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기능성 소화불량증에 사용된 침구치료방법에 대한 체계적 문헌고찰

김보영 · 서복남 · 박지은 · 양창섭 · 김익태 · 임지원 · 김영은

한국한의학연구원

A Systematic Review of Acupuncture-Moxibution Treatment for Functional Dyspepsia

Bo-Young Kim, Bok-Nam Seo, Ji-Eun Park, Chang-Sop Yang,
Ick-Tae Kim, Ji-Won Im, Young-Eun Kim

Korea Institute of Oriental Medicine

Objectives : The aim of this study is to review the methodology of clinical trials conducted with the acupuncture and moxibustion treatment on functional dyspepsia. **Methods :** We searched four international databases and three Korean databases including English, Korean and Chinese, through March 2016 for randomized controlled trials(RCT) and non-randomized case-control trials(CCT) that evaluated the effects of the acupuncture and moxibustion on functional dyspepsia. We abstracted the designs of the trials and the method of acupuncture and moxibustion treatment according to the Standards for Reporting Interventions in Clinical Trials of Acupuncture. **Results :** A total 117 papers were reviewed. The 106 studies were conducted in China. There were 111 RCTs(95%), and 6 CCTs(5%). Sixty eight studies(59%) were conducted with the manual acupuncture, 29 studies of electro-acupuncture(25%), 11 studies of moxibustion(9%), 5 studies of acupoints embedding therapy(4%), 4 studies of acupoint injection therapy(3%) were conducted. ST36, CV12, ST25 were most frequently used for acupoints to treat functional dyspepsia. In 59 studies(50%), western medication was used in the control group, and the effects of acupuncture and moxibustion were evaluated with the symptoms in most studies. **Conclusions :** These results suggest that it is necessary to develop more detailed reporting standards about acupuncture and moxibustion treatment method as the method of acupuncture and moxibustion is getting more diverse, and more objective tools are needed in evaluating functional dyspepsia.

Key words : functional dyspepsia, acupuncture, systematic review, moxibustion

서 론

기능성 소화불량증(Functional Dyspepsia)은 인과관계가 뚜렷한 기질적 질환이 없으면서 만성적이며 반복적인 위장관 증상(상복부 통증, 상복부 팽만감, 조기 만복감, 포만감, 오심, 구토, 트림 등)이 동반되어 식후에 주로 나타나는 임상증후군이다[1]. 최근 국내 건강검진 대상자 다기관 연구 사례를 보면, 기능성 소화불량증의 비율은 20.4%에 달하고 있으며 전세계에서의 유병률은 약 25%로 추정될 정도로 흔한 질환이다[2].

한의학에서 기능성 소화불량은 내상(內傷)의 범주에 속하며 병인으로 음식상(飮食傷) 등이 있고 병증은 심하비(心下痞), 심통(心痛), 오심(惡心), 구토(嘔吐)의 범주에서 다루고 있다[3]. 기능성 소화

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Corresponding author: **Young-Eun Kim**
Korea Institute of Oriental Medicine, 1672 Yuseong-daero, Yuseong-gu, Daejeon 34054, Korea
Tel: +82-42-868-9661, Fax: +82-42-869-2756, E-mail: jade2010@kiom.re.kr

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불량의 치료방법으로 침치료가 문헌에서 중요하게 언급되고 있고, 그 효과를 증명하는 연구가 꾸준히 이루어지고 있는데[4-6], Lan 등이 수행한 체계적 문헌고찰 및 메타분석연구에서는 기능성 소화불량에 대한 침치료의 효과에 대하여 분석 대상이 되는 연구의 질이 낮아 명확한 근거를 내릴 수 없다고 보고하였다[5]. 반면, Kim 등의 체계적 문헌고찰 및 메타분석연구에서는 침치료가 샴침에 비하여 효과가 있고, 약물치료와 유사한 결과를 보인다고 하고 있으나 침치료의 방법이 다양하여 manual acupuncture 외 electro acupuncture에 대한 추가적 분석과 각 연구에서 사용된 혈위에 대한 추가적인 연구가 필요하다고 보고한 바 있다[4]. 향후 향상된 질의 임상연구를 디자인하거나 보다 적절한 침구치료 방법을 선택하기 위해서는 전문가 논의 뿐만 아니라, 효과적인 침구치료법 고찰과 정확한 연구방법론 설정을 위해 선행연구에서 사용된 침구치료 방법과 연구디자인 등을 살펴볼 필요가 있다[7].

본 연구에서는 기능성 소화불량에 침구요법을 적용한 선행연구의 (1) 연구디자인, 대조군 설정, 평가변수 등의 연구방법론과 (2) 치료방법, 치료횟수 및 기간 등의 침구치료방법에 관하여 중점적으로 살피는 목적의 체계적 문헌고찰을 수행하고자 한다.

대상 및 방법

1. 선정기준

본 연구는 기능성 소화불량에 대해 경락경혈을 이용한 다양한 침구요법의 효과를 검증한 연구를 분석대상으로 선정하였다. 동물실험을 제외한 인간 대상 연구 중 무작위 대조군 연구(Randomized Controlled Trial, RCT)와 비교임상연구(Controlled Clinical Trial, CCT)를 포함하였고 학술지를 비롯하여 학위논문 및 학술대회 자료집을 포함하였다. 대상질환이 기능성 소화불량을 기저가 되어 유발된 2차성 소화불량인 경우는 제외하였고, 침구요법과 다른 치료법을 병행한 경우 역시 선정대상에서 제외하였다. 다만 치료군과 대조군의 차이가 침구요법인 경우, 즉 비교군 간에 침구요법 적용여부만 달라 침구요법 적용의 효과를 판별할 수 있는 경우는 포함하였다.

2. 정보원 및 검색전략

검색데이터베이스는 국제 학술논문 데이터베이스(MEDLINE, EMBASE, CENTRAL), 중국 학술논문 데이터베이스(CNKI), 국내 학술논문 데이터베이스(NDSL, RISS), 국내 한의학 학술논문 데이터베이스(OASIS)를 활용하였다. 검색은 2016년 3월 10일 1차 수행하였고 2016년 6월 8일 2차 수행하였다.

검색어는 영어, 중국어, 한국어로 한정하였으며 MEDLINE, CENTRAL, NDSL, OASIS에서는 [(dyspepsia or indigestion or digestion or postprandial or intestinal or gastro or gut or epigastric or stomach) and(acup* or electroacupuncture or mox*)]를 이용하였고, EMBASE에서는 ['dyspepsia' OR 'dyspepsia'/exp OR dyspepsia OR 'indigestion' OR 'indigestion'/exp OR indigestion OR 'digestion' OR 'digestion'/exp OR digestion OR postprandial OR intestinal OR 'gastro' OR 'gastro'/exp OR gastro OR 'gut' OR 'gut'/exp OR gut OR epigastric OR 'stomach' OR 'stomach'/exp OR stomach AND(acup* OR 'electroacupuncture' OR 'electroacupuncture'/exp OR electroacupuncture OR mox*) AND([article]/lim OR [article in press]/lim OR[review]/lim OR[short survey]/lim) AND [humans]/lim AND [embase]/lim]을 이용하였으며, CNKI에서는 MEDLINE 검색식의 영어와 중국어로 검색하였다.

3. 자료 분석 방법

본 연구는 기능성 소화불량에 대한 침구요법의 연구현황에 대한 문헌고찰로 제목(Title)과 초록(Abstract)으로 1차 분석대상 선정과정을 거친 후, 선정된 논문의 원문을 확보하여 각 논문의 전문(Full Text)을 검토하여 최종 대상 선정 및 분석을 진행하였다. 중국논문의 경우는 중국어를 모국어로 사용하는 연구자에게 자문을 얻었고 독립된 두 명의 연구자가 검토 및 분석하였으며 연구자 간의 의견이 불일치하는 경우 제 3의 연구자와의 협의를 통해 최종적으로 결정하였다.

4. 데이터 추출

본 연구에서는 두 가지 정보를 분석하였다. 첫번째로는 연구디자인 분석을 위하여 연구의 일반적 특성인 연구설계(Study Design), 표본 수(Number of subjects), 선정기준(Inclusion criteria), 중재군 및 대조군(Intervention group/Control group), 평가변수(Outcome)를 살펴보았다. 두번째로 침구요법의 사용경향을 살펴보고자 침구치료의 재현성을 높이기 위한 중재보고 표준지침인 STRICTA (Standards for Reporting Interventions in Controlled Trials of Acupuncture)[8] 중 중재유형(Type of intervention), 자침 깊이(Insertion depth), 득기반응(Deqi achievement), 자극형태(Detail of stimulation), 유침시간(Retention time), 침의 형태(Needle type), 치료횟수(Number of treatment sessions), 치료 시간 (Duration of treatment sessions), 사용한 경혈(Acupuncture point), 시술자

Table 1. Characteristics of articles of Acupuncture Treatment for Functional Dyspepsia

Author(year)	Study design	Number of subjects Total(int/cont)	Inclusion criteria	Intervention group	Control group	Results(Between A and B)
Chu(1994)[16]	RCT	168(83/85)	Symptom	A: MA+medication	B: Medication	1. Satiety, diarrhea: $p>0.05$ 2. Bloating: $p<0.05$ 3. Epigastric pain: $p<0.01$
Chen(1998)[17]	RCT	38(18/20/31)	Rome Diagnosis	A: Acupuncture	B: Medication C: Healthy subjects, no treatment	1. Before treatment, EGG(freqeuncy): A=B<C
Chen(2000)[18]	RCT	158(83/75)	Chinese Diagnosis I	A: MA	B: Medication	1. Clinical efficacy: $p<0.05$ 2. Motilin: $p<0.01$ 3. Pyloric opening: $p<0.05$ 4. Passing time of mouth-cecum: $p<0.01$
Liu(2001)[19]	RCT	68(38/30)	Chinese Diagnosis I	A: MA	B: Medication	1. Efficacy: $p<0.05$ 2. EGG: $p<0.05$ 3. Motilin: $p<0.05$ 4. Passing time of mouth-cecum: $p<0.05$
Liu(2002)[20]	RCT	90(60/30)	Chinese Diagnosis I	A: Manual+auricular acupuncture	B: Medication	1. Clinical efficacy: $p<0.05$ 2. Symptom: $p<0.05$
Wang(2002)[21]	RCT	81(45/36)	Symptom	A: MA	B: Medication	1. Clinical efficacy: $p<0.05$
Shi(2003)[22]	RCT	66(35/31)	Chinese Diagnosis I	A: MA+cupping	B: Medication	1. Clinical efficacy: $p<0.05$
Feng(2004)[23]	RCT	65(35/30)	Chinese Diagnosis I	A: Manual+auricular acupuncture	B: Medication	1. Clinical efficacy: $p<0.05$ 2. HAMD: $p<0.001$
Li(2004)[24]	RCT	123(60/63)	Chinese Diagnosis I	A: MA	B: Medication	1. Clinical efficacy: $p<0.05$ 2. Symptom: $p<0.05$
Zhang(2004)[25]	RCT	92(46/46)	Rome Diagnosis	A: MA	B: Medication	1. Clinical efficacy: $p<0.01$
Zhou(2004)[26]	RCT	126(64/62)	Symptom	A: MA	B: Medication	1. Clinical efficacy: $p<0.01$ 2. Fornon-specific FD, clinical efficacy: $p<0.05$ 3. Dyskinetic FD, clinical efficacy: $p>0.05$
Chen(2005)[27]	RCT	90(30/30/30)	Rome Diagnosis	A: MA	B: Medication C: Marzulene-Sgranules	1. Symptom: $p<0.05$ 2. MTL: $p<0.05$ 3. EGG: $p<0.05$
Xu(2005)[28]	RCT	87(45/42)	Chinese Diagnosis I	A: MA	B: Medication	1. Clinical efficacy: $p<0.01$ 2. EGG: $p<0.01$
Park(2007)[29]	RCT	68(34/34)	Rome Diagnosis	A: MA	B: SA(non acupoint)	1. NDI: NS 2. FD-QOL: $p<0.01$
Oh(2008)[30]	RCT	20(10/10)	Symptom	A: MA	B: SA(non acupoint)	1. Gastrointestinal movement: $p=0.19$
Wang(2008)[31]	CCT	104(66/40)	Rome Diagnosis	A: MA	B: No treatment	1. Gastronic motility: $p<0.05$ 2. Gastronic emptying: $p<0.05$
Park(2009)[32]	RCT	72(38/38)	Rome Diagnosis	A: MA	B: SA(non acupoint)	1. Pressure in upper abdomen: $p<0.01$(A>B) 2. Cramps in upper abdomen: $p<0.05$(A>B) 3. QoL of NDI: $p<0.001$(A, B)
Wong(2009)[33]	RCT	16(9/7)	Rome Diagnosis	A: MA	B: SA(non acupoint)	1. Symptom: $p<0.05$ 2. HR-QOL, HAMD, Stress Scale total score: NS

