



Review Article

## Recent Research Trends in Moxibustion Treatment in Korea

Ju-Hyeon Lee\*, Doo-ree Hwang, Seung-Hyo Hong

Department of Acupuncture and Moxibustion Medicine, Dongseo Oriental Hospital, Seoul, Korea



### ABSTRACT

#### Article history:

Submitted: October 1, 2019  
Revised: November 12, 2019  
Accepted: November 22, 2019

#### Keywords:

Indirect Moxibustion,  
Direct Moxibustion, Moxa,  
STRICTOM

A total of 1,235 studies were retrieved on June 23, 2019, from 3 databases. Selected 59 studies were evaluated by year of publication, study type, subject condition/disease, acupoint, standards for reporting interventions in clinical trials of moxibustion (STRICTOM), Cochrane risk of bias (RoB), and risk of bias assessment tool for non-randomized study (RoBANS). Most studies were conducted in 2011, after which the number of studies decreased. The most common study type was 25 case reports (CR), 16 uncontrolled clinical trials (UCT), 11 randomized controlled trials (RCT), and 7 controlled clinical trials (CCT). Moxibustion treatment was mainly used for musculoskeletal and circulatory diseases/conditions. A total of 83 acupoints were used, A-shi points being the most used. As for STRICTOM, an average of 7.4 items were satisfactory for UCT and CR without a control group, and an average of 9.4 items were satisfactory for RCT and CCT. RCT was assessed using the RoB, and many items were rated as uncertain. In this study, the need for RCT of moxibustion treatment in Korea was identified. The detailed description of study methods and results will provide evidence for the efficacy of moxibustion treatment in preventive and therapeutic aspects of Korean traditional medicine.

<https://doi.org/10.13045/jar.2019.00227>  
pISSN 2586-288X eISSN 2586-2898

©2020 Korean Acupuncture & Moxibustion Medicine Society. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

### Introduction

Moxibustion therapy is a Korean traditional medicine treatment which involves burning *Artemisiae Argi* Folium in onto the acupoint to apply both the drug and a warming action at the same time [1]. Moxibustion is an important treatment in Korean traditional medicine and to quote <<Hwangjenaegyong-Youngch u·Guanneung>> [2], “first acupuncture, second moxibustion, third herbal medicine”. It is important to note that, “it is appropriate to use moxibustion without acupuncture.” The indications for treatment are wide, and if acupuncture is ineffective at treating serious illness, it is replaced with moxibustion treatment. When looking at the ranking of the treatment fee under the 5 categories of medical care expenses ratio in Korean traditional medicine from 2004 to 2013, moxibustion was shown to be high ranking and placed after acupuncture and cupping. In addition, comparing the growth rate during the period, moxibustion increased by 398% compared to the 89% increase in acupuncture [3]. Public interest in moxibustion treatment and the utilization of Korean medicine doctors has increased, due to an aging society, and increasing social and medical interest in chronic diseases. Clinical

trials for moxibustion have also increased dramatically since 2000 [4]. However, relatively few studies have been conducted on moxibustion treatment in Korea compared to herbal medicine and acupuncture. Several studies have systematically reviewed a single condition/disease, but few studies have conducted a comprehensive and systematic examination of clinical studies performed in Korea. This study aimed to elucidate clinical research trends in moxibustion treatment in Korea in the last 20 years, to evaluate its use in clinical treatment.

### Materials and Methods

#### Database and search method

The analysis examined clinical research studies published over the last 20 years from 1999 to December 2018. The National Digital Science Library (NDSL), Research Information Sharing Service (RISS), Oriental Medicine Advanced Searching Integrated System (OASIS) were searched. In the NDSL database “Moxibustion (in Korean)” OR “Moxibustion Treatment (in Korean)” OR “indirect moxibustion (in Korean)” OR “direct moxibustion (in Korean)”

\*Corresponding author. Ju-Hyeon Lee  
Department of Acupuncture and Moxibustion Medicine, Dongseo Oriental Hospital, Seoul, Korea  
E-mail: ma-film@hanmail.net  
ORCID: Ju-Hyeon Lee <https://orcid.org/0000-0002-1430-0106>

OR “moxa” OR “moxibustion” OR “Moxa (in Chinese character)” search terms were used. In the RISS database “Moxibustion (in Korean)” OR “Moxibustion Treatment (in Korean)” OR “Moxa (in Chinese character)” search terms were used. In the OASIS database, the search terms “Moxibustion Treatment (in Korean)” OR “indirect moxibustion (in Korean)” OR “direct moxibustion (in Korean)” OR “moxa” OR “moxibustion” were used. Research published in dissertations and journals were also included.

### Selection and exclusion methods

Clinical articles published in Korea were selected and clinical listings without patients were excluded. Literature reviews, animal experiments, and moxibustion-related device studies were excluded in this review. Studies in which the Korean Medicine doctor did not directly perform moxibustion treatment were excluded from the study. In the moxibustion-related treatments of warming acupuncture, burning acupuncture, BUDDEUMI (Hanji, Busan, Korea) such as moxibustion, and other Korean traditional medicine treatments, a variety of devices were used, except if the effect of moxibustion treatment was not clearly known. Studies that confirm the effectiveness of moxibustion treatment were included in the study along with moxibustion therapy, and other treatment methods.

### Select materials

The entire process of collection and screening of the data was carried out independently under the selection and exclusion criteria. Any discrepancies were reviewed by 2 independent researchers to find consensus, and input from third-party researchers was sought when agreement could not be reached.

### Data extraction

In clinical studies, yearly changes, number of subjects, analysis of the study type, and the subject conditions/diseases and symptoms were analyzed using ICD-10. In addition, based on Standards for reporting interventions in clinical trials of moxibustion (STRICTOM), the contents of the moxibustion types, treatment frequency and duration, the number of repetitions used on each occasion, and used acupoints were analyzed.

### Assessing the quality of research

Risk of bias in randomized controlled trials (RCT) was assessed using the Cochrane risk of bias (RoB) tool [5]. In controlled clinical trials (CCT) the risk of bias assessment tool for non-randomized study (RoBANS) [6] was used. All items were evaluated when specified in the text of the selected study. In cases of disagreement between the evaluators, the opinions of third-party researchers were sought.

## Results

### Search results

According to the parameters set in this study, searches were conducted in 3 Korean databases and 1,263 studies were retrieved from 1999 to December 2018. There were 855 studies initially selected, excluding 408 duplicate studies. There were 195 studies which were selected with the exception of 52 studies that did not perform moxibustion, 60 studies were not patient based, and 548 studies were not performed in clinics. Studies in which the full

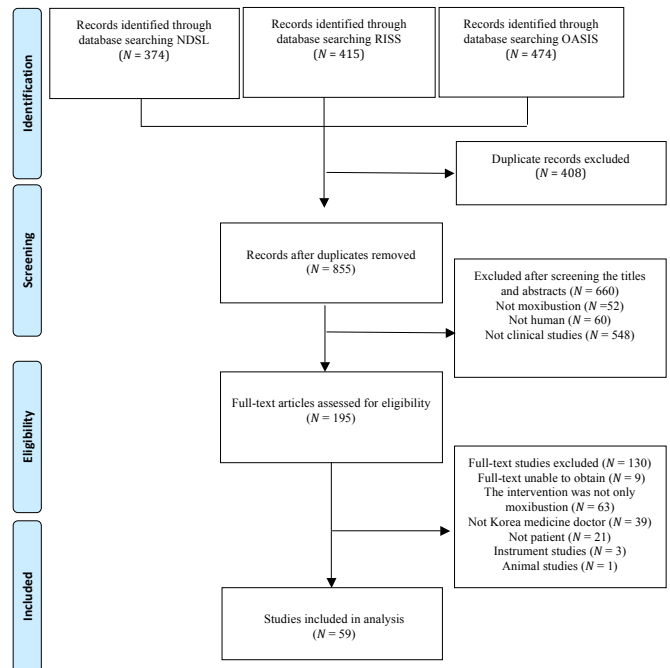


Fig. 1. Flow diagram according to the diagram of PRISMA. PRISMA, preferred reporting items for systematic reviews and meta-analyses.

text was not available, the results of moxibustion treatment could not be clearly confirmed in combination with other treatments, treatments not directly administered by a Korean medicine doctor, non-patient studies, device studies, animal trials, and other factors were excluded. There were 59 studies finally selected for review (Fig. 1; Table 1).

