

Original Article

## An Analysis of Recent Oriental Medical Research on Dysmenorrhea

Kang-In Park<sup>1</sup>, Jin-Woo Kim<sup>1</sup>, Kyoung-Sun Park<sup>1</sup>, Jin-Moo Lee<sup>1,2</sup>

<sup>1</sup>Department of Gynecology, Korean Medicine Hospital, Kyung Hee University at Gangdong

<sup>2</sup>Department of Gynecology, College of Korean Medicine, Kyung Hee University

**Objectives:** This study aimed to evaluate oriental medical research on dysmenorrhea published within 10 years to analyze the trends of study on dysmenorrhea at home and abroad for progress in future clinical research.

**Methods & Results:** Publication research was carried out on several online database systems using keywords like 'dysmenorrhea', 'traditional medicine', 'herb', 'acupuncture', 'CAM', 'complementary and alternative medicine', 'moxibustion' within 10 years(2002-2012). 32 Korean journal articles and 29 oversea journal articles were selected.

**Conclusions:** This study concludes that more well-designed randomized-controlled studies and diverse approaches are necessary to make accumulation of evidence on oriental medical therapy of dysmenorrhea.

**Key Words :** Review study, dysmenorrhea, Oriental medicine, CAM, Korean medicine, outcome measures

### Introduction

Dysmenorrhea is a medical condition of pain around the pubic bone and in the lower abdomen during menstruation. It is one of the most frequent gynecological disease which 50% of women of childbearing age suffer<sup>1</sup>).

Western medicine uses symptomatic treatment (non-steroidal anti-inflammatory drugs, NSAIDs and prostaglandin synthesis inhibitors) for dysmenorrhea. These are not appropriate treatments for long time symptoms because these are just temporarily effective, and may cause side effects<sup>2</sup>). Also, hormone therapy, which is widely used lately, causes unwanted menopausal symptoms (sweating, hot flush,

vaginal dryness, dyspareunia, breast reduction, decrease of sexual desire, etc.) compared with unsatisfactory results<sup>3</sup>).

There is no radical cure for dysmenorrhea in western medicine. In contrast, Oriental medical treatment such as acupuncture, moxibustion, or herbal medicine are known for curing dysmenorrhea radically, noninvasively, and safely. Empirically, the value of Oriental medicine for dysmenorrhea has been verified by accumulation of case studies and clinical research. Also, Oriental medicine can provide more satisfactory results for patients because it uses different therapies for each patient by differentiation of syndromes such as stagnation of Ki and stasis of blood, cold-damp stagnation, deficiency of both Ki

• Received : 17 October 2013

• Revised : 4 December 2013

• Accepted : 4 December 2013

• Corresponding Author : Jin-Moo Lee

Department of Korean Gynecology, College of Korean Medicine, Kyung Hee University, 26 Kyungheedae-ro, Dongdaemun-gu, Seoul 130-701, Republic of Korea

Tel : +82-2-440-6230, Fax : +82-2-440-6296, Email : Hanbang9597@hanmail.net

and blood, deficiency of the liver and kidneys<sup>1)</sup>.

So, for the progress of Korean medicine on dysmenorrhea, various studies and accumulation of clinical evidence are necessary, but to this time, systemic review studies on dysmenorrhea have not been conducted diversely, so this study aimed to evaluate Oriental medical research on dysmenorrhea published within 10 years to analyze the trends of study on dysmenorrhea at home and abroad for progress in future clinical research.

## Methods

### 1. Data collection

All papers published from 2002 to 2012 were collected from the medical databases using keywords like 'dysmenorrhea', 'traditional medicine', 'herb', 'acupuncture', 'CAM', 'complementary and alternative medicine', 'moxibustion'. For Korean papers, KISS (<http://kiss.kstudy.com>), Korean Traditional Knowledge Portal (<http://www.koreantk.com>), Journal of Korean Medicine (<http://jkom.org>) and affiliated journal sites were used. For overseas journals, Pubmed (<http://www.ncbi.nlm.nih.gov/PubMed>) was used. 32 Korean journal articles and 29 overseas journal articles were selected.

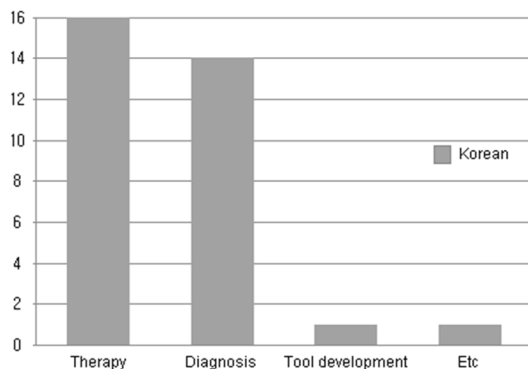


Fig. 1. Comparison of field on 32 journal articles in Korea

### 2. Study design

#### 1) Classification by field

Journals were classified into four categories, 'Therapy', 'Diagnosis', 'Tool development', 'Other'.

#### 2) Classification by typology

Journals were classified into 7 categories, 'Case report', 'Clinical research', 'Sectional study', 'Systemic review study', 'Experimental study', 'Assessment', 'Other'.

### 3. Classification by evaluation tool

Journals which used evaluation tools were classified by that.

### 4. Classification by therapy

Journals were classified by type of therapy, meridian point, and herbal medicine.

## Results

### 1. Classification by field (Fig 1,2)

In Korean journals, there were 16 therapy, 14 diagnosis, 1 tool development, and 1 other journals (Fig 1). But among overseas journals, there were only 29 therapy journals (Fig 2).