Table 1. Continued

Author(year)	Study design	Number of subjects Total(int/cont)	Inclusion criteria	Intervention group	Control group	Results(Between A and B)
Yang(2009)[34]	RCT	90(30/30/30)	Rome Diagnosis	A: MA	B: Medication C: SA(non acupoint)	1. Clinical efficacy: $p<0.01$ 2. EGG(frequency, amplitude, rhythm): $p<0.05$ 3. Clinical efficacy: $p<0.01$ 4. EGG(frequency, amplitude, rhythm): $p<0.01$
Chang(2010)[35]	RCT	60(30/30)	Rome Diagnosis	A: MA	B: SA(placebo acupoints)	1. Clinical efficacy: $p<0.01$ 2. NDLQI: $p<0.01$ 3. SF-36: $p<0.01$
Lan(2010)[36]	RCT	60(30/30)	Rome Diagnosis	A: MA	B: SA(placebo acupoints)	1. NDSI: $p<0.01$
Lan(2010)[37]	RCT	60(30/30)	Rome Diagnosis	A: MA	B: Placebo(MA at placebo acupoints)	1. Symptom: $p<0.01$ 2. FDI: $p<0.01$
Li(2010)[38]	RCT	65(33/32)	Rome Diagnosis, Chinese Diagnosis III	A: MA+moxibustion	B: Medication	1. Symptom: $p<0.05$
Li(2010)[39]	RCT	113(37/38/38)	Rome Diagnosis, Chinese Diagnosis III	A: Finger acupuncture	B: MA C: Medication (omeprazole)	1. Symptom: $p<0.01$ 2. EGG: $p<0.01$ 3. Symptom: $p<0.01$ 4. EGG: $p<0.01$
Ren(2010)[40]	CCT	72(42/30)	Rome Diagnosis	A: MA	B: No treatment	1. Gastronic emptying: $p<0.05$
Shi(2010)[41]	RCT	65(33/32)	Rome Diagnosis	A: MA+moxibustion(Zhao's thunder-fire wonder)	B: MA+moxibustion (manual)	1. Clinical efficacy: $p<0.05$ 2. Symptom: $p<0.05$
Wu(2010)[42]	RCT	70(35/35)	Rome Diagnosis	A: MA	B: Medication	1 Clinical efficacy: $p<0.05$
Chen(2011)[43]	RCT	128(62/66)	Rome Diagnosis	A: MA+medication	B: Medication	1. Clinical efficacy: $p<0.05$
Lin(2011)[44]	RCT	70(35/35)	Chinese Diagnosis III	A: AA	B: Medication	1. Clinical efficacy: NS 2. Symptom: $p<0.05$
Lin(2011)[45]	RCT	70(35/35)	Rome Diagnosis	A: AA	B: Medication	1. Major symptom: $p<0.01$ 2. Upper abdominal pain $p<0.01$ 3. Bloating: $p<0.01$ 4. Belching: $p<0.01$
Liu(2011)[46]	RCT	116(40/38/38)	Rome Diagnosis	A: MA+medication	B: MA C: Medication	1. Clinical efficacy: $p<0.05$ 2. Clinical efficacy: $p>0.05$
Yang(2011)[47]	RCT	61(31/30)	Rome Diagnosis	A: MA	B: SA(placebo acupoints)	1. Clinical efficacy: $p<0.05$ 2. NDI: $p<0.01$
Zhang(2011)[48]	RCT	32(15/17)	Rome Diagnosis	A: MA	B: SA(placebo acupoints	1. GSRS: $p<0.01$
Chen(2012)[49]	RCT	112(54/58)	Symptom	A: MA+Medicine	B: Medication	1. Clinical efficacy: $p<0.05$
Guo(2012)[50]	RCT	64(33/31)	Rome Diagnosis	A: MA	B: MA+medication	1. Clinical efficacy: $p<0.05$ 2. Symptom: $p<0.05$ 3. NDI: $p<0.05$

Table 1. Continued

Author(year)	Study design	Number of subjects Total(int/cont)	Inclusion criteria	Intervention group	Control group	Results(Between A and B)
He(2012)[51]	RCT	260(130/130)	Rome Diagnosis	A: MA+medication	B: Medication	1. Clinical efficacy: $p<0.05$ 2. Symptom: $p<0.05$
Liao(2012)[52]	RCT	80(40/40)	Rome Diagnosis	A: MA	B: Medication	1. Clinical efficacy: $p<0.05$ 2. SAS, SDS: $p<0.05$ 3. SF-36: $p<0.05$
Liu(2012)[53]	RCT	88(44/44)	Rome Diagnosis	A: MA(with syndrome differentiation)	B: MA(without syndrome differentiation)	1. Symptom: $p<0.05$ 2. NDSI: $p<0.05$ 3. SF-36: $p<0.05$
Sun(2012)[54]	RCT	100(50/50)	Rome Diagnosis	A: Warm acupuncture (symptom differentiation)	B: Medication	1. Clinical efficacy: $p>0.05$ 2. symptom: $p<0.05$
Wang(2012)[55]	RCT	116(36/39/41)	Chinese Diagnosis I	A: MA(ST42, ST40, ST36, ST34) B: MA(ST38, ST33, ST32, ST35)	C: SA(non-acupoints)	1. Clinical efficacy: $p<0.05$ 2. Clinical efficacy: $p<0.05$ 3. FDI: $p<0.05$ 4. SF-36: $p<0.05$
Huang(2013)[56]	RCT	64(32/32)	Rome Diagnosis	A: MA(with syndrome differentiation)	B: MA(without syndrome differentiation)	1. GAS: $p<0.05$ 2. MTL: $p<0.05$ 3. NDSI: $p<0.05$ 4. NDLQI: $p<0.05$
Jin(2013)[57]	RCT	72(36/36)	Symptom	A: MA	B: Medication	1. Clinical efficacy: $p<0.05$ 2. Symptom: $p<0.05$ 3. SF-36: $p<0.05$
Lee(2013)[58]	RCT	60(30/30)	Symptom	A: MA+herbal medication	B: Acupoint injection+ (banhasasimtang Ex+chungwidan Ex)	1. NDI-K: $p>0.05$
Lima(2013)[59]	RCT	30(15/15)	Rome Diagnosis	A: MA(specific)+medication	B: MA(non specific)+ medication	1. GSRS: $p<0.001$ 2. Anxiety: $p<0.003$
Shi(2013)[60]	RCT	60(30/30)	Rome Diagnosis	A: MA+medication	B: Medication	1. Symptom: $p<0.05$
Zheng(2013)[61]	RCT	60(30/30)	Rome Diagnosis, Syndrome differentiation	A: MA+needle warming moxibustion	B: Medication	1. Clinical efficacy: $p<0.05$ 2. Symptom: $p<0.05$
Li(2014)[62]	RCT	120(40/40/40)	Rome Diagnosis	A: MA(weak intensity)	B: MA(median intensity) C: MA(strong intensity)	1. Clinical efficacy: $p<0.05$ 2. Sign: $p<0.05$ 3. Symptom: $p<0.05$ 4. NDI: $p<0.05$ 5. SF-36: $p<0.05$ 6. MTL: $p<0.05$
Shui(2014)[63]	RCT	120(40/40/40)	Rome Diagnosis	A: MA	B: Chinese medicine (sihosogan tang) C: Medication	1. Clinical efficacy A&BC: $p<0.05$ 2. Symptom A&BC: $p<0.05$ 3. GAS, MTL: $p<0.05$
Yu(2014)[64]	CCT	72(37/35)	Chinese Diagnosis II	A: MA+herbal medication	B: Medication	1. Clinical efficacy: $p<0.05$
Zhang(2014)[65]	RCT	91(33/28/30)	Rome Diagnosis	A: MA	B: Medication C: MA+medication	1. Clinical efficacy: $p<0.05$ 2. FDI: $p<0.05$

Table 1. Continued

Author(year)	Study design	Number of subjects Total(int/cont)	Inclusion criteria	Intervention group	Control group	Results(Between A and B)
Zhang(2014)[66]	RCT	70(35/35)	Rome Diagnosis, Syndrome Differentiation	A: MA	B: Medication	1. Symptom: $p<0.05$
Zhou(2014)[67]	RCT	63(32/31)	Rome Diagnosis	A: MA(syndrome differentiation)	B: MA(ordinary)	1. Clinical efficacy: $p<0.05$ 2. Symptom: $p<0.01$
Zhou(2014)[68]	RCT	70(34/36)	Rome Diagnosis	A: MA	B: Medication	1. Clinical efficacy: $p<0.05$ 2. Symptom: $p<0.01$ 3. SF-36: $p<0.05$ 4. GAS: $p<0.05$
Hu(2015)[69]	RCT	68(34/34)	Chinese Diagnosis III	A: MA(2.5 cun length needle)	B: MA(1.5 cun length needle)	1. Clinical efficacy: $p<0.05$
Jin(2015)[70]	RCT	60(30/30)	Rome Diagnosis	A: Acupuncture	B: SA(non acupoint)	1. Within intervention group A=B 1) PFP<0.0001 2) ESP<0.0001 3) DSSSP<0.0001 4) DSSSf-upP<0.0001 2. Withininterventiongroup(B>A) 1) EPP<0.0001 2) EBSP<0.0001 3) SF-36P<0.0001 4) SDSP<0.0001 5) SASP<0.0001
Kim(2015)[71]	RCT	76(37/39)	Rome Diagnosis	A: MA	B: No intervention	1. PR: $p<0.001$ 2. Dyspeptic Symptom VAS: $p<0.001$ 3. NDI: $p<0.05$
Liu(2015)[72]	RCT	68(34/34)	Rome Diagnosis	A: MA	B: Medication	1. Clinical efficacy: $p<0.05$ 2. Symptom: $p<0.05$ 3. Ghrelin: $p<0.05$
Pan(2015)[73]	RCT	112(56/56)	Rome Diagnosis	A: MA+medication	B: Medication	1. Clinical efficacy: $p<0.05$ 2. Symptom: $p<0.05$ 3. EGG(MFC, AC): $p<0.05$
Ren(2015)[74]	RCT	68(34/34)	Rome Diagnosis, Chinese Diagnosis III	A: MA	B: Medication	1. Clinical efficacy: $p<0.05$ 2. Symptom: $p<0.05$ 3. Ghrelin: $p<0.05$
Wang(2015)[75]	RCT	158(85/73)	Symptom, Syndrome differentiation	A: Warm acupuncture+ medication	B: Medication	1. Clinical efficacy: $p<0.05$.
Wang(2015)[76]	RCT	80(40/40)	Rome Diagnosis	A: MA+moxibustion+ medication	B: Herbal medicine (symptom differentiation)	1. Symptom: $p<0.05$ 2. Satisfied degree: $p<0.05$ 3. SDS: $p<0.05$ 4. Follow-up visit: $p<0.05$.
Wang(2015)[77]	RCT	68(34/34)	Chinese Diagnosis I	A: MA	B: Medication	1. Clinical efficacy: NS 2. Abdominal pain: $p<0.05$
Wang(2015)[78]	RCT	68(34/34)	Rome Diagnosis	A: MA	B: SA(placebo acupoints)	1. Clinical efficacy: $p<0.05$ 2. NDI: $p<0.05$