### Analysis

#### Classification by year

Looking at studies published between 1999 and 2018 there were, no publications in 1999, 2 in 2000 [7,8], 3 in 2001 [9-11], 0 in 2002, 5 in 2003 [12-16], 7 in 2004 [17-23], 5 in 2005 [24-28], 3 in 2006 [29-31], 4 in 2007 [32-35], 5 in 2008 [36-40], 6 in 2009 [41-46], 3 in 2010 [47-49], 9 in 2011 [50-58], 2 in 2012 [59,60], 1 in 2013 [61], 0 in 2014, 2 in 2015 [62,63], 0 in 2016, 1 in 2017 [64], and 1 in 2018 [65] (Fig. 2).

#### Classification by clinical study type

Case reports (CR) were the most common type of study with 25 cases (42%) published. There were 16 cases (27%) of uncontrolled clinical trials (UCT), 11 cases of RCT (19%), and CCT had the least number of cases (12%; Fig. 3).

#### The number of study subjects

There were 41 studies where less than 30 people (69.5%) were included in the study, 11 studies of 30-60 people (18.6%), 5 studies of less than 90 people (8.5%), and 2 studies of 90 or more (3.4%). In the UCT studies, the number of patients was 6-42, with an average of 23.8. In RCT studies, the number of patients was 20-85, with an average of 42.09. In the CCT study, the number of subjects was at least 24 to a maximum of 122, with an average of 60.

#### Classification by subject condition/disease

Conditions/diseases were classified under the International Classification of Diseases (ICD-10). Conditions/diseases of

Table 1. Analysis of Moxibustion Treatment Studies.

Author (y)	Study design	Disease	Subjects	Moxa type	Period	Frequency	Repeat time	Moxibustion points	Result	Other treatment
Kang (2000)	RCT	Dysuria after stroke	A:10 B:10	IM	4wks	1 time/d	5	CV6, CV4, CV3	S	O
Kwon (2000)	CCT	Peripheral facial paralysis	A:14 B:10	IM	Unclear	1-2 times/d	1	ST4, GB14	S	O
Park (2001)	CR	Chronic hiccup after stroke	1	DM	11d	1 time/d	3	CV17, BL15, BL17	I	X
Kang (2001)	RCT	Constipation	A:11 B:30	IM	Unclear	1 time/d	3	ST25	S	X
Lee (2001)	UCT	Hypertension	25	IM	5wks	2 times/wk	3	LI11, CV4	S	O
Choi (2003)	RCT	Hemiplegic upper extremity after stroke	A:20 B:20	DM	2wks	1 time/d	5	LI4, LI11, TE3, TE5	S	O
Kim (2003)	UCT	Low back pain	14	IM	4wks	3 times/wk	1	L3-4	I	X
Woo (2003)	CR	Oculomotor nerve palsy	1	IM	2wks	1 time/d	1	GB16	I	X
Lim (2003)	UCT	Stress urinary incontinence	13	IM	2wks	1 time/d	2	CV4, CV3	I	X
Yun (2003)	RCT	Dysuria after stroke	A:23 B:20	DM	10d	6 times/wk	5	CV6, CV4, CV3	S	O
Kim (2004)	CR	Persistent pain of left dorsal hand and wrist after stroke	1	DM	7d	1 time/d	30	BL11	I	O
Lee (2004)	UCT	The complication of diabetes	23	IM	4wks	3 times/wk	1	BL17, 膝俞, BL20, BL21, CV12, ST36	I	X
Choi (2004)	CR	Insomnia	1	DM	4wks	1 time/d	3	KI1	I	O
We (2004)	UCT	Low back pain	30	DM	10d	1 time/5d	7	A-shi point	I	O
Kim (2004)	CCT	Stress urinary incontinence	A:30 B:30	IM	1wks	1 time/d	3	CV6, CV3	S	X
Park (2004)	CR	Breech presentation	1	DM	4wks	1 time/d	3	BL67	I	O
Chang (2004)	CCT	Paralysis after stroke	A:35 B:33	DM	4wks	6 times/wk	3	LI11, TE5, ST36, GB39, 1 of hand&foot meridians 6 well points	S	O
Park (2005)	UCT	Idiopathic Parkinson's disease	15	IM	8wks	6 times/wk	5	GV20, CV12, ST36, BL18, BL20	I	O
Kim (2005)	UCT	Dysphagia after stroke	42	DM	1d	1 time/d	5	CV17	I	X
Kim (2005)	RCT	Hypertension	A:30 B:31	DM	1d	1 time	5	ST36	S	X
Cho (2005)	CR	Sprain	3	DM	3,10,14d	1 time/d	3	A-shi point	I	X
Choi (2005)	CR	Knee joint pain after stroke	1	DM	2wks	1 time/d	9	ST34, EX-LE5	I	X
Hwang (2006)	UCT	Failed back surgery syndrome (FBSS)	51	DM	More than 8wks	1 time/5d	9	A-shi point	I	X
Kim (2006)	CCT	Frozen shoulder	A:10 B:10	IM	More than 4wks	3 times/wk	3	LI15 LI16 TE14 TE15 SI9 SI10	S	X
Yoon (2006)	UCT	Diabetics	23	IM	4wks	Unclear	1	BL17, 膝俞, BL20 BL21, CV12, ST36	I	O

RCT, randomized controlled trials; CCT, controlled clinical trials; CR, case reports; UCT, uncontrolled clinical trials; IM, indirect moxibustion; DM, direct moxibustion; S, significance; I, improvement; A, intervention group; B, control group.

Table 1. (Continued).