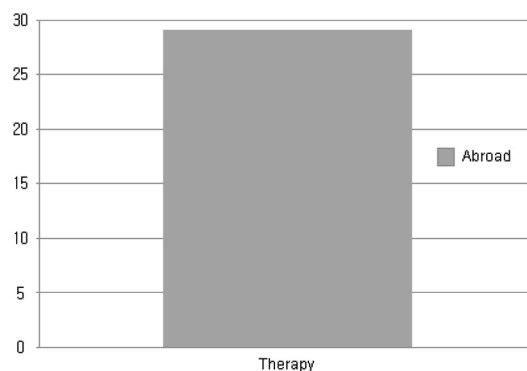


Fig. 2. Comparison of field on 29 journal articles abroad

**Table 1.** Classification of Journal Articles in Korea

Method	Classification
Clinical study: 12 articles	Herb medicine: 4 articles Gyejibongnyeong-hwan, Jujadanggui-hwan, Hyunburikyung-tang (3 times) Gwakhyangjeonggi-san, Yukmijihwang-tang, Chiljehyangbu-hwan (1 time)
	by Intervention Acupuncture and moxibustion: 5 1) Acupuncture: SP6 (3), LI4,LR3,CV4 (2), Saam Acupuncture Sojangjungkyuk (1) 2) Auricular-acupuncture: Uterus, Sympathetic nerve, Subcortex, Endocrine (2) 3) Electro-acupuncture: CV6,CV4 (1) 4) Moxibustion: CV6, CV4 (2), CV3, SP6, GB39 (1)
	The others: 1
	by Method Non-randomized: 6 articles Randomized-Controlled Trial: 5 Randomized-Controlled and Double Blinded: 1
	by Outcome measures 1) VAS: 12 articles 2) MVRs: 3 3) VRS: 1 4) Patient's Global Assessment: 1 5) DIT: 2
Sectional study (cross-sectional): 12	1) Body Mass Index (BMI): 3 articles 2) HRV: 3 3) MMPI, SCL-90-R, STAXI-K: 3 4) Deficiency and Excess Patterns: 1 5) Menstrual Tendency: 1 6) Electroacupuncture according to voll (EAV): 1
Case study: 2	1) Gamisoyo-san: 1 article 2) Gwakhyangjeonggi-san: 1
Review study	3 articles
The others	3 articles

**Table 2.** Classification of Journal Articles Abroad

Method	Classification
Clinical study: 21 articles	Herb medicine: 6 articles Samul-tang (Siwu-tang) (2 times), Gyejibongnyeong-hwandanggui, jakyak, hyunhosaek capsule, chiljehyangbu-hwan, others (Dangguijakyak-san, Gyejibongnyeong-hwan, etc.) (1)
	by Intervention Acupuncture and moxibustion: 13 1) Acupuncture: SP6 (5), LI4 (3), LR3 (2), SP4, ST29, BL32, SP8, CV3, ST36, EX-B8 (1) 2) Auricular-acupuncture: Spirit gate, Uterus, Endocrine, Subcortex, Sympathetic nerve, Kidneys (1) 3) Electro-acupuncture: SP6 (2) 4) Moxibustion: CV8 (2), CV4 (1)
	Acupuncture combined with spinal <i>tui na</i> : 1 article Acupuncture massage: 1 article

Method	Classification	
	by Method	Non-randomized: 0 articles
		Randomized-Controlled and Double Blinded Trial: 4
		Randomized-Controlled and Placebo-Controlled: 6
		Multi center Randomized-Controlled: 2
	by Outcome measures	1) VAS: 11 articles
		2) MVRS: 1
		3) VRS: 3
		4) NRS: 2
		5) HRV: 2
		6) SF-MPQ, SF-MDQ: 1
7) CMSS, CRSS: 1		
8) 4-point Scale: 1		
9) Blood Stagnation Scale: 1		
10) Objective measures		
Experimental study: 3	1) objective: mouse intervention: Radix Angelica, Rhizoma Chuanxiong	
	2) objective: rat intervention: acupuncture	
	3) objective: rat uterine smooth muscle in vitro intervention: Onkyung-tang	
Case study	1 article	
Review study	4 articles	

## 2. Classification by typology (Fig 3,4) (Table 1,2)

In Korean journals, there were 2 case reports, 12 clinical research, 12 sectional study, 3 systemic review study, 1 assessment, and 2 other journals (Fig3). Clinical research journals included 6 RCT (Randomized-Controlled Trial) and 6 non-RCTs. In overseas journals, there were 1 case report, 21 clinical research, 4 systemic review study, and 3 experimental study journals (Fig 4). There were no sectional study, and clinical research journals were all RCTs.

## 3. Classification by evaluation tool (Fig 5,6) (Table 3,4)

In Korean journals, all the 12 clinical research

journals selected VAS (Visual Analogue Scale). 1 journal selected VRS (Verbal Rating Scale), 3 journals selected MVRS (Multidimensional Verbal Rating Scale), and 1 journal selected PGA (Patient's Global Assessment). 2 journals selected DITI (Digital Infrared Thermal Imaging). VAS, VRS, MVRS are subjective evaluation tools, while DITI is an objective evaluation tool.