Table 1. Continued

Author(year)	Study design	Number of subjects Total(int/cont)	Inclusion criteria	Intervention group	Control group	Results(Between A and B)
Xiong(2015)[79]	CCT	124(62/62)	Symptom	A: MA+moxa burner moxibustion	B: Medication	1. Clinical scores: $p<0.05$ 2. Symptom: $p<0.05$
Xu(2015)[80]	RCT	93(47/46)	Chinese Diagnosis II	A: MA	B: Medication	1. Total efficacy: $p<0.05$ 2. Symptom: $p<0.05$ 3. EGG(MFC, AC): $p<0.05$ 4. NDI: $p<0.05$
Yuan(2015)[81]	RCT	63(31/32)	Rome Diagnosis	A: MA	B: Medication	1. HAMD: $p<0.01$ 2. HAMA: $p<0.05$ 3. Clinical efficacy: $p<0.05$ 4. Gas: $p<0.05$

AA : Auricular Acupuncture, AC : contraction Amplitude Value, BDI : Beck Depression Inventory, CCT : Controlled Clinical Trials, EA : ElectroAcupuncture, EGG : ElectroGastroGram, FD : Functional Dyspepsia, FD-QOL : Functional Dyspepsia-related Quality Of Life, GAS : GAStric emptying time , GSRS : Gastrointestinal Symptom Rating Scale, HAMA : HAMilton Anxiety scale, HAMD : HAMilton Depression scale, HR-QOL : Health-Related Quality Of Life, MA : Manual Acupuncture, MFC : Mean Systolic wave Frequency, MTL : the plasma MoTiLin, NDI : Nepean Dyspepsia Index, NDI-K : Nepean dyspepsia index questionnaire-Korean, NDLQI : Nepean Dyspepsia Life Quality Index, NDSI : Nepean Dyspepsia Symptom Index, PR : Proportion of Responder, QOL : Quality Of Life, RCT : Randomized Clinical Trial, SA : Sham Acupuncture, SAS : Self-rating Anxiety Scale, SDS : Self-rating Depression Scale, VAS : Visual Analogue Scale.

의 배경(Practitioner Background) 항목을 분석하였다(Table 1, 2).

결 과

1. 검색 및 자료선정

본 연구의 검색전략을 통해 총 4,441편의 논문이 도출되었고, 중복제거 후 3,845편이 포함되었다. 이를 대상으로 1차적으로 각 논문들의 제목과 초록 등을 검토하여 선정조건에 해당하는 논문을 추출한 결과, 213편의 논문이 포함되었으며, 논문의 원문을 모두 확보하여 전문검토를 통해 최종 117편의 문헌을 선정하였다(Fig. 1).

2. 기능성 소화불량에 대한 침구요법 연구의 일반적 특성

1) 연구 설계 및 표본 수: 총 117편의 연구 중 무작위대조군 임상연구가 111편(95%), 대조군 임상연구가 6편(5%)이었다. 연구대상자 수는 16명부터 260명까지 다양하였으며 평균 83.54명이고 100명 미만의 연구는 53편(76%), 100명 이상의 연구는 17편(25%)에 해당하였다.

2) 선정기준: 기능성 소화불량증에 대한 연구대상 선정기준으로는 Rome Diagnosis의 진단기준을 사용한 것이 76편(65%)으로 가장 많았으며 그 다음으로 중의학 진단기준 Chinese Diagnosis을 사용한 18편(15%), 증상을 진단기준으로 사용한 17편(14%), 그 외 Rome Diagnosis와 Chinese Diagnosis의 진단기준을 병행하여 사용한 6편(5%) 순으로 나타났다.

3) 중재군 및 대조군: 최종 선정된 전체 117편의 논문 중 침(Manual Acupuncture) 연구는 68편(59%)으로 절반 이상을 차지하였으며 그 다음으로 전침(Electro Acupuncture) 29편(25%), 뜸(Moxibustion) 11편(9%), 매선요법(Acupoints Embedding Therapy) 5편(4%), 약침요법(Acupoint injection Therapy) 4편(3%)으로 나타났다. 침 전체 68편 중에서 수기침 단독의 중재를 사용한 연구는 50편(74%)으로 나머지는 모두 그 외 전침이나 뜸, 부항, 약침 등을 병행 사용한 것으로 나타났다. 수기침 단독의 중재를 사용한 연구에서 한양방 소화불량 약재치료를 사용한 대조군은 29편(43%)이며 플라시보 대조군은 17편(25%)이였고 대조군이 없는 연구는 4편(5%)이었다. 그 외 침과 부항이나 뜸, 한약, 양약 등의 복합적 중재를 사용한 연구는 17편(24%)으로 모두 약물치료를 대조군으로 설정하였고 이 중 16편(95%)의 논문에서 약물로는 위장운동조절 및 진경제(Domperidone, Clebopride, Mosapride, Itopride Hydrochloride)와 프로톤 펌프 저해제(Rabeprazole, Lansoprazole, Esomeprazole) 등이 사용되었으며 1편(5%)의 연구에서 한약으로

Table 2. Characteristics of Articles of Electro Acupuncture, Moxibustion, pharmacoacupuncture Treatment for Functional Dyspepsia

Author(year)	Study design	Number of subjects Total(int/cont)	Inclusion criteria	Intervention group	Control group	Results
Thitiphuree(1999)[82]	RCT	20(n.r.)	Symptom	A: EA	B: SA(no electrical stimulation)	1. VAS(nonspecific): $p<0.05$
Chen(2004)[83]	RCT	90(30/30/30)	Chinese Diagnosis 1	A: EA	B: Medication C: Placebo(tablet)	1. Symptom: $p<0.001$ 2. EGG: $p<0.01$ 3. Symptom: $p<0.01$ 4. EGG: $p<0.01$ 5. EGG: NS. symptom: not reported
Shi(2004)[84]	CCT	60(35/25)	Chinese Diagnosis 2	A: Moxibustion	B: Medication	1. Clinical efficacy: $p<0.05$
Miao(2004)[85]	RCT	70(37/33)	Symptom	A: Acupoint-injection.	B: Medication	1. Clinical efficacy: $p<0.05$ 2. Symptom: $p<0.01$
Yao(2006)[86]	RCT	60(30/30)	Rome Diagnosis (induced by mechanical gastric distention)	A: EA	B: No intervention	1. MDP: $p>0.05$ 2. Initial volume and pressure: $p<0.05$ 3. Maximal tolerate volume and pressure: $p<0.05$ 4. Compliance: $p<0.05$
Yao(2006)[87]	RCT	30(19/11)	Rome Diagnosis (induced by mechanical gastric distention)	A: EA	B: No intervention	1. Within group A 1) LF/HF: $p<0.05$ 2) LF: $p<0.05$ 3) HF: $p<0.05$ 4) maximal tolerable volume and pressure: $p<0.05$ 2. WithingroupB 1) NS
Huang(2006)[88]	RCT	100(50/50)	Chinese Diagnosis 2	A: Moxibustion plaster therapy+medication	B: Medication	1. Clinical efficacy: $p<0.05$ 2. Symptom: $p<0.05$
Choi(2007)[89]	RCT	38(18/20/32)	Rome Diagnosis	A: EA	B: SA(non acupoint)	1. Slow wave Stimulation: $p<0.05$(A>B)
Wang(2007)[90]	RCT	50(30/20)	Rome Diagnosis	A: EA+auricular point magnetic therapy	B: Medication	1. Symptom: $p<0.05$ 2. EGG: NS 3. Clinical efficacy: $p<0.05$
Liu(2008)[91]	RCT(double-blinded randomized crossover trial)	27	Rome Diagnosis	A: TENS	B: Sham TENS(non acupoint) C: Control(no electro stimulation)	1. HF: $p>0.05$(A>B, C) 2. LF/HF ratio: $p>0.05$(A<B, C)

Table 2. Continued

Author(year)	Study design	Number of subjects Total(int/cont)	Inclusion criteria	Intervention group	Control group	Results
Peng(2008)[92]	RCT	40(20/20)	Rome Diagnosis	A: EA	B: Medication	1. Within group A 1) symptom: $p<0.05$ 2) SADS: $p<0.05$ 3) HRV(HF, LF/HF): $p<0.05$ 4) gastro-electricfrequency: $p<0.05$ 5) NPY, motilin: $p<0.05$ 2. WithingroupB 1) symptom: $p<0.05$ 2) gastro-electricfrequency: $p<0.05$ 3) motilin: $p<0.05$
Yao(2009)[93]	RCT	60(30/30)	Rome Diagnosis	A: EA	B: SA(non-penetrating)	1. Maximal tolerable volume and pressure: $p<0.05$
Zhou(2009)[94]	RCT	250(125/125)	Rome Diagnosis	A: TEAS+placebo medication	B: Sham TEAS(placebo acupoints)+medication	1. Symptom: $p<0.05$ 2. MTL: $p<0.05$ 3. SS: $p<0.05$
Liu(2010)[95]	RCT	358(190/168)	Chinese Diagnosis 1	A: Acupoints embedding therapy	B: Medication	1. Clinical efficacy: $p<0.05$
Lu(2011)[96]	RCT	80(40/40)	Rome Diagnosis	A: Acupoints embedding therapy+herbal medicine	B: Medication	1. Clinical efficacy: $p<0.05$ 2. Post-prandial normal slow wave: $p<0.05$
Xie(2011)[97]	RCT	60(30/30)	Rome Diagnosis	A: EA	B: SA(placebo acupoint)	1. Clinical efficacy: $p<0.05$
Yang(2011)[98]	RCT	60(30/30)	Rome Diagnosis	A: EA	B: Medication	1. Quality of life: $p<0.05$
Liu(2011)[99]	CCT	142(90/52)	Rome Diagnosis	A: Moxibustion	B: No treatment	1. Symptom: $p>0.05$ 2. Gas: $p<0.05$ 3. MTL: $p>0.05$
Yang(2011)[100]	RCT	46(23/23)	Rome Diagnosis	A: Moxibustion	B: Medication	1. Symptom: $p<0.05$ 2. Clinical efficacy: $p<0.05$
Hu(2011)[101]	RCT	90(30/30/30)	Rome Diagnosis	A: Moxibustion+medication	B: Moxibustion C: Medication	1. Clinical efficacy: $p<0.05$ 2. Clinical efficacy: $p<0.05$
Wang(2012)[102]	RCT	116(36/39/41)	Rome Diagnosis	A: EA(special acupoint in foot yangming meridian)	B: EA(non-specific acupoint in foot yangming meridian) C: EA(non acupoint)	1. Total efficacy: A>B>C, $p<0.05$ 2. FDI: $p<0.05$ 3. SF36: $p<0.05$
Sheng(2013)[103]	RCT	100(50/50)	Rome Diagnosis	A: EA	B: Medication	1. NDSI, FDI: $p<0.05$ 2. NDLQI: $p<0.05$ 3. CCK: $p<0.05$ 4. Neuropeptide: $p<0.05$
Wang(2013)[104]	RCT	80(40/40)	Chinese Diagnosis 2	A: Moxibustion	B: Medication	1. Clinical efficacy: $p<0.05$ 2. Symptom: $p<0.05$