Author (y)	Study design	Disease	Subjects	Moxa type	Period	Frequency	Repeat time	Moxibustion points	Result	Other treatment
Kang (2007)	CR	Sciatica	3	DM	8-10d	1 time/2d	5	A-shi point	I	O
Choi (2007)	CR	Jue zheng caused by Wang Yang	1	IM	8wks	Unclear	3	CV8	I	O
Park (2007)	CR	Lumbar Herniation of intervertebral disc	1	DM	9wks	1 time/d	3	L3-4, L4-5, L5-S1, BL24, BL25, BL28	I	O
Hur (2007)	UCT	Shoulder pain	11	IM	Unclear	Unclear	1	LI16	I	X
Cho (2008)	UCT	Dysphagia after stroke	34	DM	1	1 time/d	5	CV17	I	X
Lee (2008)	CR	Coldness and pain of both lower extremity from the conus medullaris syndrome	1	DM	2wks	6 times/wk	7	ST32 ST33 ST36 GB39	I	O
Lee (2008)	RCT	Functional recovery on stroke	A:21 B:21	IM	6wks	5 times/wk	3	LI4 LI11 TE5 LR3 GB39 ST36	S	O
Choi (2008)	CCT	Peripheral facial paralysis	A:19 B:22	IM	2wks more than	Unclear	3	GB14 ST2 ST6 ST4 TE23 LI19/ LI4 ST36 CV12 CV4 LR3	S	O
Chiang (2008)	UCT	Primary dysmenorrhea	27	IM	3wks	2 times/wk	3	SP6	S	X
Doh (2009)	RCT	Degenerative knee arthritis	A:10 B:10	IM	4wks	3 times/wk	3	EX-LE5 ST35 SP10 ST32 LR8 GB34 SP9	S	O
Lee (2009)	CR	Myelopathy hand caused by cervical myelopathy	1	DM	9d	2 times/d	7	EX-B2 TE6 LI4 TE3 SI3 SI2	I	O
Park (2009)	CR	Chronic low back pain	1	DM	2wks	3 times/wk	3	BL23 BL24 BL25	I	X
Kim (2009)	CR	Cancer pain	1	IM	27d	1 time/d	1	BL13 BL17 BL42 BL43	I	O
Jo (2009)	CR	Prostatitis, benign prostatic hypertrophy	2	IM	1d	1 time/d	1	CV1 BL28 CV3	I	X
Cheon (2009)	CR	Low back pain	2	DM	58d/30d	1 time/d	10/7	GB34, GB36, GB37, GB38, GB39, BL21, BL22, BL23, BL24, BL25, BL26, BL43, BL14, GV3, BL25 A-shi point	I	O
Kim (2010)	CR	Nocturnal Enuresis	5	IM	2,4,6,10,12wks,	Unclear	2	CV4	I	O
Kim (2010)	CR	Low back pain of spinal stenosis	1	DM	7d	1 time/d	5	GV3, BL24, BL25 BL26, BL27	I	O
Yoon (2010)	UCT	Peripheral Blood Flow with Hemiplegia	13	DM	1d	1 time/d	5	LI4, TE3, TE5, LI11	S	X
Kim (2011)	RCT	Low back pain of HIVD	A:15 B:17	IM	9d	1 time/d	3	GV4, GV3, BL23 BL24, BL25, BL26, BL36, GB30, GB34 GB39, A-shi point	S	O
Lee (2011)	CR	Failed back surgery syndrome (FBSS)	5	DM	10-15wks	1 time/wk	1	A-shi point	I	X
Lee (2011)	CCT	Low back pain of HIVD	A:49 B:46	DM	12d	1 time/2d	3	Popliteal crease	I	O
Cho (2011)	CR	Type 1 CRPS	1	IM	4wks	5 times/wk	3	ST34 GB34 GB31 BL40	I	X
Choi (2011)	CR	Intersection syndrome	1	DM	16d	5 times/16d	1	A-shi point	I	X
Kim (2011)	RCT	Neck pain caused by Whiplash Injury	A:42 B:43	IM	5d	1 time/d	3	BL10, GB20, SI9, SI14, SI15, SI13	S	O

RCT, randomized controlled trials; CCT, controlled clinical trials; CR, case reports; UCT, uncontrolled clinical trials; IM, indirect moxibustion; DM, direct moxibustion; S, significance; I, improvement; A, intervention group; B, control group.

Table 1. (Continued).

Author (y)	Study design	Disease	Sub jects	Moxa type	Period	Frequency	Repeat time	Moxibustion points	Result	Other treatment
Yoon (2011)	UCT	Hemiplegia after stroke	23	DM	1d	1 time/d	5	LI4 LI11 TE3TE5	S	X
Lee (2011)	RCT	Chronic cancer pain	A:7 B:7	DM	7d	1 time/d	1	A-shi point	S	X
Kim (2011)	UCT	Cancer pain	6	IM	7d	6 times/ wk	3	CV4, CV6, CV12, PC8, KI1	S	X
Son (2012)	CR	Chronic fatigue syndrome(CFS)	1	IM	2wks	1 time/d	1	KI1 CV4 CV8	I	O
Oh (2012)	CR	Degenerative knee arthritis with osteochondroma	2	IM	4wks	3 times/ wk	3	GB34, SP9, SP10 ST34, ST35, ST36 EX-LE5, A-shi point	I	X
Oh (2013)	RCT	Degenerative knee arthritis	A:34 B:31	IM	4wks	3 times/ wk	3	ST35, SP10, ST36 ST34, SP9, A-shi point	S	X
Moon (2015)	CR	Verruca vulgaris	3	DM	3,19,30wks	1 time/ wk	5	A-shi point	I	O
Lee (2015)	CR	Generalized morphea	1	Unclear	12wks	1 time/d	Unclear	LU9	I	O
Lee (2017)	UCT	Nocturia	31	DM	10d	1 time/d	1	CV6, CV4	I	O
Jeong (2018)	CCT	Traffic accident-Induced lumbago	A:56 B:56	IM	2wks	1 time/d	2	CV4, BL23	I	O

RCT, randomized controlled trials; CCT, controlled clinical trials; CR, case reports; UCT, uncontrolled clinical trials; IM, indirect moxibustion; DM, direct moxibustion; S, significance; I, improvement; A, intervention group; B, control group.

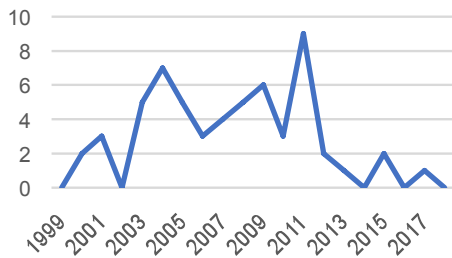


Fig. 2. Analysis of the number of studies by year.

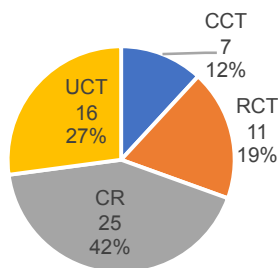


Fig. 3. Analysis of clinical study type. CCT, controlled clinical trials; CR, case reports; RCT, randomized controlled trials; UCT, uncontrolled clinical trials.

the musculoskeletal system and connective tissue were the most common and appeared in 17 studies (29%), followed by conditions/diseases of the circulatory system (14 studies, 24%), and conditions/diseases of the nervous system (7 studies, 12%). Regarding signs and symptoms, and abnormal clinical and laboratory findings that were not classified elsewhere, there were 2 studies related to Nocturnal Enuresis and 1 study related to Jue Zheng caused by Wang yang. For conditions/diseases of the musculoskeletal system or connective tissue, there were 11 lower back-related studies, including low back pain, FBSS, lumbar herniated intervertebral disc, lumbar spinal stenosis, sciatica, and 2 studies on knee pain and 2 studies on shoulder pain. Conditions/diseases of the circulatory system included 2 studies on hypertension, and 12 studies on illness after a stroke. In the illness after stroke studies, there were 5 studies related to Hemiplegic, 2 studies related to dysuria and dysphagia, and 1 study for each was related to chronic hiccup, knee joint pain, and persistent pain of the left dorsal part of the hand and wrist pain. For conditions/diseases of the nervous system, 2 studies related to peripheral facial paralysis and 1 study each for insomnia, idiopathic Parkinson's disease, conus medullaris syndrome, type of CRPS, and chronic fatigue syndrome (Fig. 4).