In overseas journals, more various subjective evaluation questionnaires like SF-MPQ (Short-form McGill Pain Questionnaire), SF-MDQ (Short-form Menstrual Distress Questionnaire), CMSS (Cox Menstrual Symptom Scale), CRSS (Cox Retrospective Symptom Scale), 4-point pain scale, and Blood stagnation scale were used. Objective evaluation tools were also used more variously such as

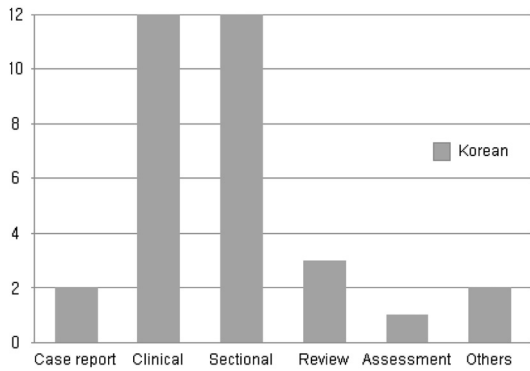


Fig. 3. Comparison of typology on 32 journal articles in Korea

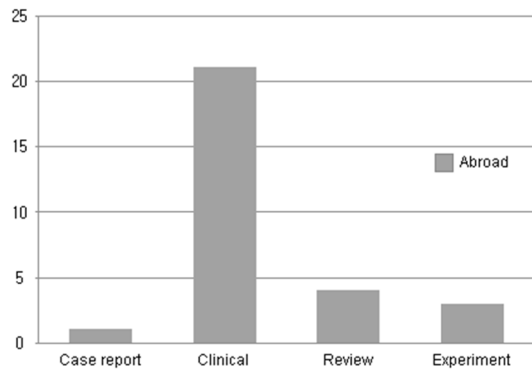
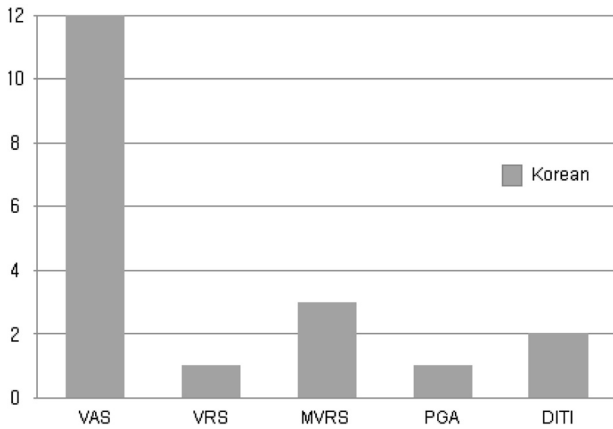
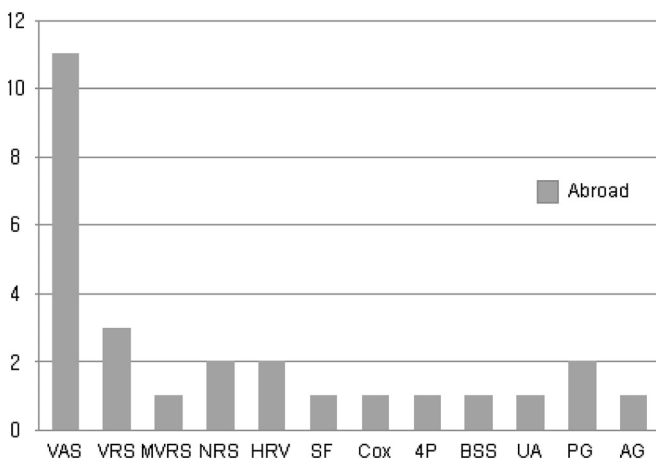


Fig. 4. Comparison of typology on 29 journal articles abroad



\*VAS: Visual Analogue Scale  
 \*VRS: Verbal Rating Scale  
 \*MVRS: Multidimensional Verbal Rating Scale  
 \*PGA: Patient's Global Assessment  
 \*DITI: Digital Infrared Thermal Imaging

Fig. 5. Comparison of evaluation tool on 12 clinical journal articles in Korea



\*VAS: Visual Analogue Scale  
 \*VRS: Verbal Rating Scale  
 \*MVRS: Multidimensional Verbal Rating Scale  
 \*NRS: Numerical Rating Scale  
 \*HRV: Heart Rate Variability  
 \*SF: SF-MPQ (Short-form McGill Pain Questionnaire), SF-MDQ (Short-form Menstrual Distress Questionnaire)  
 \*Cox: CMSS (Cox Menstrual Symptom Scale), CRSS (Cox Retrospective Symptom Scale)  
 \*4P: 4-Point Scale  
 \*BSS: Blood Stagnation Scale  
 \*UA: Uterine Arteries  
 \*PG: Prostaglandin Level  
 \*AG: Proportion of participants using analgesics