Table 2. Continued

Author(year)	Study design	Number of subjects Total(int/cont)	Inclusion criteria	Intervention group	Control group	Results
Zeng(2013)[105]	RCT	80(40/40)	Rome Diagnosis	A: Acupoints embedding therapy	B: Medication	1. Clinical efficacy: $p<0.05$
Xu(2013)[106]	RCT	60(30/30)	Symptom	A: Acupoint-injection+ Moxibustion	B: Medication	1. Clinical efficacy: $p<0.05$
Li(2014)[107]	RCT	70(35/35)	Rome Diagnosis	A: EA	B: Medication	1. Symptom post treatment: $p<0.05$ 2. QoL NDI post treatment: $p<0.05$ 3. Symptom 1,2,3,4,5 months f-u: $p<0.01$ 4. QoL NDI 1,2,3,4,5 months f-u: $p<0.01$
Li(2014)[108]	RCT	71(35/36)	Rome Diagnosis	A: EA	B: SA(non acupoint)	1. LDQ score: $p<0.05$
Ma(2014)[109]	RCT	105(35/35/35)	Rome Diagnosis	A: EA	B: MA C: SA(placebo acupoints)	1. Clinical efficacy: 0.05
Ma(2014)[110]	RCT	105(35/35/35)	Rome Diagnosis	A: EA(syndrome differentiation acupoint)	B: EA(regular acupoint) C: SA(non acupoint)	1. Symptom: $p<0.05$ 2. SF-36: $p<0.05$ 3. NDSI: $p<0.05$ 4. NDLQI: $p<0.05$
Yang(2014)[111]	RCT	80(40/40)	Rome Diagnosis	A: EA	B: Medication	1. Clinical efficacy: $p<0.05$
Yeo(2014)[112]	RCT	30(15/15)	Symptom	A: EA(3 Hz)	B: EA(300 Hz)	1. Pain(VAS): $p=0.001$ in both group 2. Pressure algometer: $p<0.05$ in both group 3. Pressure algometer: NS between group
Ji(2014)[113]	RCT(single-blind randomized crossover trial)	56(28/28)	Rome Diagnosis	A: TENS	Sham TENS(non acupoint)	1. Dyspeptic symptom: $p<0.01$ 2. QOL(VT): $p<0.01$, 3. QOL_GH, SF, RE: $p<0.01$ 4. SAS: $p<0.05$ 5. SDS: $p<0.01$ 6. The percentage of normal gastric slow wave: $p<0.01$ 7. TSV: $p<0.01$, 8. MTV: $p<0.001$ 9. Gastric emptying rate: $p<0.001$
Liu(2014)[114]	RCT	60(30/30)	Rome Diagnosis	A: Moxibustion+ medication	B: Medication	1. Symptom: $p<0.05$
Dan(2014)[115]	RCT	60(30/30)	Symptom	A: Moxibustion	B: Medication	1. Clinical efficacy: $p<0.05$
Fu(2014)[116]	RCT	92(46/46)	Rome Diagnosis	A: Moxibustion	B: Medication	1. Clinical efficacy: $p<0.05$ 2. Symptom: $p<0.05$ 3. Side effect: $p>0.05$
Zhang(2014)[117]	RCT	90(30/30/30)	Rome Diagnosis	A: Acupoints embedding therapy+medication	B: MA+medication C: Medication	1. Clinical efficacy: $p<0.05$ 2. EGG: $p<0.05$ 3. Clinical efficacy: $p<0.05$ 4. EGG: $p<0.05$

Table 2. Continued

Author(year)	Study design	Number of subjects Total(int/cont)	Inclusion criteria	Intervention group	Control group	Results
Zhou(2014)[118]	RCT	60(30/30)	Rome Diagnosis	A: Acupoint-injection.	B: MA	1. Clinical efficacy: $p<0.05$ 2. Symptom: $p<0.05$ 3. NDI: $p<0.05$ 4. MTL: $p<0.05$
Liu(2015)[119]	RCT	70(35/35)	Rome Diagnosis	A: EA(specific acupoints of stomach meridian)	B: EA(non-specific acupoints of stomach meridian)	1. SDS: $p<0.05$ 2. SAS: $p<0.05$ 3. Quality of life: $p<0.05$
Ma(2015)[120]	RCT	230(116/114)	Rome Diagnosis	A: EA(specific acupoints of stomach meridian)	B: EA(non-specific acupoints)	1. Symptom: $p<0.05$
Yang(2015)[121]	RCT	70(34/36)	Rome Diagnosis	A: EA(syndrome differentiation acupoint)	B: EA(ordinary acupoint)	1. GAS, MTL: $p<0.05$ 2. SF-36: $p<0.05$ 3. NDSI, NDLQI: $p<0.05$
Zhao(2015)[122]	RCT	180(60/60/60)	Chinese Diagnosis 1	A: EA	B: Medication C: Herbal medicine(Chai Hu Shu Gan)	1. Clinical efficacy: $p<0.05$ 2. Clinical efficacy: $p<0.05$
Zhang(2015)[123]	RCT	635(158/159/158/160)	Rome Diagnosis	A: EA	B: Herbal medicine C: Herbal medicine+EA D: Medication	1. Symptom: $p<0.05$ (group C>A, B, D) 2. QOL: $p<0.05$(group C>A, B, D) 3. Plasma motilin: $p<0.05$ (group C>A, B, D) 4. Electrogastrogram: $p<0.05$ (group C>A, B, D) 5. Effective rate: $p<0.05$ (group C>A, B, D and group A>B, D)
Ma(2015)[124]	RCT	712(116/120/114/119/118/119)	Rome Diagnosis	A: EA(specific acupoints of stomach meridian) B: EA(non-specific acupoints of stomach meridian) C: EA(specific acupoints of alarm and transport points) D: EA(specific acupoints of gallbladder meridian)	E: SA(non acupoint) F: Medication	1. PDS: $p<0.05$(A>B, C, D) 2. NDI: $p<0.001$(A, B, D, P) 3. QoL: $p<0.001$(A, C) 4. Symptom index: $p<0.001$(All) 5. Score: $p<0.05$(A, B, C, D, F) 6. Symptom effect: $p<0.001$ (A, B, C>D)
Yi(2015)[125]	RCT	72(36/36)	Rome Diagnosis	A: Moxibustion	B: Medication	1. Clinical eficacy: $p<0.05$
Li(2015)[126]	RCT	122(61/61)	Symptom	A: Moxibustion	B: Medication	1. Clinical efficacy: $p<0.05$
Yan(2015)[127]	RCT	100(50/50)	Symptom	A: Acupoints embedding therapy+medication	B: Medication	1. Clinical efficacy: $p<0.05$
Fan(2015)[128]	RCT	84(42/42)	Rome Diagnosis, Chinese Diagnosis 2	A: Acupoint-injection+ Chinese herbal medicine	B: Medication	1. Clinical efficacy: $p<0.05$ 2. Symptom: $p<0.05$

AA : auricular acupuncture, EA : electroacupuncture, MA : manual acupuncture, TEA : transcutaneous electroacupuncture.

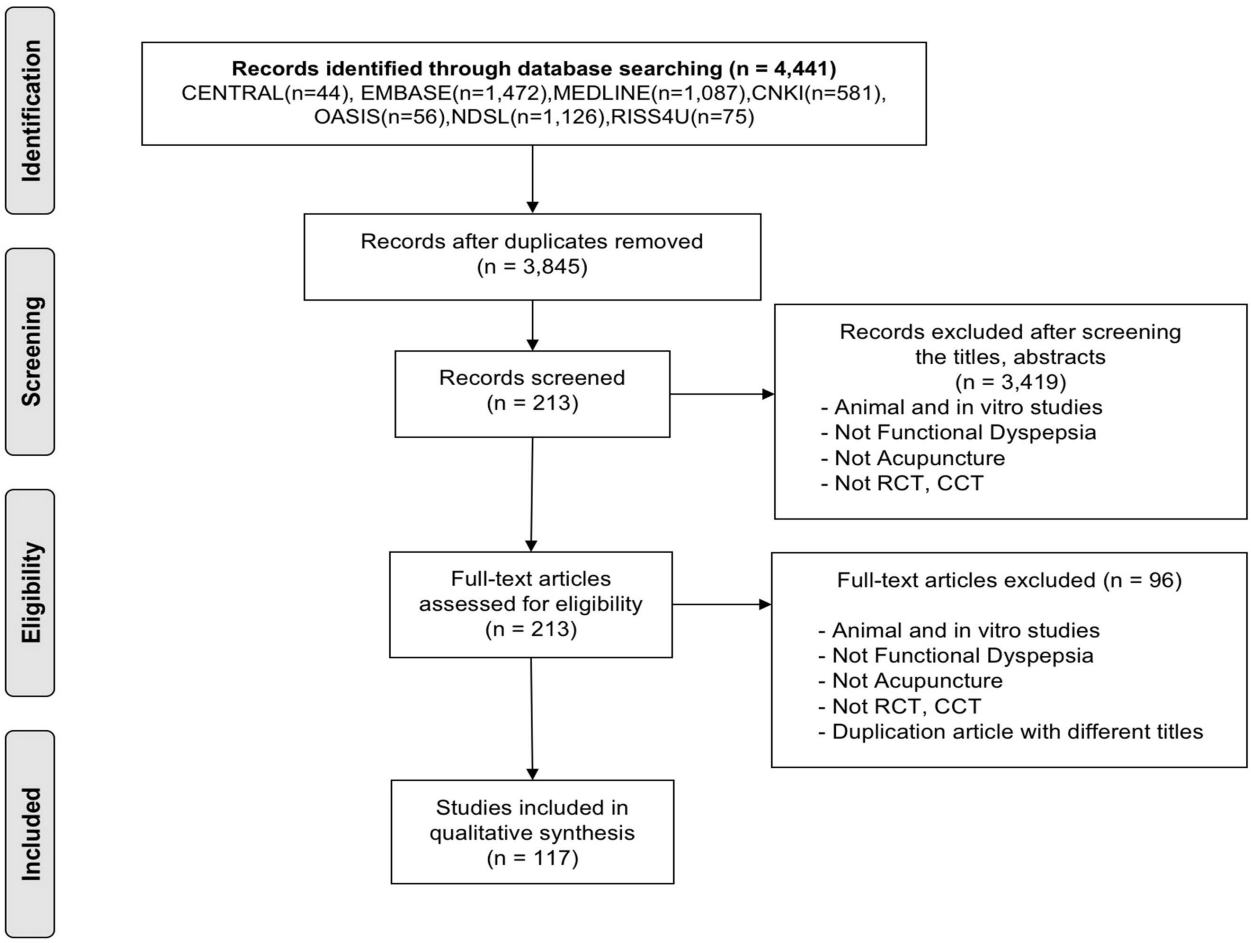

Fig. 1. Flowchart of Study Selection.

반하사심탕과 청위단을 사용하였다.

전침을 중재[8]로 한 총 29편의 논문에서는 약물 대조군 11편(38%), 가짜 침 대조군 12편(42%), 플라시보 대조군 3편(10%), 비중재군 2편(7%), 한약재 중재군 1편(3%)으로 나타났다.

뜸을 중재로 한 11편의 논문에서는 약물 대조군 10편(90%), 비중재군 1편으로 나타났고 그 외 매선요법 중재로 한 5편의 논문에서는 모두 약물 대조군을 사용하였다. 약침요법을 중재로 한 4편의 논문에서는 수기침을 대조군으로 한 1편의 연구를 제외하고 3편의 논문에서 약물 대조군을 사용하였다.

4) 평가변수: 기능성 소화불량에 대한 침구치료에 대한 유효성을 평가하기 위하여 사용된 평가변수는 총 65가지로 나타났다. 크게 소화불량으로 일어나는 증상과 관련된 변수, 소화불량에 영향을 끼치는 스트레스, 우울증 관련 변수, 삶의 질 관련 변수, 위전도 변수, 혈중 Ghrelin, Motilin 과 같은 변수로 나눌 수 있었다. 그 중 가장 많이 사용된 평가변수는 임상적 유효성(Clinical Efficacy)이 62편(53%)에서 사용되었고 두 번째로는 Symptoms으로 기능성 소화불량의 진단기준에 해당하는 증상의 소멸 및 감소된 값을 살펴보았으며 50편(43%)의 논문에서 사용되었다. 그 외로는 EGG(Electrogastrogram), SF-36(Short Form 36)을 이용한 삶의 질 평가변수, 소화불량 관련 증상관련 설문 점수가 사용되었으며 그 외로 Gastric emptying time, Ghrelin, MTL(Motilin) 등 각 논문 별로 소화기능을 확인할 수 있는 다양한 결과변수들이 사용되었다.