Analysis of the number of acupoints and acupoints used in the study

The number of acupoints used in a study varied between 1 and 10. The use of a single acupoint was the most common (14 studies), followed by 6 acupoints (8 studies). Of the studies that mentioned acupoint with A-shi point, there were 4 studies that could not accurately determine the number of acupoints (Fig. 5). A total of 83 acupoints were used in 59 studies. The most common was the

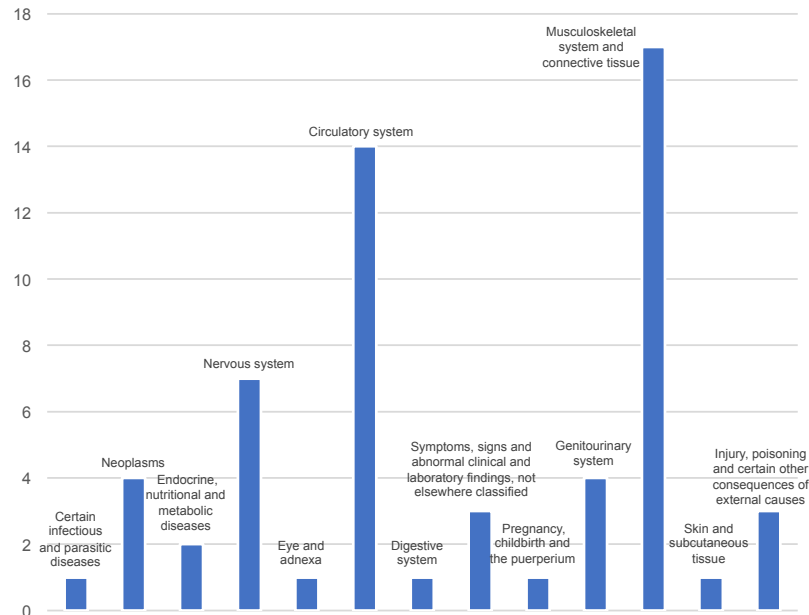


Fig. 4. Classification by subject disease according to International Classification of Diseases-10.

Table 2. Analysis of Acupoints Used in the Study.

Acupoint	No.
A-shi point	13
CV4, ST36	10
LI4, LI11, GB34, GB39, BL25	6
BL26, CV3, CV6, CV12, TE5, GV3	5
BL17, BL23, TE3, SR34	4
ST35, SP9, SP10, BL20, BL21, BL24, KI1, CV17, EX-LE5	3
Chwesu, GB14, GB30, ST4, ST32, LR3, SI9, LI16, BL43, GV2, CV8	6
BL10, BL11, BL13, BL14, BL15, BL18, BL22, BL27, BL28, BL36, BL37, BL40, BL53, BL54, BL67, CV1, GB16, GB20, GB31, GB36, GB37, GB38, GV20, LI15, LI19, LR8, LU9, PC8, SI2, SI3, SI10, SI13, SI14, SI15, SP6, ST2, ST6, ST25, ST33, TE6, TE14, TE15, TE23, EX-B2, Popliteal crease	6

use of A-shi point which was used in 13 studies. CV4 and ST36 were used in 10 studies each. LI4, LI11, GB34, GB39, BL25 were individually used in 6 studies each. Five studies each individually used CV3, CV6, CV12, GV3, TE5, and BL26 (Table 2).

#### Multiple frequency acupoint analysis by condition/disease

In studies of diabetes mellitus, both studies used ST36, CV12, BL17, BL20, BL21, and Chwesu. Where there was illness after stroke with hemiplegia, LI11, and TE5 were used in 5 studies, LI4 in 4 studies, TE3 in 3 studies, ST36, and GB39 in 2 studies each. In cases of dysphagia, both studies used CV17. Dysuria studies used CV3, CV4, CV6. For nocturnal enuresis, CV4 was used in both studies and in addition CV6 was used in 1 study. In peripheral facial palsy, 2 studies used ST4 and GB14, and in addition 1 study used ST2, ST6, TE23, LI19, LI4, ST36, CV12, CV4, and LR3. For stress urinary incontinence, CV3 was used in 2 studies, and

CV4 and CV6 was used in 1 study each. In conditions/diseases of the musculoskeletal system and connective tissue, studies of the lumbar region (including lower back pain, lumbar herniated intervertebral disc, lumbar spinal stenosis, and sciatica) which used the A-shi point were the most frequently used (7 studies), followed by BL24 and BL25 which were used in 6 studies each, BL26 in 5 studies, and BL23 in 4 studies. All 3 studies related to degenerative knee arthritis used ST35, SP9, SP10, ST34, GB34, ST36, EX-LE5, and A-shi point. For studies using a single acupoint, LU9 was used for morphea treatment, BL67 was used for breech presentation, BL11 was used for persistent pain in the left dorsal part of the hand and wrist after a stroke, GB16 was used for oculomotor nerve palsy, KI11 was used for insomnia, CV8 was used for Jue Zheng caused by Wang yang, SP6 was used for primary dysmenorrhea, and ST25 was used for constipation (Table 1).

Analysis of moxibustion type and the number of moxibustion units per point used in the study

Analysis of the type of moxibustion performed in each study indicated that 29 studies used indirect moxibustion, 29 studies used direct moxibustion, and 1 study did not mention which type of moxibustion was used. Indirect moxibustion was performed 3 times in 15 studies, once in 9 studies, twice in 3 studies, and 5 times in 2 studies. Direct moxibustion was performed 5 times in 10 studies, 3 times in 8 studies, 7 times in 4 studies once in 4 studies, 9 times in 2 studies, 10 times in 1 study and 30 times in 1 study. There were duplicate points in the study using direct moxibustion, 7 and 10 times per point, depending on the patient (Table 1).

Analysis of evidence for the acupoint, pattern identification, number of moxibustion units and time per point

Eight studies (13.5%) reported pattern identification for moxibustion treatment. There were 47 studies (49.7%) which provided evidence for the acupoint used. Four studies (6.7%) provided evidence for the number of moxibustion units and moxibustion time per point. Among the 59 studies, 1 study [22] provided complete evidence and 4 studies [22,26,50,62] (6.8%) provided evidence for the acupoint and the number of moxibustion

units and the moxibustion time per point (Fig. 6).

Evaluation according to Standards for Reporting Interventions in Clinical Trials of Moxibustion (STRICTOM) guidelines

None of the 59 studies satisfied all the entries of the STRICTOM. CR and UCT studies without a control group satisfied an average of 7.4 items out of 14 items, while RCT and CCT studies with a control group satisfied an average of 9.4 items out of 16 items. The least reported item was “Precise description of the precaution measures if any”, which was only reported in 2 of the 59 studies (3.39%) in this review. “Responses sought” was reported in 4 studies (6.8%), “Description of treatment provider” was reported in 7 studies (11.9%), “Patient posture and treatment environment” was reported in 9 studies (15.3%), “Setting and context of treatment protocol, and information and explanation to patients” was reported in 12 studies (20.3%), and “Procedure and technique for moxibustion” was reported in 28 studies (47.6%; Table 3).

