13,14].

In Thailand, the treatment of Myofascial Pain Syndrome is not taught or trained in the doctor of medicine program but only in the Physical Medicine and Rehabilitation program. Therefore, many doctors may misdiagnose or give an ineffective treatment to MPS patients, resulting in serious side effects. The authors aimed to study the efficacy of the 8-hour hands-on workshop on myofascial pain syndrome (MPS) in the head, neck and shoulder areas by the physiatrists. The workshop involved a lecture about MPS, manual MTrP palpation and hands-on dry needling. The efficacy measurement is a score from both 15 MPS questions and physicians' confidence in diagnosis, physical examination, treatment and dry needling.

Material and Method

This before-after cohort study enrolled licensed physicians, including both general practice and specialist physicians. The training was announced by poster for interested and qualified participants to enroll in. The study group was made up of physicians who participated in the 8-hour myofascial pain syndrome and dry needling training conducted by the physiatrists from the Faculty of Medicine, Thammasat University. Meanwhile, the control group comprised physicians who worked at Thammasat University Hospital. The criteria excluded physicians who did not completely participate in the 8-hour workshop.

This study was approved by the Human Research Ethics Committee of Thammasat University No. 1 (Faculty of Medicine) on March 26, 2015 and registered in the Thai Clinical Trials Registry (TCTR No. 20150804001). Sample size was followed on the number of physicians participating in the training course in a 1: 1 ratio with the control group. Twenty physicians participated in the training course, so 20 more physicians were enrolled in the control group.

In the workshop group, the participants received a case record form prior to the workshop. The case record form was comprised of baseline characteristics, 15 MPS questions, and physicians' confidence scale. The 15 MPS questions were in the multiple-choice format and were divided into diagnosis, physical examination and treatment sections. The post-examination analysis was measured by the level of difficulty (P) and discriminant index (r). The level of difficulty (P) scores were 0 to 0.818 and the discriminant index(r) scores were 0 to 0.5. Physicians' confidence in diagnosis, physical examination, treatment and dry needling were measured by the visual analog scale (VAS 1 to 10). The workshop had a comprehensive lecture on MPS and management. Training on manual MTrP palpation techniques was provided by the physiatrists and each physician examined each of the others. Then, dry needling techniques were demonstrated and each physician again examined the others. After the 8-hour workshop, they redid a case record form. In the control group, the participants did a case record form before and after 8 hours. During the 8-hour training, the control participants conducted a self-examination for MPS, along with routine activities.

Collected data were managed and analyzed using a computer program. Baseline characteristics and descriptive data were presented as frequency, percentage, mean, standard deviation and median. Categorical variables were compared by using a Chi-square test or Fisher's exact test. A paired t-test or paired signed-rank test was used for comparing continuous variables within the group. An unpaired t-test or a Mann Whitney U test was used for comparing continuous variables between groups. A two-sided or one-sided test, as appropriate, was used for all comparisons and a *p*-value of 0.05 or less was considered to be statistically significant.

Results

Forty persons participated in this study. Twenty persons attended the workshop and 20 persons were assigned as the control group. The mean age was 31 years old in the workshop group and 28 years old in the control group. Participants were 50% male in the workshop group and 55% male in the control group. The majority of participants in both groups were general practice physicians (workshop group: 60% and control group: 75%). The rest of the participants were medical specialists, who were composed of two groups: rehabilitation and non-rehabilitation physicians. Rehabilitation physicians accounted for 30% of the workshop group and 0% of the control group while non-rehabilitation ones accounted for 10% of the workshop group and 25% of the control group. The average work experience of the physicians was 4.4 ± 5.7 years in the workshop group and 2.8 ± 1.7 years in the

control group. Both workshop and control groups had diagnosed patients with myofascial pain syndrome (100% and 95% respectively). 30% of the workshop group and 60% of the control group joined in the previous myofascial pain syndrome workshop. 60% of the workshop group and 30% of the control group implemented the dry needling technique. The baseline characteristics of participants are shown in Table 1.

The participants responded to15 multiple choice questions concerning diagnosis, physical examination, and treatment of myofascial pain syndrome. Before and after scores on all 15 questions were significantly different in the workshop group (p<0.001). Subgroup analysis as diagnostic, physical examination and treatment parts showed a significant difference between before and after scores in the workshop group (p<0.001, <0.001, 0.03). In the control group, the total before and after scores as well as scores on diagnostic, physical examination and treatment parts were not significantly different (p = 0.39, 0.84, 0.43, 0.26). Before and after MCQ scores in the workshop and control groups are shown in Table 2.

The mean difference of scores (after score-before score) was 4.8±2.86 in the workshop group and 0.45±1.57 in the control group, which showed a significant difference between the two groups (p<0.001).