Fig. 6. Comparison of evaluation tool on 21 clinical journal articles abroad

**Table 3.** Summarized Information of Clinical studies in Korea

Intervention	Subjects	Methods	Outcome measurements
1. Clinical study on the effect of Gyejibongnyeong capsule in the treatment of primary dysmenorrhea <sup>11)</sup> .			
Gyejibongnyeong capsule	N = 10	A RCT	1) VAS 2) Patient's Global Assessment
2. A clinical study on the effect of aroma ceramic moxibustion for primary dysmenorrhea <sup>12)</sup> .			
Aroma ceramic moxibustion	N = 52	A RCT double-blind Treatment group = 25 (Aroma ceramic moxibustion) Control group = 27 (Aroma moxibustion)	1) VAS 2) DITI
3. Clinical study on the efficacy Jujadanggungui-hwan for dysmenorrhea <sup>13)</sup> .			
Jujadanggungui-hwan	N = 24	Non-randomized	1) VAS 2) Area of pain 3) Pain degree by menstrual cycle 4) Accompanied symptom (menorrhagia, vomiting, breast pain, headache, diarrhea, dizziness, dyspepsia, stress)
4. A clinical study on the effect of dysmenorrhea clinic for female college students <sup>14)</sup> .			
1. Herb-medication 2. Moxibustion 3. Acupuncture	N = 26	Non-randomized	1) VAS 2) MVRs
5. The evaluation of usefulness for far-infrared radiating under inner-wear on dysmenorrhea <sup>15)</sup> .			
Infrared radiating inner-wear	N = 121	A RCT	1) VAS
6. A clinical study on the efficacy of electrostimulation on acupuncture loci in the treatment of dysmenorrhea <sup>16)</sup> .			
Electroacupuncture	N = 20	A RCT Primary group=12 Secondary group=8	1) VAS
7. Effect of hominis placenta herbal acupuncture on dysmenorrhea <sup>5)</sup> .			
Homonis placenta herbal acupuncture	N = 14	Non-randomized Treatment group (Herbal acupuncture) Control group (Normal saline injection)	1) VAS 2) DITI
8. A clinical study on the effect of auricular acupuncture treatment for adolescent dysmenorrheic women <sup>17)</sup> .			
Acupuncture (Auricular)	N = 25	Non-randomized	1) VAS
9. A clinical study on the effect of immediate decrease of pain for acupuncture treatment in adolescent primary dysmenorrheic patients <sup>18)</sup> .			
Acupuncture	N = 30	Non-randomized	1) VAS
10. Clinical study on the efficacy and safety of Chiljehyangbuhwan in the treatment of dysmenorrhea <sup>19)</sup> .			
Chiljehyangbu-hwan	N = 50	A RCT	1) VAS 2) VRS 3) MVRs
11. A clinical study on the effect of crossing over treatment of acupuncture and herbal medication for primary dysmenorrhea <sup>20)</sup> .			
1. Acupuncture 2. Herb-medication	N = 17	A RCT	1) VAS
12. Clinical efficacy of Hyunburikyungtang-gagam for dysmenorrhea caused qi-stagnation and blood clots <sup>21)</sup> .			
Hyunburikyung-tang	N = 47	Non-randomized Primary group = 22 Secondary group = 25	1) VAS 2) MVRs

**Table 4.** Summarized Information of Clinical studies Abroad

Intervention	Subjects	Methods	Outcome measurements
1. A randomised placebo-controlled trial of a traditional Chinese herbal formula in the treatment of primary dysmenorrhoea <sup>22)</sup> .			
Siwu-tang	N = 78	A RCT Placebo-controlled Double-blinded	1) VAS 2) VRS 3) 4-point pain scale (no pain, mild pain, moderate pain, severe pain) 4) Adverse reactions (BUN, creatinine, AST, ALT, TIBC)
2. A traditional Chinese herbal medicine used to treat dysmenorrhea among Taiwanese women <sup>23)</sup> .			
Siwu-tang	N = 49	A RCT Treatment group = 24 Control group = 25	1) VAS
3. Acupuncture to treat primary dysmenorrhea in women: a randomized controlled trial <sup>24)</sup> .			
Acupuncture (SP4, ST29, BI32, SP8, SP6)	N = 92	A RCT Placebo-controlled Acupuncture group = 46 Placebo needle = 46	1) VAS 2) Questionnaire
4. Effects of Gyejibongnyeong-hwan on dysmenorrhea caused by blood stagnation: study protocol for a randomized controlled trial <sup>25)</sup> .			
Gyejibongnyeong-hwan	N=100	A RCT, Multi-center Placebo-controlled Double-blinded Treatment group=50 Placebo group=50	1) VAS 2) Blood stagnation scale 3) Short form McGill pain questionnaire 4) Cox Menstrual symptom scale 5) HRV
5. Immediate effect of acupuncture at Sanyinjiao (SP6) and Xuanzhong (GB39) on uterine arterial blood flow in primary dysmenorrhoea <sup>26)</sup> .			
Acupuncture (SP6)	N = 66	A RCT Treatment group = 32 (SP6) Control group = 34 (GB39)	1) PI (Pulsatility Index) 2) RI (Resistance Index) 3) Ratio of systolic peak/diastolic peak in uterine arteries
6. Randomized controlled trial assessing a traditional Chinese medicine remedy in the treatment of primary dysmenorrhoea <sup>27)</sup> .			
Chinese medicine capsule (Danggui, Jakyak, Hyunhosaeck)	N = 36	A RCT Placebo-controlled Double-blind Treatment group = 17 Placebo group = 19	1) Total pain score 2) Maximal pain score
7. Clinical efficacy of Kampo medicine (Japanese traditional herbal medicine) in the treatment of primary dysmenorrhoea <sup>28)</sup> .			
Kampo medicine (14 Dangguijakyak-san, 11 Gyejibongnyeong-hwan, etc.)	N = 108	A RCT	1) VAS by grouping Level 0: no abdominal pain Level 1: abdominal pain with no requirement of NSAIDS Level 2: abdominal pain with no daily activity disturbances with use of NSAIDS Level 3: pain menstruation which required absenteeism even with use of NSAIDS
8. Does Traditional Chinese Medicine pattern affect acupoint specific effect? Analysis of data from a multicenter, randomized, controlled trial for primary dysmenorrhoea <sup>29)</sup> .			
Electroacupuncture (SP6)	N = 501	A RCT, Multi-center 1) cold-damp stagnation SP6 group = 53 Non-acupoint group = 59 GB39 group = 72 2) Ki and blood stagnation SP6 group = 30	1) VAS