Specific treatment results verified through the study

In most controlled studies, the control group showed significant effects. The studies without a control group showed significant

Table 3. Evaluation According to Standards for Reporting Interventions in Clinical Trials of Moxibustion (STRICTOM).

Item	Detail	No. of reported trials, n (%)
Moxibustion rationale	1a Type of moxibustion (direct moxibustion, indirect moxibustion, heat-sensitive moxibustion, moxa burner moxibustion, natural moxibustion)	58 (98.3)
	1b The reasoning for treatment provided, based on historical context, literature sources, and/or consensus method, with references where appropriate	47 (79.7)
	1c The extent to which treatment was varied	59 (100)
Details of moxibustion	2a Materials used for moxibustion (moxa floss, moxa cone, moxa stick, herbal patches, and their sizes and manufacturers)	46 (78.0)
	2b Names of acupoints (or location if no standard name) for moxibustion (unilateral/bilateral)	59 (100)
	2c Number of moxibustion units and/or moxibustion time per point (mean and range where relevant)	30 (50.8)
	2d Procedure and technique for moxibustion (direct/indirect, warming/sparrow-pecking technique, warming needle, moxa box, heat-sensitive moxibustion)	28 (47.6)
	2e Responses sought (warm feeling, skin reddening, burning pain, heat-sensitization phenomenon)	4 (6.8)
	2f Patient posture and treatment environment	9 (15.3)
Treatment regimen	3 Number, frequency, and duration of treatment sessions	49 (83.1)
Other components of treatment	4a Details of other interventions administered to the moxibustion group (acupuncture, cupping, herbs, exercises, lifestyle advice)	34 (57.6)
	4b Setting and context of the treatment protocol, and information and explanation to patients	12 (20.3)
Treatment provider background	5 Description of treatment provider (qualification or professional affiliation, years in moxibustion practice and other relevant experience for professional, or any special training in advance for the layman)	7 (11.9)
Control and comparator interventions	6a The rationale for the control or comparator in the context of the research question, with sources that justify the choice	16 (88.9)
	6b The precise description of the control or comparator. If another form of moxibustion or moxibustion-like control is used, provide details as for items 1-3 above	18 (100)
Precaution measures	7 The precise description of the precaution measures, if any	2 (3.39)

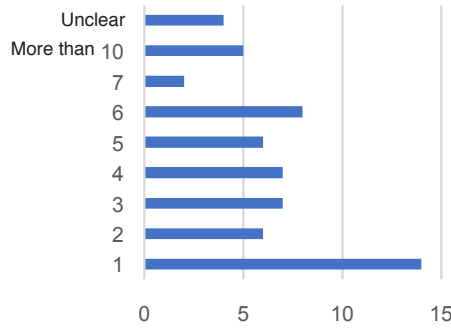


Fig. 5. Analysis of the number of acupoint.

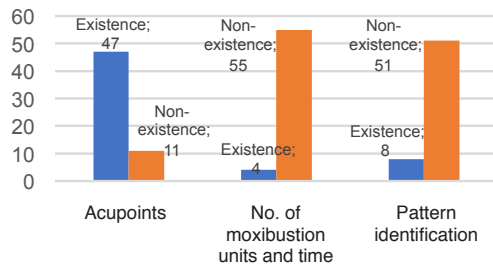


Fig. 6. Analysis of the existence of evidence.

effects or improvement after a moxibustion treatment. In the comparative study of moxibustion treatment according to acupoint of peripheral facial nerve palsy, the proximal acupoint showed superiority over a distal acupoint [39]. Moxibustion treatment studies using LI16 for shoulder pain have been shown to be more effective in the acute phase [35]. Constipation studies indicate that moxibustion treatment is significantly effective for deficiency syndrome [10]. In the treatment of cancer, moxibustion treatment was effective for cancer pain, and it was also effective in reducing psychological tension (by adjusting the autonomic nervous system) [58]. Moxibustion treatment for breech presentation and *Verruca vulgaris* was a case report, but meaningful.

**Assessment of RoB in RCT studies**

The risk of bias was assessed for 11 RCT studies using the Cochrane risk of bias tool. In “random sequence generation”, studies using a table of random numbers and a randomized code showed a low risk of bias, whilst the remaining studies showed an uncertain risk of bias due to lack of data [12,50,55,57]. In “allocation concealment,” the study that used a table of random numbers, was evaluated as having a high risk of bias because of the possibility of exposing the assignment order. However, although the table of random numbers was used, the study was conducted by the assigned independent statistician, and was evaluated as having a low risk of bias [57]. The rest of the study showed an uncertain risk of bias without mention. “Blinding of participants and personnel” was considered impossible because the characteristics of moxibustion intervention, and most of the studies were evaluated as having a high risk of bias (Fig. 7). However, with

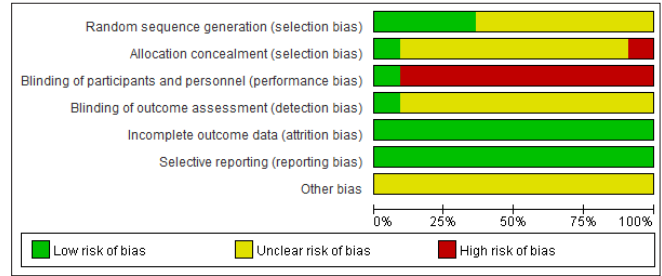


Fig. 7. Risk of RCT bias. RCT, randomized controlled trials.

	Random sequence generation (selection bias)	Allocation concealment (selection bias)	Blinding of participants and personnel (performance bias)	Blinding of outcome assessment (detection bias)	Incomplete outcome data (attrition bias)	Selective reporting (reporting bias)	Other bias
Choi 2003	+	-	-	+	+	+	?
Doh 2009	?	?	-	?	+	+	?
kang 2000	?	?	-	?	+	+	?
Kang 2001	?	?	-	?	+	+	?
Kim 2005	?	?	-	?	+	+	?
Kim 2011	+	?	-	?	+	+	?
Lee 2008	?	?	-	?	+	+	?
Lee 2011	+	+	+	?	+	+	?
Oh 2013	?	?	-	?	+	+	?
Park 2011	+	?	-	?	+	+	?
Yun 2003	?	?	-	?	+	+	?

Fig. 8. Risk of RCT bias summary. RCT, randomized controlled trials.

1 study [57], the experimental group and the control group used moxibustion, but the control group removed moxibustion in the state by 1 cm. As a result, the study participants judged that there was no difference. The study was deemed to have a low risk of bias. In “Blinding of outcome assessment,” only 1 study [12] referred to an independent evaluator and was therefore determined to have a low risk of bias. The rest of the studies either did not mention bias evaluation or had an uncertain risk of bias. In “Incomplete outcome data” and “Selective Reporting,” all studies showed a low risk of bias. There was no mention in “Other bias,” so an accurate judgment could not be made (Fig. 8).



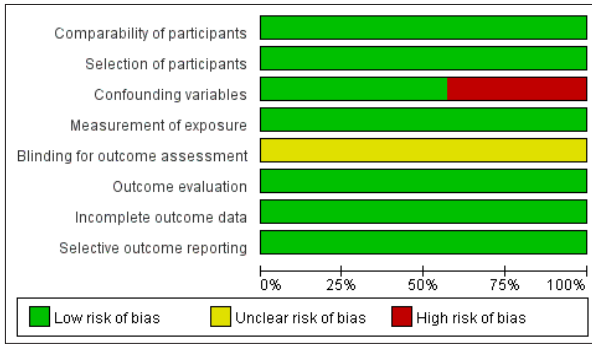


Fig. 9. Risk of CCT bias. CCT, controlled clinical trials.