Table 1. Baseline characteristics of participants

Baseline characteristics	Workshop group, n (%)	Control group, n (%)	*p*-value
Age, mean (SD)	31 (±6.75)	28 (±2.83)	0.35
Sex			1.00
Male	10 (50)	11 (55)	
Female	10 (50)	9 (45)	
Medical specialist			0.02
General practice	12 (60)	15 (75)	
Non-rehabilitation	2 (10)	5 (25)	
Rehabilitation	6 (30)	0 (0)	
Working time, mean (SD)	4.4 (±5.7)	2.8 (±1.7)	0.73
Previous MPS diagnosis			
Yes	20 (100)	19 (95)	1.00
No	0 (0)	1 (5)	
Previous MPS workshop			0.11
Yes	6 (30)	12 (60)	
No	14 (70)	8 (40)	
Previous dry needling			0.11
Yes	12 (60)	6 (30)	
No	8 (40)	14 (70)	

Chi-square test or Fisher's exact test

Table 2. MCQ scores in workshop and control groups

MCQ score	Workshop group			Control group		
	Before score mean ± SD	After score mean ± SD	*p*-value	Before score mean ± SD	After score mean ± SD	*p*-value
Total score	7.95±2.93	12.75±1.33	< 0.001	7.05±2.14	7.5±2.50	0.39
Diagnostic score	3.25±1.45	5.15±0.93	< 0.001	2.8±1.11	2.9±0.85	0.84
Physical examination score	2.55±1.47	4.95±0.76	< 0.001	2.45±1.54	2.65±1.53	0.43
Treatment score	2.15±0.93	2.65±0.59	0.03	1.8±0.77	1.95±0.83	0.26

Paired t-test or Paired signed-rank test

Participants in the workshop group were divided into general practice, non-rehabilitation and rehabilitation physicians. General practice physicians had a mean difference of scores of 6±2.86. Non-rehabilitation and rehabilitation physicians had a mean difference of 4±2.83 and 2.67±1.51, respectively. Subgroup analysis showed mean differences of scores in diagnostic and physical examination parts were significantly different (p<0.001, <0.001) but the treatment part was not significantly different (p = 0.19). The MCQ difference scores between the workshop and control groups are shown in Table 3.

The confidence scores in diagnosis, physical examination, treatment and dry needling for myofascial pain syndrome were measured by the visual analog scale (VAS) 1 to 10. Before and after confidence scores on all 4 parts were significantly different in the workshop group (p<0.001, <0.001, <0.001, <0.001 respectively) but were not significantly different in the control group. The confidence scores by the visual analog scale in the workshop and control groups are shown in Table 4.

In diagnosis, physical examination, treatment and dry needling parts, mean differences of confidence scores (after score-before score) were 2.8±1.91, 3.25±1.65, 2.85±1.42, 3.65±2.25 respectively in the workshop group and 0±0.65, 0±0.73, -0.3±0.73, 0.4±1.23 respectively in the control group. The mean differences of confidence scores in all 4 parts were significantly different between workshop and control groups (p<0.001, <0.001, <0.001, <0.001 respectively).The mean differences of confidence scores between workshop and control groups are shown in Table 5.

Discussion

The present study showed no significant difference of baseline characteristics between workshop and control groups, except medical specialists (p = 0.024). The workshop group had six rehabilitation physicians (30%) while the control group had none. The variable factor on the expertise of physicians may cause a bias in the study's result. Most of workshop participants did not receive training on MPS (70%) but they did the dry needling technique. In contrary, most of the control participants were trained (60%) but they did not practice dry needling. It could be assumed that the previous training session of the control group did not practice dry needling or they did not have

Table 3. MCQ difference scores between workshop and control groups

MCQ score	Workshop group	Control group	*p*-value
	After score - before score Mean ± SD	After score - before score Mean ± SD	
Total score	4.80±2.86	0.45±1.57	<0.001
Diagnostic score	1.90±1.48	0.10±0.97	<0.001
Physical examination score	2.40±1.50	0.20±0.89	<0.001
Treatment score	0.50±0.89	0.15±0.59	0.19

Unpaired t-test or Mann Whitney U test

Table 4. Confidence scores by visual analog scale in workshop and control groups

Confident scores (VAS)	Workshop group			Control group		
	Before score mean ± SD	After score mean ± SD	*p*-value	Before score mean±SD	After score mean±SD	*p*-value
Diagnosis	5.70±2.32	8.50±0.95	<0.001	5.85±2.18	5.85±2.37	1.00
Physical examination	5.20±2.17	8.45±0.99	<0.001	5.75±2.12	5.75±2.24	1.00
Treatment	5.25±2.22	8.10±1.29	<0.001	5.65±1.95	5.35±2.06	0.09
Dry needling	4.10±2.86	7.75±1.41	<0.001	2.75±2.45	3.15±2.56	0.22