3. 기능성 소화불량에 대한 침구치료방법

1) 기능성 소화불량에 대한 침요법: 수기침, 전침, Acupuncture Injection 및 Warm Acupuncture를 모두 포함한 106편 중 70편(66.0%)에서는 자침깊이를 보고하지 않았고, 36편(34.0%)에서는 자침깊이를 보고하였다. 21편은 cm로, 15편을 寸으로 깊이 단위를 보고하였으며, 전체 36편 중 16편에서는 혈자리마다 다른 자침깊이를 사용하였다. 자침깊이는 0.4～5 cm, 0.5～2寸으로 다양하였

Table 3. Intervention Characteristics of Articles of Acupuncture Therapy for Functional Dyspepsia

Author (year)	Type of intervention	Insertion depth	Deqi achievement	Details of stimulation	Retention time	Needle type (diameter×length)	Treatment frequency	Duration	Acupuncture points	Practitioner background
Manual acupuncture										
Chu(1994)[16]	MA	n.r.	n.r.	Manual stimulation (every 5 min)	15 min	n.r.	Once/day	5 days/session, 4 session	CV12, ST36, ST25	n.r.
Chen(1998)[17]	MA	n.r.	Achieved	Manual stimulation (once)	20 min	n.r.	Once/day	10 times/session, 2 session	A: ST36, CV12 B: PC6, BL21	n.r.
Chen(2000)[18]	MA	1~1.5 cun	n.r.	Manual stimulation (twirling, lifting and thrusting)	30 min	n.r.×1.5 cun	Once/day	2 weeks	ST36, CV12, PC6, LR3, GB342 ST36, LR3, GB34, TE5, LR143 ST36, PC6, CV12, SP6, LR13, BL20, BL21	n.r.
Liu(2001)[19]	MA	n.r.	Achieved	Manual stimulation (once)	30 min	0.38 mm×n.r	Once/day	10 days/session, 3 session	CV12, ST36, PC6, LI4, BL21, BL20, LR3, CV6, CV4, ST25	n.r.
Liu(2002)[20]	MA+AA	n.r.	n.r.	Manual stimulation (every 5 in)Auricular treatment(several times)	30 min	0.32 mm×1.5 cun	MA: once/ dayAA: once/ 5 days	MA: 10 days/ session, 3 sessionAA: 6 session	Acupuncture: CV12, ST25, ST36, LI4, LR3 Auricular: liver, spleen, Stomach, sympathy, Shenmen, pizhixia	n.r.
Wang(2002)[21]	MA	3~5 cun	Achieved	Manual stimulation (twirling lifting and thrusting)	20 min	0.4 mm×6 cun	Once/day	5 days/session, 2 session	Main acupoint: CV12 Matching acupoints: LR3, ST36	n.r.
Shi(2003)[22]	MA+ cupping	n.r.	Achieved	Manual stimulation (every 10 min)	30 min	0.32 mm×1.5 or 2.5 cun	Once/day	8 days/session, 3 session	Main points: BL18, BL19, BL20, BL21, T9-12; Matching point: CV12, ST25, PC6, ST36, ST21, LR3, CV6, SP4, CV12, ST25	n.r.
Feng(2004)[23]	MA+AA	n.r.	Achieved	n.r.	30 min	n.r.×1.5 cun	MA: once/ dayAA: once/ 3 days	4 weeks	Acupuncture: ST36, CV12, PC6, LR3; Auricular: Stomach, spleen, liver, shenmen, sympathy	n.r.
Li(2004)[24]	MA	n.r.	Achieved	Manual stimulation (reinforcing-reducing method)	30 min	0.32/0.34/0.38 mm×n.r.	Twice/day	4 weeks	Main points: ST36, PC6 Matching points: BL18, BL15, BL15, HT5, BL23, CV4, CV3, SP6, CV6, BL17, BL15	n.r.
Zhang(2004)[25]	MA	n.r.	n.r.	Manual stimulation (reinforcing-reducing method)	30 min	n.r.×1 cun	Once/day	10 days/session, 3 session	ST36, PC6, CV12, LR3, BL21, BL20, BL25	n.r.
Zhou(2004)[26]	MA	n.r.	n.r.	Manual stimulation (reinforcing-reducing method)	20 min	n.r.	Once/day	21 sessions	CV12, PC6, ST36, SP6, LI4	n.r.

Table 3. Continued

Author (year)	Type of intervention	Insertion depth	Deqi achievement	Details of stimulation	Retention time	Needle type (diameter×length)	Treatment frequency	Duration	Acupuncture points	Practitioner background
Chen(2005)[27]	MA	n.r.	n.r.	n.r.	20 min	n.r.	Once/day	7 days	ST36, PC6, CV12	n.r.
Xu(2005)[28]	MA	n.r.	Achieved	Manual stimulation (twirling, reinforcement-reduction)	30 min	0.38 mm×n.r.	Once/day	10 days/session, 3 session	BL20, BL21, CV12, ST25, CV6, PC6, SP4, ST36	n.r.
Park(2007)[29]	MA	10~25 mm	Achieved	Manual stimulation	15 min	0.25×30 mm	3 times/week	2 weeks	CV12, LI14, LR3, ST36, PC6, SP4	Licensed oriental medical doctor with experience more than 3 years
Oh(2008)[30]	MA	n.r.	Not achieved	None	20 min	0.3×30 mm	Once/ 12 hours	48 hours	LI4, LR3	n.r.
Wang(2008)[31]	MA	n.r.	n.r.	n.r.	30 min	n.r.	Once/day	3 days	ST36	n.r.
Park(2009)[32]	MA	10~25 mm	n.r.	Manual stimulation	15 min	0.25×30 mm	3 times/ week	2 weeks	LI4, LR3, ST36, PC6, SP4, CV12	At least 3 years of clinical experience
Wong(2009)[33]	MA	n.r.	n.r.	n.r.	n.r.	n.r.	Twice/week	4 weeks	ST36, PC6, CV12	Nationally accredited acupuncturists
Yang(2009)[34]	MA	n.r.	Achieved	Manual stimulation	30 min	n.r.×25~50 mm	Once/day	7 days/session, 2 session	ST42, ST40, ST36, ST34	n.r.
Chang(2010)[35]	MA	n.r.	Achieved	Manual stimulation (twirling, reinforcement-reduction)	30 min	0.30× (25~50) mm	Once/day	5 day/session, 4 session	ST42, ST40, ST36, ST34	n.r.
Lan(2010)[36]	MA	n.r.	Achieved	Manual stimulation (twirling, reinforcement-reduction)	30 min	0.30× (25~50) mm	Once/day	6 days/session, 4 session	ST42, ST40, ST36, ST34	n.r.
Lan L-30 (2010)[37]	MA	n.r.	Achieved	Manual stimulation (twirling, reinforcement-reduction)	30 min	0.30× (25~50) mm	Once/day	7 days/session, 4 session	ST42, ST40, ST36, ST34	n.r.
Li(2010)[38]	MA+warm acupuncture	n.r.	Achieved	Manual stimulation (twirling, reinforcement-reduction)	30 min	0.35×40 mm	Once/day	10 days/session, 1~3 session	CV12, ST25, CV10, CV4, ST36, PC6.	n.r.
Li(2010)[39]	Finger acupunture	NA	Achieved	n.r.	1~5 min	N.A.	6 times/week	14 days	Main acupoints: CV12, PC6, ST36 Matching acupoints: CV10, CV13, CV4, KI21, ST19, ST20	n.r.
Ren(2010)[40]	MA	n.r.	n.r.	n.r.	30 min	n.r.	Once/day	3 days	ST36	n.r.
Shi(2010)[41]	MA+ moxibustion	15~25 mm	n.r.	Manual stimulation (reinforcing-reducing)	Needling: 30 min; Moxibustion: 20 min	0.25×25/40 mm	Once/day	5 days/session, 4 session	CV12, ST36, PC6, SP6	n.r.

Table 3. Continued

Author (year)	Type of intervention	Insertion depth	Deqi achievement	Details of stimulation	Retention time	Needle type (diameter×length)	Treatment frequency	Duration	Acupuncture points	Practitioner background
Wu(2010)[42]	MA	n.r.	Achieved	Manual stimulation (twirling, reinfo-rcement-reduc tion)	30 min	0.32×40/50/65 mm	Once/day	8 days/session, 3 session)	Main acupoints: LR3, PC6, BL18, CV12, ST36, BL21 Matching acupoints: GV20, EX-HN1, HT7	n.r.
Chen(2011)[43]	MA	n.r.	n.r.	n.r.	30 min	n.r.	Once/day	4 weeks	ST36, PC6	n.r.
Lin(2011)[44]	AA	N.A.	n.r.	N.A.	3 min/day	Pearls press	3 times/day	4 weeks	Er Shenmen(MA-TF 1) Spleen(MA-IC), Stomach(MA-IC), Liver(MA-SC5)	n.r.
Lin(2011)[45]	AA	N.A.	n.r.	N.A.	3 min/day	Magnetic pearls	Once/4 days	4 weeks	Er Shenmen(MA-TF 1), Spleen(MA-IC), Stomach(MA-IC), Liver(MA-SC 5).	n.r.
Liu(2011)[46]	MA	n.r.	Achieved	Manual stimulation (reinforcing-red ucing method)	20~30 min	n.r.	n.r.	4 weeks	PC6, ST36, ST25	n.r.
Yang(2011)[47]	MA	n.r.	Achieved	Manual stimulation (reinforcing-red ucing method)	30 min	n.r.	Once/day	5 days/session, 4 session	CV12, ST25, PC6, ST36	Professional acupunctu rist
Zhang(2011)[48]	MA	1.2~1.8 cun	Achieved	Manual stimulation (reinforcing-red ucing method)	20 min	0.32×1.5/2 cun	3 times/weeks	4 weeks	GV24, GB13, CV12, ST36, PC6	n.r.
Chen(2012)[49]	MA	n.r.	n.r.	n.r.	30 min	n.r.	Once/day	4 weeks	PC6, ST36	n.r.
Guo(2012)[51]	MA	n.r.	n.r.	Manual stimulation (twirling lifting and thrusting)	30 min	30 hao 1, 1.5/2 cun	Once/day	5 days/session, 4 session	CV12, CV10, CV6, CV4, ST25, ST36, ST44, SP4, SP9, LR3, GB34, GV20, GV24, PC6, Yintang (Ex-HN-3)	n.r.
He(2012)[51]	MA	n.r.	Achieved	n.r.	15~30 min	n.r.	Once/day	4 weeks	ST36, ST44, LR3, PC6, BL15, BL18, BL20, BL21	n.r.
Liao(2012)[53]	MA	n.r.	Achieved	Manual stimula-tion(lifting for 15 min)	15~20 min	CV14: 180 mm others: n.r.	Once/day	10 days/session, 3 session	CV14, KI16, ST36, PC6	n.r.