	Comparability of participants	Selection of participants	Confounding variables	Measurement of exposure	Blinding for outcome assessment	Outcome evaluation	Incomplete outcome data	Selective outcome reporting
Chang 2004	+	+	+	+	?	+	+	+
Choi 2008	+	+	-	+	?	+	+	+
Jeong 2018	+	+	+	+	?	+	+	+
Kim 2004	+	+	+	+	?	+	+	+
Kim 2006	+	+	-	+	?	+	+	+
Kwon 2000	+	+	-	+	?	+	+	+
Lee 2011	+	+	+	+	?	+	+	+

Fig. 10. Risk of CCT bias summary. CCT, controlled clinical trials.

**RoBANS in controlled clinical trial studies**

The risk of bias was assessed for 7 CCT studies using the RoBANS tool. In “Comparability of participants” and “Selection of participants,” all the studies confirmed that the intervention group and the control group were the same population, and were subsequently recruited. The risk of bias for those studies was evaluated as low. In “confounding variables,” 1 study [8] did not identify major confounding variables that could affect the patient’s symptoms such as gender, age, or injury site, and 2 studies [30,39] did not consider it in the analysis stage. As such, the risk of bias was determined to be high. In the other 3 studies, the risk of bias was evaluated as low, considering the differences in the analysis group. In “Measurement of exposure,” all studies were assessed as low risk of bias because all studies obtained intervention measurements from reliable records, such as medical records, or were measured more than once. “Blinding for outcome assessment” items were determined to have an uncertain risk of bias because there was no relevant mention in all studies. For “Outcome evaluation,” all studies evaluated the results with a tool that has

proven reliability, validity, and objective evaluation methods, and were deemed to have low risk of bias. The “Incomplete outcome data” item was evaluated as low risk of bias because 5 studies had no missing values and 2 studies [21,52] reported missing values but provided clear reasons for the missing values (Fig. 9). Although there are no pre-published protocols in any of the studies, all the results defined in the study were reported. So, those studies were rated as low risk of bias for the “Selective outcome reporting” item (Fig. 10).

**Discussion**

Moxibustion is an external treatment that works by placing *Artemisiae Argi Folium* or other drugs on the acupoint of the skin, injecting the warm energy of moxibustion into the skin, and moving Qi-blood warmly through the action of Meridian [66]. In Korean traditional medicine, moxibustion treatment was used prior to the Qin-Han Period, and many developments were made before the Song-Yuan Dynasty, but after the Song Dynasty the tendency to value acupuncture led to the decrease in moxibustion popularity. Moxibustion in modern times is widely used because of its simplicity, few side effects, and widely reported clinical effects [67]. Based on the recent lack of research on moxibustion treatment in Korea, this study reviewed studies on moxibustion evidence based treatment over the past 20 years to determine trends of clinical practice.

Looking at the status of moxibustion treatment publications by year, studies were actively conducted from 2000 to 2011 when 9 studies were published, there were only 0-2 studies published every year from 2012 to 2018. This is in contrast to the increased rate of moxibustion treatment reported in health insurance statistics. This indicates that there is a lack of Korean moxibustion clinical studies. It is necessary to verify the clinical effects of moxibustion treatment, and establish systematic treatment methods for various clinical presentations. The most common study was the CR (25 cases, 42%) which had the lowest objectivity, there were 16 cases (27%) of UCT, 11 cases (19%) of RCT, and 7 cases of CCT (12%). Patient numbers were low even in RCT where patient numbers were not more than 100 patients. Considering the current rising issue of evidence-based medicine, the need for larger studies is urgent.

Classifying the disease/condition treated by moxibustion was performed according to the ICD-10. The 17 studies (29%) of conditions/diseases of the musculoskeletal system and connective tissue and 14 studies (24%) conditions/diseases of the circulatory system account for a large proportion of the study. This correlates with current inpatient and outpatient data from Oriental medical clinic and Oriental medical hospital [3]. According to health insurance statistics, the frequency of recurrent conditions/diseases treated with oriental medicine in the past 3 years were listed as musculoskeletal system or connective tissue in positions 1-6, hemiplegia was 7th, and stroke was 8th [3]. Moxibustion treatment in *«Donguibogam»* [68] indicated that deficiency-type patients should undergo moxibustion treatment so that Hwa-Qi helps source Yang, and excess-type patients should also utilize moxibustion treatment so that the pathogenic factor can spread along Hwa-Qi. Furthermore, cold-type and heat-type should receive moxibustion treatment to warm its energy again or spread out the heat that is gathered outside, respectively. These findings demonstrated that moxibustion treatment was effective in treating the condition/disease regardless of cold-heat type and deficiency-excess type. Antihypertensive, analgesic, anti-inflammatory effects have all been reported with moxibustion treatment, along with the improvement of anemia, liver function recovery, muscle tissue

recovery function, and immune function enhancement [4]. Based on current literature, clinical studies in various conditions/diseases using moxibustion treatment should be explored.

The total of 83 acupoints were used accumulatively over the entire study. A-shi point was the most frequently used in 13 studies. CV4 and ST36 were each used in 10 studies. Six studies used LI4, LI11, GB34, GB39, BL25 each. CV3, CV6, CV12, GV3, TE5, and BL26 were each used in 5 studies. The most studied conditions/diseases of the musculoskeletal system and connective tissue mainly used A-shi point. This is a small burn in the local area with moxibustion treatment, the degradative products of proteins in the burnt tissue promote the local blood flow and facilitate the transport of inflammation-related cells and nutrients necessary for local edema absorption and tissue repair. A-shi point promotes the inflammatory response and helps repair damaged tissues, and is the most reasonable method for pain control and tissue recovery [67]. CV4 has the effect of increasing kidney function to solidify the root, increasing the source qi and restoring Yangqi. It was used for the treatment of conditions/diseases such as incontinence, difficulty urinating, nocturnal urination. ST36 is a gaggipalcheohyeol, which is used extensively for conditions/diseases of the lower limbs, and improves the function of the lower extremities. Li's study [69] supported ST35 foot stimulation to promote the secretion of opiate endocrine substances, and these substances inhibited vascular contraction mechanisms of the sympathetic nerve. Furthermore, it was reported that ST35 may be used for the treatment of diabetes and hypertension. Reviewing acupoints for both studies, it was observed that diabetes mellitus studies used ST36, CV12, BL17, BL20, BL21, and Chwesu. CV17 was used for dysphagia, and CV3, CV4, and CV6 were used for dysuria. Acupoints were used in 59 studies and appeared in most of the literature. There were 47 studies (49.7%) which developed the basis for acupoints. There were only 4 studies (6.7%) provided the basis for the number of moxibustion units and moxibustion time per point. Most of the studies were conducted without a valid basis for treatment. In the future, research conducted on the relationship between various acupoints and conditions/diseases should be based on validated evidence. Eight studies (13.5%) reported pattern identification for moxibustion treatment. It is believed that the benefits of Oriental medicine, which differ depending on the pattern identification reflecting the physiology of the individual, even in the same condition/disease, were not applied. This further reduces the reproducibility of the treatment.