Intervention	Subjects	Methods	Outcome measurements
		Non-acupoint group = 27 GB39 group = 27 3) deficiency of Ki and blood SP6 group = 18 Non-acupoint group = 17 GB39 group = 17	
9. Therapeutic effects of Chiljehyangbu-hwan on primary dysmenorrhea: A randomized, double blind, placebo-controlled study <sup>30)</sup> .			
Chiljehyangbu-hwan	N = 100	A RCT, Placebo-controlled Double blind Treatment group = 24 Placebo group = 17	1) VAS 2) VRS 3) MVRS
10. Acupuncture at Siguan points for treatment of primary dysmenorrhea <sup>31)</sup> .			
Acupuncture (LI4, LR3)	N = 180	A RCT Group A = 60 (LI4, LR3) Group B = 60 (SP6, BL32) Group C = 60 (oral pill)	1) Hemorrhological index 2) Prostaglandin level
11. Acupuncture combined with spinal <i>tui na</i> for treatment of primary dysmenorrhea in 30 cases <sup>32)</sup> .			
Acupuncture combined with spinal tuina	N = 60	A RCT Treatment group = 30 (acupuncture combined with spinal <i>tui na</i> ) Control group = 30 (acupuncture)	1) The total effective rate
12. Acupuncture in patients with dysmenorrhea: a randomized study on clinical effectiveness and cost-effectiveness in usual care <sup>33)</sup> .			
Acupuncture	N = 201	A RCT Treatment group (Acupuncture) Control group (No acupuncture)	1) NRS
13. Clinical observation on treatment of primary dysmenorrhea with acupuncture and massage <sup>34)</sup> .			
Acupuncture massage	N = 90	A RCT Treatment group = 45 (Acupuncture massage) Control group = 45 (Somiton tablet)	1) NRS 2) Prostaglandin level
14. Effect of acupuncture on heart rate variability in primary dysmenorrheic women <sup>35)</sup> .			
Acupuncture (LI4, SP6)	N = 38	A RCT Treatment group : acupuncture Control group : sham acupuncture	1) HRV: LF/HF ratio→ANS activity
15. Effects of SP6 acupressure on pain and menstrual distress in young women with dysmenorrhea <sup>36)</sup> .			
Acupuncture (SP6)	N = 40	A RCT Treatment group = 19 (acupuncture) Control group = 21 (relaxing)	1) VAS 2) SF-MPQ 3) SF-MDQ



Intervention	Subjects	Methods	Outcome measurements
16. Efficacy observation of primary dysmenorrhea treated with isolated-herbal moxibustion on Shenque (CV 8) <sup>37)</sup> .			
Moxibustion (CV8)	N = 102	A RCT Treatment group = 51 (moxibustion) Western group = 51 (analgesics)	1) 1. Cured 2. Effective markedly 3. Effective 4. Fail
17. Immediate analgesia effect of single point acupuncture in primary dysmenorrhea: a randomized controlled trial <sup>38)</sup> .			
Electroacupuncture (SP6)	N = 194	A RCT Acupoint group = 50 (real-SP6) Unrelated acupoint = 50 (GB39) Nonacupoint = 46 No acupuncture = 48 (sham-SP6)	1) VAS 2) RSS (Cox Retrospective symptom scale) 3) VRS 4) Pain total time 5) Proportion of participants using analgesics
18. Laser needle acupuncture in women with dysmenorrhea: a randomised controlled double blind pilot trial <sup>39)</sup> .			
Laser needle acupuncture (non-invasive) (both SP6, LI4, LR3) (right CV3, ST36)	N = 48	A RCT Real laser acupuncture = 18 Placebo laser acupuncture (no laser) = 30	1) VAS
19. Observation on ear point taping and pressing therapy for treatment of primary dysmenorrhea <sup>40)</sup> .			
Ear point taping and pressing (Spirit gate, Uterus, Endocrine, Subcortex, Sympathetic nerve, Kidneys)	N = 114	A RCT Treatment group = 60 Western group (Indomeixin enteric tablets) = 54	1) Total effective rate
20. Observation on immediate analgesic effect of acupuncture at Shiqizhui (EX-B8) only or multi-acupoints in patients with dysmenorrhea: a randomized controlled trial <sup>41)</sup> .			
Acupuncture (EX-B8)	N = 38	A RCT EX-B 8 group = 19 Multi acupoints = 19 (SP6, SP8, BL32)	1) VAS 2) CMSS (Cox Menstrual Symptom Scale)
21. Randomized controlled clinical study on ginger-partitioned moxibustion for patients with cold-damp stagnation type primary dysmenorrhea <sup>42)</sup> .			
Ginger-partitioned moxibustion (CV8, CV4)	N = 209	A RCT Moxibustion group = 105 Medication group = 104 (Yueyueshu granules)	1) Clinical symptom scores

pulsatility index, resistance index, and ratio of systolic peak/diastolic peak of uterine arteries, prostaglandin level, proportion of participants using analgesics, HRV (Heart Rate Variability).

#### 4. Classification by therapy (Fig 7,8) (Table 1,2)

In Korean journals, there were 4 herbal medicine,

5 acupuncture/moxibustion, 1 other clinical research journals, and 2 herbal medicine case report journals. In overseas journals, there were 6 herbal medicine, 13 acupuncture/moxibustion, and 2 other clinical research journals.

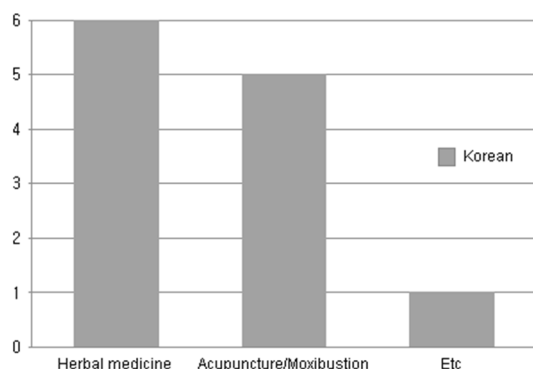


Fig. 7. Comparison of therapy on journal articles in Korea

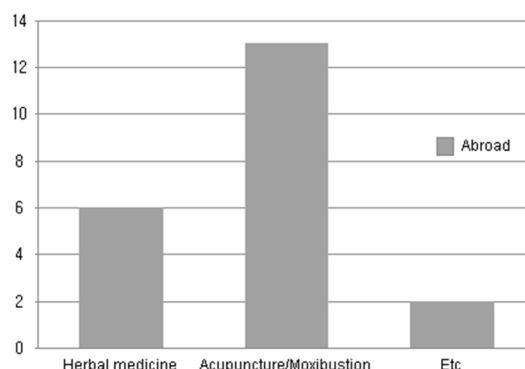


Fig. 8. Comparison of therapy on journal articles abroad

## Discussions

This study was conducted to analyze Oriental medical research on dysmenorrhea published within 10 years (2002-2012) and to support follow-up studies.