Table 3. Continued

Author (year)	Type of intervention	Insertion depth	Deqi achievement	Details of stimulation	Retention time	Needle type (diameter×length)	Treatment frequency	Duration	Acupuncture points	Practitioner background
Liu(2012)[54]	MA	0.5~1.5 cun	Achieved	n.r.	30 min	No.30×1~2 cun	Once/day	6 day/session, 2 session	Main: CV12, ST25, ST36 Side: BL18, LR3, LR14, BL20, BL21, CV4, CV6, GB34, SP9, ST44, LI11	n.r.
Wang(2012)[55]	MA	4~40 mm	Achieved	Manual stimulation (twirling lifting and thrusting, reinforcing-reducing)electro stimulation (2 Hz/100 Hz, 0.1-1 mA)	30 min	0.25×25~50 mm; 0.18×15 mm	Once/day	5 days/session, 4 session	ST42, ST40, ST36, ST34, ST38, ST33, ST32, ST35	n.r.
Huang(2013)[56]	MA	0.5~1 cun	Achieved	Manual stimulation (twirling lifting and thrusting)	20 min	No.30×1~1.5 cun	Once/day	6 days/session, 2 session	CV12, ST25, ST36, CV17, LR13, BL20, BL21, LR12, LR3, SP9, ST44 (syndrome differentiation)	n.r.
Jin(2013)[57]	MA	n.r.	n.r.	Manual stimulation (twirling lifting and thrusting)	30 min	n.r.	Once/day	6 days/session, 2 session	Main: CV12, ST25, PC6, ST36 Side: CV17, LR13, BL20, BL21, LR14, LR3, ST44, SP9	n.r.
Lee(2013)[58]	MA+Acupoint injection	n.r.	n.r.	MA: n.r.Inject 0.8cc	15 min	0.25×40 mm; 0.3 mm×8 mm	3 times/week	2 weeks	MA: LI4, LR3, LI11, ST36, CV12, CV10 Acupoint injection: ST19, ST27, ST25, BL18, BL20, BL21, BL23	n.r.
Lima(2013)[59]	MA	n.r.	n.r.	n.r.	n.r.	0.4×70 mm	3 times/week	4 weeks	A: PC6, LI4, CV12, ST36, L3, ST44 B: PC5, LI3, CV11,ST35, L2, ST43	Experienced researcher
Shi(2013)[60]	MA	n.r.	Not achieved	Manual stimulation (twirling lifting and thrusting)	30 min	n.r.	Once/day	5 days/session, 1 month	CV12, CV10, CV4, CV6, SP15	n.r.
Zheng(2013)[61]	MA+warm acupuncture	n.r.	Achieved	Manual stimulation	30 min	0.25×40 mm	Once/day	1 month	ST36, PC6, CV12, LING GU	n.r.
Li(2014)[62]	MA	0.5~1 cun	Achieved	Manual stimulation (twirling lifting and thrusting, 2min for every 10 min)	30 min	n.r.	Once/day	2 weeks/session, 2 session	ST36, PC6, CV12	n.r.
Shui(2014)[63]	MA	n.r.	Achieved	n.r.	30 min	n.r.×40 mm	Once/day	3 weeks	SP6, SP9, TE6	n.r.
Yu(2014)[64]	MA	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.	4 weeks	CV12, ST36, SP9, ST21, CV10	n.r.

Table 3. Continued

Author (year)	Type of intervention	Insertion depth	Deqi achievement	Details of stimulation	Retention time	Needle type (diameter×length)	Treatment frequency	Duration	Acupuncture points	Practitioner background
Zhang(2014)[65]	MA	1~1.5 cun	Achieved	Manual stimulation (reinforcing-reducing)	30 min	n.r.	Once/day	4 weeks	CV12, ST36, LR3, PC6	n.r.
Zhang(2014)[66]	MA	n.r.	n.r.	Manual stimulation (twirling lifting and thrusting)	30 min	n.r.× 25~50 mm	Once/day	10 days/session, 2 session	ST36, PC6, CV12	n.r.
Zhou(2014)[67]	MA	n.r.	n.r.	Manual stimulation (twirling lifting and thrusting)	30 min	n.r.	Once/day	6 days/session, 2 session	CV12, ST25, PC6, ST36, CV17, LR13, BL20, BL21, LR12, LR3, SP9, ST44	n.r.
Hu(2015)[69]	MA	2 cun	Achieved	Manual stimulation (reinforcing-reducing)	30 min	2.5 cun	Once/day	5 days/session, 2 session	Wei Guan Xia Shu, BL21, BL18, BL19, BL20	n.r.
Jin(2015)[70]	MA	25 mm	Achieved	Manual stimulation (lifting, thrusting, twirling)	20~60 min	0.35×25 mm	3~4 times/week	1 month	Treatment: ST36, K13, GB4, PC6, HT7 Control: KI13, ST36, GB41,PC6, HT7	n.r.
Kim(2015)[71]	MA	5~30 mm	Achieved	Manual stimulation (needle rotation)	15 min	0.25×40 mm	Twice/week	4 weeks	LI4, ST36, SR3, SP4, CV12+additional point (headache: EX-HN5; shoulder or back pain: GB21, SI14; AH-shi points, nausea and/or vomiting: PC6; heartburn or epigastric pain: ST34)	More than 3 years of experience 10 hours training
Liu(2015)[72]	MA	15~25 mm	n.r.	Manual stimulation (twirling lifting and thrusting)	30 min	0.3× 25/60 mm	Once/day	7 days/session, 2 session	PV6, LR12, CV12, ST35, LR3, LR2	n.r.
Pan(2015)[73]	MA	n.r.	n.r.	Manual stimulation (reinforcing-reducing)	30 min	n.r.	Once/day	6 days/session, 4 session	BL21, BL20, ST36, SP9, ST44, LR3, CV11, SP4, TaiYi(ST23)	n.r.
Ren(2015)[74]	MA	15~40 mm	Achieved	Manual stimulation (1 min at every 10 min)	30 min	0.30× 25/60 mm	Once/day	7 days/session, 2 session	PC6, LR14, CV12, ST25, ST36, LR3, LR2	n.r.
Wang(2015)[75]	Warm acupuncture	n.r.	Achieved	Warm needling stimulation	n.r.	n.r.	Once/day	2 weeks/session, 2 session	CV12, ST25, ST36, PC6, SP6, BL20, BL21	n.r.
Wang(2015)[76]	MA	25~30 mm	Achieved	Manual stimulation (twirling lifting and thrusting)	MA: 15~20 min; moxibustion: 5~10 min	0.25×40 mm	Once/1-2days	14 sessions, 4weeks	ST36, SP9, CV12, CV17, PC6, LE3, BL17, BL18, BL19	More than 6 years clinic experienc.

Table 3. Continued

Author (year)	Type of intervention	Insertion depth	Deqi achievement	Details of stimulation	Retention time	Needle type (diameter×length)	Treatment frequency	Duration	Acupuncture points	Practitioner background
Wang(2015)[77]	MA	n.r.	Achieved	Manual stimulation (twirling)	MA: n.r.Moxibustion: 3~5 cones	0.3×40 mm	Once/day	8 days/session, 4 session	CV8(moxibustion) ST25, CV10, ST23, ST27, LI4, LR3, PC6, SP6, LI10, ST36	n.r.
Wang(2015)[78]	MA	0.5~1.5 cun	n.r.	Manual stimulation (twirling lifting and thrusting)	30 min	n.r.	Once/day	5 days/session, 4 session	Main acupoints: ST36, PC6; Matching acupoints: LR3, ST44, SP4, SP9	n.r.
Xiong(2015)[79]	MA+warm acupuncture	n.r.	Achieved	Warm moxa stimulation	30 min	0.35×40 mm	Once/day	10 days/session, 1~3 session	CV12, ST25, CV10, CV4, ST36, PC6	n.r.
Xu(2015)[80]	MA	n.r.	n.r.	Manual stimulation (reinforcing-reducing)	30 min	n.r.	Once/day	5 days/session, 4 session	ST44, SP9, LR13, CV4, LR3, SP4, GB34, PC6, ST36, ST25, CV6, CV12, CV13, CV10, GV24, GV20, YinTang (Ex-HN-3)	n.r.
Yuan(2015)[81]	MA	25~50 mm	Achieved	Manual stimulation (reinforcing-reducing)	40 min	n.r.	Once/day	30 days	SP4, PC6	n.r.
Electro acupuncture										
Thitiphuree (1999)[82]	EA	n.r.	n.r.	n.r.	20 min	n.r.	3 times/week	2 weeks	ST36, P6, ST4, REN 10, REN 13	n.r.
Chen(2004)[83]	EA	n.r.	Achieved	Manual stimulation (twirling lifting and thrusting) electro stimulation	20 min	n.r.×1.5 cun	Once/day	7 days	ST36, PC6, CV12	n.r.
Yao(2006)[86]	EA	n.r.	Achieved	Electro stimulation (40 Hz, 10 mA)	n.r.	0.32×40~50 mm	One session	One time	ST36, PC6, ST25	n.r.
Yao(2006)[87]	EA	n.r.	Achieved	Electro stimulation (40 Hz, 10 mA)	30 min	0.32×40~50 mm	One session	NA	ST36, PC6, ST25	n.r.
Choi(2007)[89]	EA	n.r.	n.r.	n.r.	20 min	n.r.	n.r.	n.r.	PC6	n.r.
Wang(2007)[90]	EA+AA	NA	n.r.	Electro stimulation (low frequency)	30 min	NA	Once/day	5 days	Main acupoints: CV12, BL21, PC6, ST36 Matching acupoints: ST40, SP6	n.r.
Peng(2008)[92]	EA	n.r.	n.r.	Electro stimulation (40 Hz, 10 mA)	30 min	0.32×40~50 mm	Once/day	2 weeks	PC6, ST36	n.r.
Liu(2008)[95]	TENS	n.r.	n.r.	Electro stimulation (25 Hz, 2~10 mA)	30 min	n.r.	Twice/day	2 weeks/session, 2 session	A: P6, ST36 B: except two channel(ST36) C: no acupoint	n.r.
Zhou(2009)[94]	TEAS	n.r.	n.r.	Electro stimulation (100 Hz, 40 mA)	30 min	N.A.	Twice/day	10 days/session, 3 session	ST36, ST21, LR3, BL20, BL21, BL18	n.r.

Table 3. Continued

Author (year)	Type of intervention	Insertion depth	Deqi achievement	Details of stimulation	Retention time	Needle type (diameter×length)	Treatment frequency	Duration	Acupuncture points	Practitioner background
Yao(2009)[93]	EA	n.r.	n.r.	Electro stimulation (40 Hz, 10 mA)	15 min	n.r.	n.r.	n.r.	ST36, PC6	n.r.
Xie(2011)[97]	EA	n.r.	Achieved	Manual stimulation (reinforcing-reducing) electro stimulation (2 Hz/100 Hz)	30 min	n.r.	Once/day	10 days/session, 2 session	CV12, ST36, PC6, ST25, BL20, BL21	n.r.
Yang(2011)[98]	EA	n.r.	n.r.	Electro stimulation (40 Hz, 10 mA)	30 min	0.32×40~50 mm	Once/day	2 weeks	PC6, ST36	n.r.
Wang(2012)[102]	EA	4~32 mm	Achieved	Manual stimulation (twirling lifting and thrusting)Electro stimulation(2 Hz/100 Hz, 0.1~1.0 mA)	30 min	0.25×25/50 mm	Once/day	5 days/session, 4 session	ST42, ST40, ST36, ST34	n.r.
Sheng (2013)[103]	EA	n.r.	n.r.	Electro stimulation (25 Hz, 2~10 mA)	30 min	n.r.	Once/day	5 days/session, 4 session	ST36, PC6	n.r.
Li(2014)[107]	EA	n.r.	Achieved	Manual stimulation (reinforcing-reducing) Electro stimulation (2 Hz/100 Hz, 0.1~1 mA)	30 min	0.18×13 mm; 0.25×25/40/50 mm	Once/day	5 days/session, 4 session	(+) ST36, PC6+LR3, ST44(−) ST36, PC6+SP4, GB34	Same acupuntrist
Li(2014)[108]	EA	n.r.	Achieved	Manual stimulation (reinforcing-reducing)	30 min	0.25×25~50 mm; 0.18×15 mm	Once/day	5 days/session, 4 session	Main acupoints: ST36, PC6; Matching acupoints: LR3, ST44, SP4, SP9	n.r.
Ma(2014)[109]	EA	3~25 mm	Achieved	Manual stimulation (twirling lifting and thrusting)	30 min	0.30×25~50 mm	Once/day	6 days/session, 2 session	Main acupoints: CV12, ST25, ST36; Matching acupoints: CV17, LR13, BL20, BL21, LR14, LR3, SP9, ST44	n.r.
Ma(2014)[110]	EA	15~40 mm	Achieved	Manual stimulation (rotation)electro stimulation (2 Hz/100 Hz, 0.1~1 mA)	30 min	0.3×25/50 mm	Once/day	6 days/session, 2 session	CV12, ST25, ST36, CV17, LR13, LR12, BL21, BL20, LR3, SP9, ST44	n.r.
Yang(2014)[111]	EA	n.r.	Achieved	Electro stimulation (2 Hz/100 Hz, 5 mA)	30 min	0.3×25/50 mm	Once/day	5 days/session, 4 session	ST42, ST40, ST36, ST34	n.r.
Yeo(2014)[112]	EA	0.2~15 mm	Achieved	Manual stimulation (rotation 3~5 times)	15 min	0.3×40 mm	Once	Total once	CV15, CV13, CV12, CV10, LI4, LR3	With experience more than 2 years
Ji(2014)[113]	TENS	n.r.	n.r.	Electro stimulation (25 Hz, 2~6 mA)	2 hrs	n.r.	3 times/day	2 weeks	ST-36PC-6	n.r.