None of the 59 studies satisfied all the entries of STRICTOM. CR and UCT studies without a control group, satisfied an average of 7.4 items for 14 items. RCT and CCT studies with a control group, satisfied an average of 9.4 items for 16 items. Most studies had a low score. Reports on the treatment with moxibustion should be described in detail, along with a detailed report on the patient progress in the study. This would increase the reproducibility of the study, and improve the overall quality of the study. The least reported item was "Precise description of the precaution measures, if any," which was reported in 2 out of the 59 studies (3.39%). The items with a response rate of less than 50% were not related to moxibustion treatment but were non-treatment items such as preventive measures, description of the operator, posture, environment during the procedure, and explanation of the procedure to the subject. In short, non-treatment items will not affect the treatment effect. However, reporting on the operator, treatment environment, and explanations are emphasized. To increase the validity of the treatment, it is necessary to describe the items.

For RCT and CCT, a quality evaluation was performed for the risk of bias evaluation. RCT used the Cochrane's Risk of Bias tool

and CCT used the RoBANS tool. RCT studies showed that the items have not been described, and most items have been rated as having an uncertain risk of bias. With "Blinding of participants and personnel," the blinding of study participants and researchers was considered impossible because of the characteristics of moxibustion intervention, and most of the studies were evaluated to have a high risk of bias. However, in 1 study, the experimental group and the control group used moxibustion, but the control group removed the moxibustion faster than the experimental group. However, the control group recognized that they had moxibustion treatment. Therefore, this study was considered low risk of bias. In "Blinding of Outcome Assessment," only 1 study mentioned an independent evaluator and was found to have a low risk of bias. RCT are highly regarded for evidence-based medicine, and RCT research, based on detailed techniques should be conducted. Looking at the CCT in "Confounding variables," 3 studies were rated as having a high risk of bias because of a lack of consideration for confounding variables. "Blinding for outcome assessment" was rated as having an uncertain risk of bias because it did not mention confounding variables in all studies. Greater effort should be made towards accurately describing research methods to avoid deterioration of study quality and impairment of the validity and significance of clinical trial results.

A limitation of this study was that the database search was limited to NDSL, OASIS, and RISS only, and did not cover all studies. The research articles included in this study were subjected to limited time period parameters, and the moxibustion treatment had to be performed by a Korean Medicine doctor. This study was also limited by unclear or absent evaluation of research methods and results in some of the studies. Therefore, the current findings may not completely encompass current research trends in moxibustion treatment. There were several aspects to these studies that could not be used as evidence for inclusion in clinical practice. As the use of moxibustion treatments increases, so does the need for academic study. The current study supports the need for further moxibustion research in Korea to secure an objective basis for clinical treatment applications.

## Conclusion

Analysis of 59 clinical studies related to moxibustion treatment in Korea over the last 20 years from 1999 to 2018, show that since 2000 moxibustion treatment (effective clinical research performed by a Korean traditional medicine doctor) has been conducted. However, the number of studies that fit this study's inclusion criteria has decreased since 2011 (9 studies) to 0-2 publications per year until 2018. Most studies were case reports, and the RCT were small-scale and did not fulfill all STRICTOM criteria and risk of bias evaluation items. The most common conditions/diseases were musculoskeletal disorders and joint conditions. A total of 83 acupoints were utilized over all conditions. The most used acupoint was the A-shi point in 13 studies. CV4 and ST36 were used for 10 studies each. Six studies used LI4, LI11, GB34, GB39, and BL25 each. CV3, CV6, CV12, GV3, TE5, and BL26 were each used for 5 studies. Indirect moxibustion most commonly used 3 units per point and direct moxibustion 5 units per point.

In this study, the need for large-scale RCT of moxibustion treatment in Korea was identified. The detailed description of study methods and results provide evidence for the safety and efficacy of moxibustion treatment, which will play a key role in future preventive and therapeutic aspects of treatment.

## Conflicts of Interest

The authors have no conflicts of interest to declare.