### 1. Discussion on field: Therapeutic-sided studies.

The largest proportion of both Korean and overseas journals were therapeutic. Especially, all the overseas journals were therapeutic. More diverse types of research would have to be conducted such as development of evaluation tools or formula of herbal medicine, standards of diagnosis or therapy.

### 2. Discussion on typology: Absence of longitudinal study and Oriental medical differentiation of syndromes in clinical studies.

There existed some cross-sectional studies, but no longitudinal studies. In longitudinal studies, long time follow-up observation is difficult and risk of subjects' breaking away is high. But from an angle of medical expenses, two obstacles would be removed.

Also, in clinical studies, most of the research excluded Oriental medical differentiation of

syndromes. If all subjects of the experimental group are given the same herbal medicine and therapies, the results of the clinical study are not trustworthy. Large number of RCTs were conducted abroad so positive effect on follow-up studies would be outstanding. But with the exception of Oriental medical differentiation of syndromes, these studies can't provide reasonable evidence of therapeutic effects of Oriental medicine.

### 3. Discussion on evaluation tools:

#### Absence of development of objective evaluation tools

Clinical studies are valuable for follow-up studies because these studies provide research protocols such as evaluation tools (outcome measurements), methods of setting experimental/control group, placebo-control, etc.

In evaluation of dysmenorrhea, patients' own complaints of observable symptoms are important, so in clinical or case studies, selection of evaluation tool is important to diagnose or compare before and after the therapy. Especially, existence of objective evaluation tools is the core of research design.

VAS, MVRS, VRS, and Patient's Global Assessment are subjective evaluation tools which assess patients' own complaints of intensity of pain.

These subjective evaluation tools have low reliability and stability because subjects' condition (attitude, action, mood, knowledge, physical condition) changes with time<sup>4</sup>). In other words, subjective evaluation tools are important but other objective evaluation tools which have high reliability and stability are needed.

In Korean journals, the only objective evaluation tool was DITI. DITI can give objective information if conditions (psychological stability, 15 minutes of adjusting to room temperature, no wind, maintaining the right room temperature (20-24°C), inhibition of physical therapy, drinking alcohol or using drugs, etc.) are properly controlled<sup>5</sup>). But DITI is applicable only for the cold-damp stagnation type.

With evaluation tools in overseas journals, there's one other point which calls for attention. There was no use of blood tests, ultrasound, HRV, or proportion of participants using analgesics among the systemic review studies<sup>6</sup>) from 1979 to 2003.

Primary dysmenorrhea is thought to be caused by the increase of PG (prostaglandin) production in the endometrium. PG increases the level of tension and contraction strength of uterus and blood vessels, and this process may induce pain<sup>7</sup>). So, the measure of PG level can be an indicator of intensity of dysmenorrhea. PG level is not the only cause of the intensity of dysmenorrhea, so there's a limit to use of this evaluation tool, but PG level can show the therapeutic effect on dysmenorrhea objectively.

Secondly, measure of pulsatility index, resistance index, and ratio of systolic peak/diastolic peak of uterine arteries by ultrasound can also be an objective and direct evaluation tool.

Thirdly, HRV measures activity of the autonomic nervous system. If stress reaction increases, the sympathetic system is activated and parasympathetic system is inactivated. If this status continues, the autonomic nervous system loses its balance control, so neurotransmitter, neurosecretion, and immune systems lose their normal function. This process

induces dysmenorrhea<sup>8</sup>). Observation on change of HRV can thus assess the therapeutic effect on dysmenorrhea.

These three objective evaluation tools have been used by clinical studies only in the past 10 years, and are thought to be valuable tools for follow-up studies. More studies about development of new evaluation tools are needed, too. For example, it is known that acupuncture reduces headache, and once headache is reduced, increase of  $\alpha$  wave on parieto-occipital and occipital area is observed on EEG (electroencephalography)<sup>9</sup>). Objective evaluation tools used for general pain diseases have to be reviewed for whether they can be used for assessment of dysmenorrhea. Sectional studies are also needed to verify the validity.

#### 4. Discussion of therapy: Absence of studies about diverse Oriental medical therapies

In Korean journals, Gyejibongnyeong-hwan, Jujadanggui-hwan, and Hyunburikyung-tang were used most frequently. Also, SP6 in experimental groups and GB39 in control groups were used most frequently. In auricular acupuncture, Uterus, Sympathetic nerve, Subcortex, and Endocrine points were used most frequently.

In overseas journals, Samul-tang (Siwu-tang) was used most frequently. Also, SP6 was used most frequently. In auricular acupuncture, Spirit gate, Uterus, Endocrine, Subcortex, Sympathetic nerve, and Kidney points were used most frequently. In electroacupuncture, SP6 was used most frequently, and in moxibustion, CV8 was used most frequently.

SP6 relieves stagnancy of ki of the liver, tonifies the kidneys and invigorates the spleen to resolve dampness, so SP6 is used for urogenital diseases. Also, it is commonly used for general gynecological diseases<sup>10</sup>). Gyejibongnyeong-hwan and Samul-tang (Siwu-tang) cure stagnation of ki and stasis of blood,

cold-damp stagnation, and deficiency of both ki and blood.