Table 3. Continued

Author (year)	Type of intervention	Insertion depth	Deqi achievement	Details of stimulation	Retention time	Needle type (diameter×length)	Treatment frequency	Duration	Acupuncture points	Practitioner background
Liu(2015)[119]	EA	15~40 mm	Achieved	Manual stimulation (rotation, twirling lifting and thru-sting) electro stimulation (2 hz/ 100 Hz, 0.1~1 mA)	30 min	0.25×25/50 mm	Once/day	9 days/session, 3 session	GV20, LI4, LR3, ST36, ST32, ST34, ST38, ST40, ST42, ST35, ST33	n.r.
Ma(2015)[120]	EA	n.r.	Achieved	Manual stimulation (rotation, twirling lifting and thru-sting) electro stimulation (2 hz/ 100 Hz, 0.1~1.5 mA)	30 min	0.18×13 mm	Once/day	5 days/session, 4 session	ST40, ST42, ST36, ST34	Professional acupuncturist
Yang(2015)[121]	EA	0.5~1.5 cun	Achieved	Manual stimulation (rotation, twirling lifting and thrusting)electro stimulation: 2 Hz/100 Hz; 0.1~1.0 mA	30 min	30 hao 1~2 cun	Once/day	6 days/session, 2 session	CV12, ST25, ST36, LR13, BL20, BL21, CV17, LR12, LR3, SP9, ST44	n.r.
Zhao(2015)[122]	EA	n.r.	Achieved	Electro stimulation	30 min	n.r.	Once/day	3 days/session, 2 session	LR3, ST36, ST25, SP9, BL21(based on Ziwu-liuzhu theory)	n.r.
Zhang(2015)[123]	EA	35~65 mm	Not achieved	Electro stimulation (2 Hz/200 Hz)	15 min	0.38×50/80 mm	Twice/day	4 weeks	ST36, CV12, PC6, LR3, SP4	n.r.
Ma,(2015)[124]	EA	2 mm	Achieved	Electronic stimu-lation(2/100 Hz, 0.5~1.5 mA)	n.r.	0.25×25~40 mm; 0.18×13 mm	Once/day	5 days/session, 4 session	Acupuncture(4group) A: ST42, ST40, ST36, ST34 B: ST38, ST35, ST33, GB32 C: BL21, CV12 D: GB40, GB37, GB36, GB34 E: sham group(non-acu-point: ST36 lateral)	At least 2 years of clinical experience
Acupuncture embedding therapy, Acupoint injection										
Liao(2004)[85]	Acupoint-injection	20 mm	Achieved	Inject 1~2 ml	N.A.	N.A.	Once/day	5 days/session, 4 session	BL18, BL21, ST36.	n.r.
Liu(2010)[95]	Acupoints embedding therapy	0.8~1.2 cun	Achieved	n.r.	N.A.	No.9 lumbar puncture needle	Once/week	3 months	Main acupoints: CV12, ST25, ST36 Matching acupoints: BL18, BL20, BL22, SP6, BL17	n.r.
Lu(2011)[96]	Acupoints embedding therapy	1.0~1.2 cun	Achieved	Manual stimulation(lifting, thrusting)	N.A.	No.9 injection needle. No. 00 catgut, 1~1.5 cm	Once/week	8 weeks	Main acupoints: ST36, BL21 Mathcing acupoints: BL20, BL18	n.r

Table 3. Continued

Author (year)	Type of intervention	Insertion depth	Deqi achievement	Details of stimulation	Retention time	Needle type (diameter×length)	Treatment frequency	Duration	Acupuncture points	Practitioner background
Zeng(2013)[105]	Acupoints embedding therapy	12~18 mm	Achieved	n.r.	n.r.	Catcut, n.r.	Once/week	4 weeks	BL20, BL21, BL19, BL18	n.r.
Xu(2013)[106]	Acupoint-injection+ Moxibustion	0.5~1.5 cun	Achieved	Inject 2 ml	NA	NA	Once/day	5 days/session, 4 session	CV12, ST25, ST36, BL20, BL21, CV4, CV6	n.r.
Zhang(2014)[117]	Acupoints embedding therapy	0.8~1.5 cun	Achieved	n.r	12 h	Catcut, 0.32×n.r	Once/10 days	3 times	CV12, BL20, BL18, ST36	n.r.
Zhou(2014)[118]	Acupoint-injection	1~1.5 cun	Achieved	Inject 0.5~1 ml	NA	NA	Once/2 days	3 times/session. 2 session	CV12, PC6, ST36	n.r.
Yan(2015)[127]	Acupoints embedding therapy	25 mm	n.r.	n.r.	n.r.	No.0~3 catcut	Once/2 weeks	4 session	LI11, CV12, ST25, ST36, BL23, BL21, BL20	n.r.
Pan(2015)[128]	Acupoint-injection	n.r	n.r.	Inject 2 ml	NA	NA	Once/2 days	2 weeks/session, 2 session	CV12, ST36	n.r.

AA : auricular acupuncture, EA : electroacupuncture, MA : manual acupuncture.

Table 4. Intervention Characteristics of Articles of Moxibustion Therapy for Functional Dyspepsia

Author(year)	Moxibustion type	Retention time	Frequency	Duration	Acupuncture points	Practitioner background
Shi(2004)[84]	Indirect moxibustion	5~6 cones	1~2 times/day	15 days/session, 2 session	CV12, CV13, CV11, PC6, SP4, BL20, BL21, ST36, ST20, ST21, ST25, CV9, SP9, LR3,LR2.	n.r.
Huang(2006)[88]	Moxibustion plaster therapy	1 day	1 session	1 session	CV12, CV8	n.r.
Liu(2011)[99]	Indirect moxibustion	30 min	Once/day	5 days/session, 2 session	CV12, ST36	n.r.
Yang(2011)[100]	Indirect moxibustion	8~60 min	Once/2 days	1 week/session, 4 session	BL18, BL21, CV13, CV10	n.r.
Hu(2011)[101]	Indirect moxibustion	n.r.	Once/day	8 days/session, 3 session	ST25, CV12, CV4, BL18, BL17, ST37	n.r.
Wang(2013)[104]	Direct moxibustion	5~10 cones	Once/day	10 days/session, 3 session	CV8, ST25, CV12, ST21, CV4, ST28, PC6, SP4, LI4, LR3, LI10, ST36	n.r.
Liu(2014)[114]	Indirect moxibustion	40 min	Once/day	2 weeks/session, 2 session	BL20, BL21, CV12, CV13, ST25	n.r.
Dan(2014)[115]	Indirect moxibustion	20~30 min	Once/day	10 days/session, 4 weeks	RN8	n.r.
Fu(2014)[116]	Indirect moxibustion	7 cones, 25 min	Once/day	5 days/session, 4 weeks	CV12	n.r.
Yi(2015)[125]	Indirect moxibustion	3~5 cones	Once/day	10 days/session, 3 session	CV8	n.r.
Li(2015)[126]	Indirect moxibustion	20~30 min	Once/day	4 weeks	CV12, CV8, ST25, ST36, BL18, BL20, BL17, SP6	n.r.

다. 침요법을 사용한 106편의 연구 중 62편(58.5%)에서는 득기를 유발하였고, 3편(2.8%)에서는 유발하지 않았으며, 나머지 41편(38.7%)은 득기 유발 여부에 대해 보고하지 않았다. 전침과 매선요법, Acupuncture Injection을 제외한 수기침 68편 중에 Warm Acupuncture를 사용한 2편, 자극을 하지 않았다고 보고한 1편, 자극방법을 보고하지 않은 17편을 제외한 48편에서 수기자극을 자극방법으로 사용하였고 Reinforcing-reduction Method나 Twirling Lifting and Thrusting Needle 등의 자극방법이 가장 많았다(Table 3). 106편의 연구 14편의 연구를 제외한 92편의 연구가 유침시간을 보고하였는데, 15~30분의 유침시간을 보고한 연구가 84편(79.2%)으로 가장 많았다. 침치료의 빈도로는 '일 1~2회'를 보고한 연구가 74편(70.0%)으로 가장 많았고, 다음으로는 '주 2~3회'를 보고한 연구가 16편(15.1%), 그리고 '1~2주당 1회'를 보고한 연구 5편(4.7%) 순이었다. 치료기간을 보고한 103편 중 '30일 미만'이 90편(87.4%)으로 가장 많았고, '30일 이상'이 13편(12.6%)이었다. 기능성 소화불량에 대한 침 연구에서는 ST36, CV12, PC6 등의 혈자리가 많이 사용되었다. 106편 중 92편(86.8%)에서는 시술자의 경력에 대해 보고하지 않았다. 시술자의 요건을 기술한 논문들에서는 시술자 면허와 더불어 2~3년의 임상경력을 내세우는 연구들이 가장 많았고 106편 중 92편(86.8%)에서는 시술자의 경력에 대해 보고하지 않았다. 기능성 소화불량에 대한 침 연구에서는 ST36, CV12, PC6 등의 혈자리가 많이 사용되었으며, 같은 경락의 혈자리끼리 같이 사용되는 경우가 많았다.

2) 기능성 소화불량에 대한 뜸요법: 뜸요법을 사용한 11편의 연구 중 직접구를 사용한 연구는 1편(9.1%), 간접구를 사용한 연구는 9편(81.8%), 그리고 나머지 1편(9.1%)에서는 뜸 Plaster Therapy를 사용하였다(Table 4). 시술이 1회만 이루어진 연구를 제외한 10편의 연구 중 9편(81.8%)의 연구에서는 '일 1-2회' 뜸을 시술하였다(Table 4). 기능성 소화불량에 대한 뜸 연구에서는 CV12, ST36, ST25 등의 혈자리가 많이 사용되었으며 LI4, LR3, PC6, SP4, SP9 등의 혈위가 다른 혈위가 같이 사용되는 빈도가 많았다.

고 찰

이 연구에서는 기능성 소화불량증에 대한 한의학 비약물 치료의 효능평가에 대한 향후 임상연구의설계 및 수행 과정에 활용할 수 있는 기초자료를 얻고자 관련 선행연구에 대한 체계적 문헌 고찰을 수행하였다. 선행연구의 경향을 분석한 결과, 향후 임상연구 설계에 있어서 연구 대상자, 중재법, 대조군, 결과지표 선정 단계별 다음과 같은 점을 고려하야 할 것으로 사료된다.