Paired t-test or Paired signed-rank test

Table 5. Differences of confidence scores between workshop and control groups

Confidence scores (VAS)	Workshop group	Control group	*p*-value
	After score - before score mean ± SD	After score - before score mean ± SD	
Diagnosis	2.80±1.91	0±0.65	<0.001
Physical examination	3.25±1.65	0±0.73	<0.001
Treatment	2.85±1.42	-0.3±0.73	<0.001
Dry needling	3.65±2.25	0.4±1.23	<0.001

Unpaired t-test or Mann Whitney U test

confidence to do it. They chose other treatment options for MPS. Moreover, they might have known about the caution and side effects of dry needling if performed without proficiency.

Workshop participants were lectured about clinical signs & symptoms, physical examination and treatment of myofascial pain syndrome. The hands-on 8-hour workshop about palpation and dry needling of MTrP was controlled under experienced physiatrists. The scores of workshop participants significantly increased after the workshop, with a mean of 4.8, more than the scores of control participants which averaged 0.45 (p<0.001). The majority of control participants were previously trained on MPS but details on training experiences and the number of training hours could not be clearly specified.Workshop participants were divided into general practice, non-rehabilitation and rehabilitation physicians. The after-workshop scores increased in general practice (6±2.86), non-rehabilitation (4±2.83) and rehabilitation physicians (2.67±1.51). The workshop was more useful for general practice physicians than non-rehabilitation and rehabilitation physicians, based on the scores. In other words, rehabilitation physicians were trained and had experiences in curing MPS patients. Therefore, this training might only recap the knowledge of rehabilitation physicians. In subgroup analysis, diagnostic and physical examination parts, the increase in the workshop participants' scores was significantly higher than that of the control participants. The workshop participants got higher scores on physical examination questions than diagnostic questions (with a mean of 2.4 and 1.9 respectively) because they had a chance to practice MTrP palpation on live subjects. They were lectured on a palpable technique, MTrP location and pattern of referred pain. Like previous study of Gerwin and Hsiech, it showed that MPS training on live subjects helped increase interrater reliability in the diagnosis of MTrP[3,15]. The treatment question score increased in the workshop group (0.5) but not significantly. It could be concluded that dry needling was practiced more than other MPS treatments. The other hands-on MPS treatment options will be further emphasized in the next workshop.

After the workshop, the participants' confidence in diagnosis, physical examination, treatment and dry needling for myofascial pain syndrome was higher than before they attended the workshop. The increases in confidence between the workshop and control participants were significantly different. Although the majority of control participants were previously trained on MPS, their scores and confidence were lower than those of the workshop participants. It could be concluded that this hands-on workshop was effective and advantageous for the physicians.

The majority of workshop participants (95%) mentioned that workshop contents and duration were appropriate. The training duration of 8 hours was suitable for the present study, which only trained in the head, neck and shoulder areas. This training period was longer than the previous study (nearly 3 hours) because this study had a dry needling session[3,15]. They appreciated the training provided by the physiatrists and would like to learn more about related topics, such as myofascial pain syndrome in lower back & lower extremities, stroke, and fibromyalgia.

Conclusion

In this study, the 8-hour hands-on workshop consisted of a comprehensive lecture on MPS, trigger point palpation and dry needling which improved knowledge and skills. The participating physicians developed increased confidence in the diagnosis and treatment of MPS, especially among the general practice physicians. This 8-hour hands-on workshop model

might be developed into a short training course for medical students and general practice physicians.

What is already known on this topic?

The key of MPS diagnosis is finding the MTrP. MPS-experienced physicians give credence to the importance of specific training and clinical experience in trigger point palpation.

What this study adds?

This present study shows the 8-hour hands-on workshop consisting of a comprehensive lecture on MPS, trigger point palpation and dry needling helped improve physicians' knowledge, skills and confidence more than an MPS lecture alone.

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Potential conflicts of interest

None.