In therapeutic studies, almost all the journals were about acupuncture/moxibustion, or herbal medicine. Only one was about functional under inner-wear. Other studies about diverse therapies such as pharmacopuncture and herbal medicine steam bath on pelvis are thought to be needed.

### Conclusions

1. This study analyzed 61 journal articles published from 2002 to 2012.

2. The largest proportion of both Korean and overseas journals was therapeutic. More diverse type of research will have to be conducted for accumulation of evidence.

3. Absence of longitudinal studies and Oriental medical differentiation of syndromes in clinical studies was thought to be a critical point. If all subjects of experimental groups are given the same herbal medicine and therapies, the results of the clinical study are not trustworthy. So selection of experimental group and therapy following Oriental medical differentiation of syndromes are needed to accumulate accurate evidence of Oriental medical therapeutic effect on dysmenorrhea.

4. VAS was selected in 23 journal articles among 33. Subjective evaluation tools are important but other objective evaluation tools which have high reliability and stability are needed. Recent studies suggest PG level, pulsatility index, resistance index, ratio of systolic peak/diastolic peak of uterine arteries, and proportion of participants using analgesics.

5. More well-designed randomized-controlled studies and diverse approaches are necessary to make accumulation of evidence on Oriental medical therapy of dysmenorrhea.

### References

1. The compilation committee of Korean medicine of gynecology. Korean Medicine of Gynecology. Seoul:Jungdam. 2007:196-201.
2. Dawood MY. Dysmenorrhea. J Reprod Med. 1985;30(3):154-67.
3. Lee JY, Choi YM, Shin CJ, Moon SY, Chang YS. Treatment of endometriosis with a delayed release formulation of a gonadotropin releasing hormone agonist. Korean Journal of Obstetrics and Gynecology. 1989;32(8):1019-27.
4. Choi JY. Reliability of Visual Analog Scale in assessment of acute pain. Journal of Korean Academic Society of Nursing Education. 2003;9(1):136-43.
5. Chang SY, Kim HJ, Lee DY, Lee EY. Effect of hominis placenta herbal acupuncture on dysmenorrhea. The Journal of Korean Acupuncture & Moxibustion Society. 2005;22(6):85-92.
6. Park MW, Cho JH, Jang JB, Lee KS. Review on objective evaluation of dysmenorrhea. The Journal of Oriental Obstetrics & Gynecology. 2006;19(1):178-87
7. Kim T. Pathogenesis and management guideline of dysmenorrhea. Korean Journal of Obstetrics and Gynecology. 2005;48(7):1613-20
8. Kim EG, Lee MJ, Hwang DS, Lee JM, Jang JB, Lee KS, et al. A study about Heart Rate Variability (HRV) of examinees with dysmenorrhea. The Journal of Oriental Obstetrics & Gynecology. 2011;24(4):50-61
9. Baek WY. EEG spectrum analysis and neuroendocrinological evaluation in the recovery of chronic headache patients by traditional acupuncture and laser acupuncture. Daegu: Kyungpook National University; 2000.
10. Ahn YK. A library of meridian points study. Seoul:Sungbosa. 2002:228-9.

11. Nam EJ, Lee YK, Lee DN, Kim HJ. Clinical study on the effect of Gyejibongnyeong capsule in the treatment of primary dysmenorrhea. *Korean Journal of Oriental Physiology & Pathology*. 2006;20(5):1364-8.
12. Cho JH, Kim HS, Choi DY, Lee JD. A clinical study on the effect of aroma ceramic moxibustion for primary dysmenorrhea. *The Journal of Oriental Obstetrics & Gynecology*. 2009;22(1):172-81.
13. Mun DB, Kim MJ, Um YK, Kong BC, Lee IS. Clinical study on the efficacy Jujadanggui-hwan for dysmenorrhea. *The Journal of Oriental Obstetrics & Gynecology*. 2005;18(2):83-99.
14. Kim HJ, Sohn YJ, Lee YH. A clinical study on the effect of dysmenorrhea clinic for female college students. *The Journal of Oriental Obstetrics & Gynecology*. 2012;25(2):142-53.
15. Yoon YJ, Cho JH, Lee KS. The evaluation of usefulness for far-infrared radiating under inner-wear on dysmenorrhea. *The Journal of Oriental Obstetrics & Gynecology*. 2007;20(3):129-36.
16. Kim BN, Zhang KH, Kim SH, Kim SW. A clinical study on the efficacy of electrostimulation on acupuncture loci in the treatment of dysmenorrhea. *The Journal of Oriental Obstetrics & Gynecology*. 2004;17(2):138-46.
17. Jung HS, Joo BJ, Lee DN, Kim HJ, Lee JH, Lee EY. A clinical study on the effect of auricular acupuncture treatment for adolescent dysmenorrheic women. *The Journal of Oriental Obstetrics & Gynecology*. 2002;15(5):183-92.
18. Joo BJ, Lim SM, Kim HJ, Lee DN. A clinical study on the effect of immediate decrease of pain for acupuncture treatment in adolescent primary dysmenorrheic patients. *The Journal of Oriental Obstetrics & Gynecology*. 2003;16(2):232-41
19. Jang JB, Choi YH, Yoon YJ, Cho JH, Lee KS. Clinical study on the efficacy and safety of Chiljehyangbuhwan in the treatment of dysmenorrhea. *The Journal of Oriental Obstetrics & Gynecology*. 2005;18(1):156-68.
20. Yuk SS, Lim EM. A clinical study on the effect of crossing over treatment of acupuncture and herbal medication for primary dysmenorrhea. *The Journal of Oriental Obstetrics & Gynecology*. 2005;18(4):144-52.
21. Lim JH, Cho HJ, Lee SL, Choi EM. Clinical efficacy of Hyunburikyungtang-gagam for dysmenorrhea caused qi-stagnation and blood clots. *The Journal of Oriental Obstetrics & Gynecology*. 2002;15(4):228-37.
22. Yeh LLL, Liu JY, Lin KS, Liu YS, Chiou JM, Liang KY, et al. A randomised placebo-controlled trial of a traditional Chinese herbal formula in the treatment of primary dysmenorrhoea. *Trial of Chinese Herb Medicine*. 2007;2(8):e719
23. Cheng JF, Lu ZYJ, Su YCH, Chiang LC, Wang RY. A traditional Chinese herbal medicine used to treat dysmenorrhoea among Taiwanese women. *Journal of Clinical Nursing*. 2008;17(19):2588-95.
24. Smith CA, Crowther CA, Petrucco O, Beilby J, Dent H. Acupuncture to treat primary dysmenorrhea in women : a randomized controlled trial. *Evidence-based Complementary and Alternative Medicine*. 2011;1-11.
25. Park JS, Park S, Cheon CH, Go HY, Sun SH, Shin YC, et al. Effects of Gyejibongnyeong-hwan on dysmenorrhea caused by blood stagnation: study protocol for a randomized controlled trial. *Trials*. 2012;13:3.
26. Yu YP, Ma LX, Ma YX, Liu YQ, Liu CZ, Xie JP, et al. Immediate effect of acupuncture at Sanyinjiao (SP6) and Xuanzhong (GB39) on uterine arterial blood flow in primary dysmenorrhea. *J Altern Complement Med*. 2010;16(1):1073-8.