기능성소화불량의 침구치료의 효과를 평가한 선행 연구에서 사용된 진단기준을 살펴보면 버전의 차이는 있지만 피험자 선정에 있어서는 ROME의 기준을 일관되게 따르고 있었다[9]. 기능성 소화불량증의 정의 및 치료지침은 18개국 연구자들의 기능성 위장관 질환에 대한 델파이 합의과정인 ROME Process에 따라 정해지는 진단기준을 바탕으로 각 단체나 국가에 맞게 수정되어 발표되며 현재 최신 기준은 ROME 버전 III이다. 다만 한국과 중국에서 수행된 일부의 연구에서 기능성 소화불량증에 대한 연구로 보고하고 있지만 ROME의 기준을 따랐음을 명시하지 않는 경우가 있었다. 비록 선정제외기준을 설명한 항목이 ROME의 기준 상 기능성 소화불량증에 해당하지만, 보고에 있어서 ROME의 기준을 따랐음을 명시하지 않으면, 동일한 환자군을 대상으로 수행한 연구인지 판단이 모호해질 가능성이 있다. 향후 연구 보고에 있어서 ROME 기준을 따랐는지 명시하는 것이 필요할 것으로 보인다.

또한 변증을 진단 기준에 추가로 활용하고 있는 연구가 있었는데 비위기허증(脾胃氣虛證)으로 진단 후 침치료를 하거나[10,11] 비위기허증(脾胃氣虛證)과 간실위화증(肝實胃火證)별 다른 혈위에 대한 침치료 연구였다[11]. 정[6]의 연구에 의하면, 기능성 소화불량증을 대상으로 한 한의학 연구에서 간위불화(肝胃不和), 간울기체(肝鬱氣滯), 간울비허(肝鬱脾虛), 음식정체(飮食停滯), 비위습열(脾胃濕熱), 비허습담(脾胃濕痰), 한열착잡(寒熱錯雜), 비위허약(脾胃虛弱)의 변증이 사용되었고, 기존에 비약물 치료의 효능평가 연구에서 고려된 비위기허증, 간실위화증보다 다양한 것으로 나타났다. 기능성 소화불량증의 한의학 비약물 치료 연구의 대상자 설정에 있어 보다 다양한 변증을 고려하여 환자군 설정과, 소그룹 분석(Subgroup Analysis)을 수행하는 것이 필요할 것으로 보인다.

기능성 소화불량증에 사용된 침구치료 중재법으로 침, 수지침, 이침, 침과 부항의 병행, 전침, 뜸, 매선, 약침, 경피 신경 전기자극 치료법 등과 같이 다양한 치료법이 사용되었다.

자입깊이와 관련하여 침과 전침 대부분 보고를 하고 있지 않거나 여러 혈위가 사용되었음에도 불구하고 깊이를 15~25 mm와 같이 전체 혈위에 대한 범위를 사용하여 보고하였고 단위도 mm와 촌(寸)으로 일치하지 않았다. 이에 선행연구를 분석하여 침의 자입깊이를 선정에 활용할 수 있는 결과를 얻기는 어려웠다. 침의 자입깊이에 따라 안전성, 효과성이 달라질 수 있다는 연구가 있어 향후 연구를 수행한 이후에 혈위별 자입 깊이를 보고해야 할 필요성이 있어 보인다[12].

득기는 침치료 후 자극을 유발하여 얻는 특유의 감각으로 질환과 상관없이 자극방법과 득기여부는 효과 평가에 있어서 중요하게

고려해야 할 대상이다. 그러나 자극방법은 언급하나 득기여부는 보고하지 않는 등, 자극방법과 득기여부 두 가지를 모두 보고한 연구가 많지 않았다. STRICTA에서는 득기여부에 대한 기록만을 권장하고 SASS, MASS 등 다양한 보고방법[13]이 있지만 아직 표준화된 방법은 없기 때문일 가능성이 있다. 자극방법과 득기여부를 보고한 경우, 자극방법에는 Thrusting In-lifting Up(提插), Twirling 돌리기(捻轉), Manipulating(刺戟), Reinforcing-Reducing(補瀉), 전기자극, 온열자극을 단독 또는 병행하는 방법이 있었는데, 자극방법을 자세히 보면 염전은 90°～180°가 가장 많이 사용되었고 자극빈도는 분당 60회부터 90, 120회까지 다양하였으며 느리게 자극하는 경우는 2분～10분에 한번 자극하였다. 전기자극은 주파수(Hz)와 전류량(mA)로 빈도와 자극량을 표현할 수 있는데 2, 40, 100 Hz, 0.1～1.0, 1.5 또는 5～10 mA의 전기자극을 주로 보고하고 있었다. 온열자극은 자극을 준 유무만이 보고 되었다. 자극방법은 환자의 허실상태에 따른 보사의 방법에 차이를 두지만, 대부분의 연구에서 환자의 상태를 허실로 구분하고 있지 않았다. 향후 침구치료 연구를 수행함에 있어 자극방법을 선정함에 있어 환자의 변증여부를 함께 고려하여 선정하여야 할 것으로 보인다[6].

유침시간은 15분, 20분, 30분의 종류가 있는데, 30분을 연구에서 가장 많이 활용하고 있었다. 유침시간은 환자와 질환의 상태에 따라 달라질 수 있으나, 침구이론에서 기의 흐름이 인체에 한번 이루어지는 시간을 대략 30분으로 잡고 있어[14], 기능성 소화불량증에서도 30분을 많은 연구자들이 적절한 시간으로 판단한 것으로 보인다.

침 종류는 직경, 길이로 표현할 수 있는데 직경과 길이를 모두 보고하지 않는 경우가 있어 이 또한향후 연구 결과 보고에 주의가 요구된다. 자침 빈도는 하루에 1번이 가장 많았고 기간은 최단 2일에서 최장 30일이었다. 대한소화기기능성질환 운동학회에서 기능성 소화불량증을 치료함에 있어 2주단위로 8주까지 치료하고 있어 향후 연구기간을 설정함에 있어 참고할 만하다.

침과 전침치료에 주로 사용되는 혈위는 혈위 단독으로 보았을 때는 ST36(족삼리), CV12(중완), ST25(천추), LR3(태충), PC6(내관), BL20(비수), BL21(위수), ST44(내정) 혈이 많이 사용되었다. 족삼리는 위의 합혈로 調理腸胃, 調中氣, 降逆氣, 疏風化濕, 小腸消滯, 通調氣血, 扶正祛邪하고 중완은 위경의 모혈 和胃氣, 化濕滯, 理中焦하며 천추는 대장의 모혈 調腸胃, 理氣血, 扶土化濕, 花管調經, 理氣消滯 한다. 위 3혈은 뜸, 침 모두에서 다빈도로 사용되었다. 치료 방법별로 뜸치료에 있어서 주로 사용된 혈위는 CV12(중완), ST36(족삼리), ST25(천추) 혈이 많이 사용되었고 침치료에 있어서 중완, 족삼리, 천추 혈 외 다빈도로 사용된 혈위로 내관, 태충, 전중, 비수, 위수, 내정, 양구, 충양, 풍륭, 장문혈이 있었다. 뜸과 침의 혈위선정에 주로 사용되는 혈위가 유사하고 침에서 사용되는 혈위 조합이 다양한 점으로 보아 비위기능과 관련된 기본적인 혈위조합을 바탕으로 뜸은 시술하기 용이한 혈위를 선정하는 것으로 보인다. 혈성에 있어서 내관은 심포경의 낙혈로 益心安神, 和胃降逆, 鎭靜止痛하고, 태충은 간경의 원혈로 理下焦濕熱, 通經活絡, 淸熄肝火肝陽하며, 전중혈은 심포경의 모혈로 理氣, 散瘀通乳, 止嘔定喘, 祛寒止痛하여 기능성 소화불량증에 대한 치료에 있어 정서적인 요인도 함께 고려하는 것으로 보인다. 비수혈은 배수혈 중 비장에 해당하고 和胃化濕, 健脾調運化, 化營血하며 위수혈은 위장에 해당하는 배수혈로 和胃理氣, 消食化濕, 補中氣虛弱하며 내정은 위경의 수혈로 通降胃氣, 理氣鎭痛하고, 양구는 위경의 극혈로 通調胃氣, 調胃和中, 祛風化濕하고 충양은 위경의 원혈로 扶土化濕, 和胃寧神하며 풍륭은 위경의 낙혈로 健脾化痰, 淸神志하고 장문혈은 비경의 모혈로 健脾調運化, 散五臟寒氣, 消痰, 和中焦積滯하여 비위경락의 혈위를 추가로 사용하여 비위기능 조절을 도울 수 있게 혈위를 구성한 것으로 보인다.

대조군 설정에 있어서 선행연구들의 경향을 보면, 약물요법(Medication)이 59편으로 가장 많았고 Sham Acupuncture 15편으로 설정되었으며 기타 무처치(No treatment), TEA, sham TEA 등이 사용되었다. Domperidone은 위장관 운동을 촉진시키는 작용을 하는 약물로, 대조군의 약물요법으로 가장 많이 사용되었다. 기능성 소화불량증에 대한 약물치료로는 프로톤펌프억제제, 제산제, 위장관 운동촉진제가 사용되는데 한의학 연구의 대조군으로 위장관 운동 촉진제인 Domperidone이 주로 사용된 것은 한의학 비약물 치료를 통하여 위장관 운동 촉진작용을 기대한 것으로 판단된다. Domperidone은 메타분석에서 2～4주간 사용했을 때 위약에 비해 증상을 보였기에 이를 대조군으로 활용하는 연구 설계에 참고할 만하다[15].

효과의 평가 변수와 관련하여서는 기능성 소화불량증에 대하여 유의한 결과를 보인 평가 변수 위주로 빈도 분석을 하여 보았다. 대부분의 연구가 임상적 유효성이 유의한 결과를 보였으며 그 외 증상점수(Symptoms), NDI, 삶의 질 등의 평가변수를 볼 수 있었다. 유의한 결과를 많이 보이지는 않았지만 위장관운동성을 측정하기 위하여 혈중 Motilin의 농도나 Electrogastrogram(EGG)을 사용하였다.

본 연구는 기능성 소화불량에 대한 침구요법의 효능을 평가한 한의학 임상연구를 분석하여 기존 연구의 디자인과 연구에 사용한 치료방법 및 평가변수의 경향을 살펴보았다. 전반적으로 연구 보고 가이드라인에서 제시하는 항목에 대하여 충분하게 보고하지 못한 경우들이 많아, 최근 중재법의 효과를 평가하기 위한 선행연구들을

분석하는 체계적 문헌고찰 및 메타분석이 많이 사용되고 있음을 고려할 때, 향후 연구를 수행함에 있어 디자인을 엄격하게 할뿐만 아니라 보고에 있어서도 엄격한 기준을 적용해야 할 필요가 있는 것으로 사료된다.

결 론

본 연구는 기능성 소화불량증의 침구치료의 연구방법에 대한 체계적 문헌고찰을 수행하였다. 국내외 학술문헌 데이터베이스를 검색하고 선별하여 얻어진 117편의 연구를 분석한 결과, 일반 침을 이용한 연구가 가장 많았으며 전침, 뜸, 약침, 매선요법 등의 순으로 연구되었다. 본 연구의 대상논문에서는 ROME Diagnosis를 사용한 경우(65%)가 많았으나 중국형 진단기준을 사용한 연구도 2000년도부터 꾸준히 수행되었다. 각 연구들은 주로 약물요법을 대체할 수 있는지에 대한 효능을 증명하고자 하였으며 치료효과를 평가하기 위한 변수로 주로 임상적 유효성(53%)을 사용하였고 대체로 각각의 연구별로 그 목적에 따른 다양하고 특정한 결과변수들을 사용하는 것으로 나타났다. 또한 침구치료 수행방법은 자침 깊이, 득기반응, 자극형태, 유침시간 등에 있어서 다양하게 설계되어 특정한 치료양상을 찾기 어려웠으나 경혈 선정에 있어서 ST36(족삼리), CV12(중완), ST25(천추)가 가장 많이 사용되는 것으로 나타났다.

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