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ประสิทธิภาพของการอบรมเชิงปฏิบัติการเรื่องอาการปวดกล้ามเนื้อมัยโอฟาลเชี่ยลเพนซินโดรม ในระยะเวลา 8 ชั่วโมง

ศิรัญญา แพเจริญ, วิชิต ศุภเมธางกูร, พรระวี เพียรผดุงรัชต์, เนตรยา นิ่มพิทักษ์พงศ์, ชื่นชม ชื่อลือชา

วัตถุประสงค์: เพื่อศึกษาถึงประสิทธิภาพของการอบรมเชิงปฏิบัติการเรื่องอาการปวดกล้ามเนื้อมัยโอฟาลเชี่ยลเพนซินโดรมในระยะเวลา 8 ชั่วโมง

วัสดุและวิธีการ: การศึกษาแบบไปข้างหน้า เปรียบเทียบก่อนและหลัง โดยมีกลุ่มควบคุมทำการศึกษาในกลุ่มแพทย์ที่มีใบอนุญาตประกอบโรคศิลป์ที่เข้าร่วมการอบรมเรื่องอาการปวดกล้ามเนื้อมัยโอฟาลเชี่ยลเพนซินโดรม และฝึกปฏิบัติการแทงเข็มเปล่าโดยแพทย์เวชศาสตร์ฟื้นฟูเป็นระยะเวลา 8 ชั่วโมง จำนวน 20 คน และกลุ่มควบคุมรับแพทย์ ที่ไม่ได้เข้าร่วมการอบรม จำนวน 20 คน โดยคิดในอัตราส่วน 1: 1 การอบรมครั้งนี้ประกอบด้วยการบรรยายเนื้อหาเรื่องอาการปวดกล้ามเนื้อมัยโอฟาลเชี่ยลเพนซินโดรม การฝึกปฏิบัติคลำหาจุดกดเจ็บและการฝึกปฏิบัติการแทงเข็มเปล่า (dry needling) ภายใต้การดูแลของแพทย์เวชศาสตร์ฟื้นฟู โดยแพทย์จะได้รับแบบสอบถามก่อนและหลัง 8 ชั่วโมง ซึ่งประกอบด้วยข้อมูลพื้นฐาน คำถามในเรื่องของอาการปวดกล้ามเนื้อมัยโอฟาลเชี่ยลเพนซินโดรมจำนวน 15 ข้อ และการให้คะแนนในหัวข้อเรื่องความมั่นใจของแพทย์ในการวินิจฉัย ตรวจร่างกาย การรักษาและการแทงเข็มเปล่า ในผู้ป่วยอาการปวดกล้ามเนื้อมัยโอฟาลเชี่ยลเพนซินโดรม

ผลการศึกษา: คะแนนในส่วนของคำถามเรื่องของอาการปวดกล้ามเนื้อมัยโอฟาลเชี่ยลเพนซินโดรมจำนวน 15 ข้อ พบว่ากลุ่มแพทย์เข้าร่วมการอบรมมีคะแนนเพิ่มขึ้น 4.8±2.86 คะแนน และกลุ่มแพทย์ควบคุม มีคะแนนเพิ่มขึ้น 0.45±1.57 คะแนน ซึ่งคะแนนที่เพิ่มขึ้นมีความแตกต่างกันอย่างมีนัยสำคัญทางสถิติ ($p<0.001$) เมื่อแบ่งตามหัวข้อ ได้แก่ คำถามเรื่องการวินิจฉัยและการตรวจร่างกาย พบว่ากลุ่มแพทย์เข้าร่วมการอบรมมีคะแนนเพิ่มขึ้นอย่างมีนัยสำคัญทางสถิติ ($p<0.001$) ซึ่งแตกต่างจากหัวข้อ คำถามเรื่องการดูแลรักษา ($p = 0.19$) และพบว่าแพทย์เข้าร่วมการอบรม มีความมั่นใจในการวินิจฉัยตรวจร่างกายการรักษาและการแทงเข็มเปล่า ในผู้ป่วยอาการปวดกล้ามเนื้อมัยโอฟาลเชี่ยลเพนซินโดรมเพิ่มมากขึ้นอย่างมีนัยสำคัญทางสถิติ ($p<0.001$)

สรุป: การอบรมเชิงปฏิบัติการเรื่องอาการปวดกล้ามเนื้อมัยโอฟาลเชี่ยลเพนซินโดรมในระยะเวลา 8 ชั่วโมง ที่มีลักษณะการอบรมแบบบรรยายและการฝึกปฏิบัติ สามารถเพิ่มความรู้ ความชำนาญ และความมั่นใจ ด้านการวินิจฉัยตรวจร่างกาย การรักษาและการแทงเข็มเปล่าให้กับแพทย์เข้าร่วมการอบรมได้อย่างมีประสิทธิภาพ โดยเฉพาะกลุ่มแพทย์เวชปฏิบัติทั่วไป ดังนั้นการอบรมเชิงปฏิบัติการในครั้งนี้สามารถเป็นต้นแบบในการจัดการเรียนการสอนให้นักศึกษาแพทย์และแพทย์เวชปฏิบัติได้