27. Kennedy S, Jin X, Yu H, Zhong S, Magill P, van Vilet T, et al. Randomized controlled trial assessing a traditional Chinese medicine remedy in the treatment of primary dysmenorrhea. *Fertil Steril.* 2006;86(3):762-4.
28. Oya A, Oikawa T, Nakai A, Takeshita T, Hanawa T. Clinical efficacy of Kampo medicine (Japanese traditional herbal medicine) in the treatment of primary dysmenorrhea. *J Obstet Gynaecol Res.* 2008;34(5):898-908.
29. Liu YQ, Ma LX, Xing JM, Cao HJ, Wang YX, Tang L, et al. Does Traditional Chinese Medicine pattern affect acupoint specific effect? Analysis of data from a multicenter, randomized, controlled trial for primary dysmenorrhea. *J Altern Complement Med.* 2013;19(1):43-9.
30. Jang JB, Yoon YJ, Park JH, Jeong HG, Cho JH, Ko SG. Therapeutic effects of Chiljehyangbuhwan on primary dysmenorrhea: A randomized, double blind, placebo-controlled study. *Complement Ther Med.* 2009;17(3):123-30.
31. Li CH, Wang YZ, Guo XY. Acupuncture at Siguan points for treatment of primary dysmenorrhea. *Zhongguo Zhen Jiu.* 2008;28(3):187-90.
32. Guo A, Meng Q. Acupuncture combined with spinal tui na for treatment of primary dysmenorrhea in 30 cases. *Tradit Chin Med.* 2008;28(1):7-9.
33. Witt CM, Reinhold T, Brinkhaus B, Roll S, Jena S, Willich SN. Acupuncture in patients with dysmenorrhea: a randomized study on clinical effectiveness and cost-effectiveness in usual care. *Am J Obstet Gynecol.* 2008;198(2):166.e1-8.
34. Lin LL, Liu CZ, Huang BY. Clinical observation on treatment of primary dysmenorrhea with acupuncture and massage. *Zhongguo Zhong Xi Yi Jie He ZaZhi.* 2008;28(5):418-20.
35. Kim E, Cho JH, Jung WS, Lee S, Pak SC. Effect of acupuncture on heart rate variability in primary dysmenorrheic women. *Am J Chin Med.* 2011;39(2):243-9.
36. Wong CL, Lai KY, Tse HM. Effects of SP6 acupressure on pain and menstrual distress in young women with dysmenorrhea. *Complement Ther Clin Pract.* 2010;16(2):64-9.
37. Zhu Y, Chen RL, Le JI, Miao FR. Efficacy observation of primary dysmenorrhea treated with isolated-herbal moxibustion on Shenque (CV 8). *Zhongguo Zhen Jiu.* 2010;30(6):453-5.
38. Liu CZ, Xie JP, Wang LP, Zheng YY, Ma ZB, Yang H, et al. Immediate analgesia effect of single point acupuncture in primary dysmenorrhea: a randomized controlled trial. *Pain Med.* 2011;12(2):300-7.
39. Kempf D, Berger D, Ausfeld-Hafter B. Laser needle acupuncture in women with dysmenorrhoea: a randomised controlled double blind pilot trial. *Forsch Komplementmed.* 2009;16(1):6-12.
40. Wu RD, Zhang HD, Lin LF. Observation on ear point taping and pressing therapy for treatment of primary dysmenorrhea. *Zhongguo Zhen Jiu.* 2007;27(11):815-7.
41. Li YM, Bu YQ, Hou WJ, Chen SZ, Gao SZ. Observation on immediate analgesic effect of acupuncture at Shiqizhui (EX-B8) only or multi-acupoints in patients with dysmenorrhea: a randomized controlled trial. *Zhongguo Zhen Jiu.* 2011;31(3):199-202.
42. Sun LH, Ge JJ, Yang JJ, She YF, Li WL, Li XH, et al. Randomized controlled clinical study on ginger-partitioned moxibustion for patients with cold-damp stagnation type primary dysmenorrhea. *Zhen Ci Yan Jiu.* 2009;34(6):398-402.