## References

- [1] Son CG. Overview for pattern and results of moxibustion-derived clinical trials. *Korean J Acupunct* 2009;26:41-49. [in Korean].
- [2] Translating Yeoghaebyeonju Hwangjenaeyeong Youngchu 48th. Seoul (Korea): Yeogang; 2001. 546 p. [in Korean].
- [3] Kosis. Medical care benefit cost evaluation performance by five major oriental medicine items. Seoul (Korea): Health Insurance Review and Assessment Service; c2004-2013, 2018.
- [4] Park HJ, Son CG. Overview for moxibustion-related researches worldwide. *Korean J Acupunct* 2008;25:167-174. [in Korean].
- [5] The Cochrane Collaboration [Internet]. Cochrane handbook for systematic reviews of interventions. Version 5.0.2. [cited 2017 Mar 10]. Available from: <http://handbook.cochrane.org/v5.0.2/>.
- [6] Kim SY, Park JE, Seo HJ, Lee YJ, Jang BH, Son HJ et al. NECA's guidance for undertaking systematic reviews and meta-analyses for intervention, 1st ed. Seoul (Korea): National Evidence-based Healthcare Collaborating Agency. 2011. p. 65-78, 94-100, 131.
- [7] Kang KS, Jeong EJ, Moon SK, Ko CN, Joh KH, Kim YS et al. Clinical Study on the Effects of Moxibustion for Post-stroke Voiding Dysfunction. *J Korean Med* 2000;21:236-241. [in Korean].
- [8] Kwon SJ, Song HS, Kim KH. The Influence of Moxibustion and Basic Compound Therapy on Peripheral Facial Paralysis. *J Korean Acupunct Moxib Soc* 2000;17:160-171. [in Korean].
- [9] Park JW, Jeon WH, Kim JS, Hong JH, Hong SS, Park SK et al. A Case of Moxibustion Therapy on Chronic Hiccups after Cerebral Infarction. *J Int Korean Med* 2001;22:109-112. [in Korean].
- [10] Kang SI, Lim CW, Park WT, So WR, Song MJ, Kim YS. The Clinical study of acupuncture and moxibustion therapy on ST25 for constipation. *J Korean Acupunct Moxib Soc* 2001;18:125-134. [in Korean].
- [11] Lee BH, Kim CH, Seo JC, You HM, Jang KJ, Song CH et al. The Effects of Decrease of Blood Pressure on Hypertension Patients by Moxibustion. *J Korean Acupunct Moxib Soc* 2001;18:70-76. [in Korean].
- [12] Choi YS, Kim TK, Jung WS, Moon SK. Effects of Moxibustion on the Hemiplegic Upper Extremity After Stroke. *J Intern Korean Med* 2003;24:283-289. [in Korean].
- [13] Kim CG, Chan SC, Cho SW, Lee IS. Effect of The Drug-Pad Moxibustion Caulerizer for Low Back Pain. *J Orient Rehabil Med* 2003;13:19-26. [in Korean]
- [14] Woo HS, Seo DM, Kim JD, Park SM, Kim HD, Byun IJ et al. Clinical Observation on Oculomotor Nerve Palsy treated by Moxibustion. *Korean J Orient Med* 2003;24:149-153. [in Korean].
- [15] Lim SM, Kim HJ. The Clinical study of moxibustion therapy on stress urinary incontinence after menopause. *J Korean Obstet Gynecol* 2003;16:170-179. [in Korean].
- [16] Yun SP, Kim TK, Kim LD, Kim TH, Jung WS, Moon SK et al. Effects of Moxibustion on the Recovery of Urinary Disturbance in stroke Patients. *J Intern Korean Med* 2003;24:651-661. [in Korean].
- [17] Kim KH, Jung IT, Kim KT, Woo HS, Kim YS, Koh HK et al. Persistent pain of left dorsal hand and wrist was improved by moxibustion therapy. *J Spine Joint Korean Med* 2004;1:31-35. [in Korean].
- [18] Lee HM, Jo HS, Shin WJ, Seu SH, Park DI, Hong HS et al. Clinical Study of Moxibustion on The Complication of Diabetes Mellitus. *Korean J Orient Med Physiol Pathol* 2004;18:294-300. [in Korean].
- [19] Choi KJ, Hwang MW, Lim J, Lee SK, Koh BH, Song IB. A case of Moxibustion at KI1 for a Soyang in patient with Insomnia. *J Sasang Constitut Med* 2004;16:128-133. [in Korean].
- [20] We JS, Won SH, Hwang JS, Sun SH, Ahn YM, Sohn SH et al. The Comparison of Effectiveness between Acupuncture and Its Cotreatment with direct moxibustion to Low back pain patient. *J Korean Acupunct Moxib Soc* 2004;21:221-231. [in Korean].
- [21] Kim PW, Lee CW, Kim WI, Youn HM. The Effects of Moxibustion on the Stress Urinary Incontinence in Middle-aged Women. *J Korean Acupunct Moxib Soc* 2004;21:93-106. [in Korean].
- [22] Park YE, Choi S, You HK, Ryoo KS, Cho JH, Jang JB et al. A case report of breech presentation. *J Korean Obstet Gynecol* 2004;17:158-165. [in Korean].
- [23] Chang JW, Hong JA, Lee YJ, Park SK, Kim MC, Jyung IT. The Effect of Moxibustion on Rehabilitation after stroke. *J Orient Rehabil Med* 2004;14:97-108. [in Korean].
- [24] Park SM, Lee SH, Jung JC, Kim KH, Park HJ, Lim S et al. Effect of Moxibustion Treatment on UPDRS and Heart Rate Variability in Idiopathic Parkinson's Disease Patients. *J Korean Med* 2005;26:176-181. [in Korean].
- [25] Kim TH, Na BJ, Rhee JW, Lee CR, Park YM, Choi CM et al. The Effect of Moxibustion at Chonjung (CV17, Shanzhong) on Patients with Dysphagia after Stroke. *J Intern Korean Med* 2005;26:353-359. [in Korean].
- [26] Kim BS, Jang IS, Yeo JJ, Lee TH, Son DH, Se ES et al. Effect of Choksamni Moxibustion on Blood Pressure Elevation in Hypertensive Patients: A Randomized Controlled Trial. *J Korean Med* 2005;26:66-73. [in Korean].
- [27] Cho YC, Ra KW, Chung WS. A Case Report about the Sprain Treated with Direct Moxibustion on Painful Point of Injured Ligament. *J Orient Rehabil Med* 2005;15:163-169. [in Korean].
- [28] Choi JH, Ko YJ, Lee SH, Kang SK, Lee YH. Case Report of Moxibustion Therapy for an Osteoarthritis Patient with stroke. *J Spine Joint Korean Med* 2005;2:27-34. [in Korean].
- [29] Hwang JS, Lee DH, Park HS. The Clinical Study on the Effects of Moxibustion to FBSS (Failed Back Surgery Syndrome). *J Korean Acupunct Moxib Soc* 2006;23:67-75. [in Korean].
- [30] Kim YI. Comparison study acupuncture treatment with Acupuncture & Moxibustion combined treatment for frozen shoulder patients. *J Haehwa Med* 2006;15:1-7. [in Korean].
- [31] Yoon DE, Jo BK, Bae JI, Gu JS, Kim JW, Lee HM et al. A Study on the Variations of the Trunk Temperature and the Clinical Test for the Diabetics by the Artemisia Extract Moxibustion Method. *J Korean Med* 2006;27:165-183. [in Korean].
- [32] Kang JH, Kim SJ, Park JW, Hong SY, Yoon IJ, Heo DS et al. The Clinical Report on the 3 Cases of Sciatica treated on Direct Moxibustion. *J Pharmacopuncture* 2007;10:139-146. [in Korean].
- [33] Choi YK, Kang MS. A Case Report of Ge-yan-jiu and Herbal Medicine complex Treatment on Juezheng caused by Wang yang. *J Intern Korean Med* 2007;28:187-192. [in Korean].
- [34] Park SH, Chang SY, Cha JH, Roh JH, Lee EY. A Clinical study on Lumbar Herniation of Intervertebral Disc treated with Direct moxibustion. *J Haehwa Med* 2007;10:17-24. [in Korean].
- [35] Hur B, Yim YK. Study on clinical effects of indirect moxibustion at Geogol (LI16) on the shoulder pain. *J Haehwa Med* 2007;16:211-216. [in Korean].
- [36] Cho KH, Kim TH, Jung WS, Park SU, Moon SK, Park JM et al. The effectiveness of moxibustion on dysphagia after stroke; A Case Series. *Orient Pharm Exp Med* 2008;7:579-582.
- [37] Lee SW, Kim JH, Lee JD. A Case Study of the Effect of Moxibustion on Coldness and Pain of Both Lower Extremity from the Conus Medullaris Syndrome. *J Spine Joint Korean Med* 2009;5:57-65. [in Korean].
- [38] Lee SH, Kim JK, Son YH, Jeong HY, Kim JH, Kwon JN et al. A Clinical Study of Moxibustion Therapy's Effect on Functional Recovery in Hemiplegia on Stroke. *J Intern Korean Med* 2008;29:278-284. [in Korean].
- [39] Choi CH, Song HS. Effect of Moxibustion on Peripheral Facial Paralysis According to Selection Method of Acupoints. *J Korean Acupunct Moxib Soc* 2008;25:1-8. [in Korean].
- [40] Chiang SY, Bang SP, Jeong YP, Jung HK, Lee JE, Lee JS et al. The Clinical Trial of SP6 (Sanyinjiao) Moxibustion on the Primary Dysmenorrhea. *J Korean Acupunct Moxib Soc* 2008;25:55-65. [in Korean].
- [41] Doh MH, Kim TY. Effects of the Moxibustion Therapy on the Pain Decrease and Joint Recovery with Degenerative Knee Arthritis. *J Soc Prev Korean* 2009;13:81-92. [in Korean].
- [42] Lee SH, Lee SW, Kim YJ, Chung JY, Kwon HJ, Choi DY et al. Clinical Observation of Improvement Made by Moxibustion on a Case of Myelopathy-hand Patient caused by Cervical Myelopathy. *J Korean Acupunct Moxib Soc* 2009;26:251-260. [in Korean].
- [43] Park HA, Lee CH, Lee SN. Chronic Low Back Pain Treated with Direct Moxibustion: A Case Report. *J Spine Joint Korean Med* 2009;6:9-14. [in Korean].
- [44] Kim MK, Lee JS, Lee SH, Jung HS, Choi WC, Kim KS. A Clinical Case of Patient with Cancer Pain Treated by Moxibustion. *J Korean Tradit Oncol* 2009;14:53-59. [in Korean].
- [45] Jo BK, Lee YH. Development of the Special Heat Generating Terminal of Caulerizer for Prostate. *J Korean Acupunct Moxib Soc* 2009;26:41-48. [in Korean].
- [46] Cheon JJ, Hwang HS, Park JY, Jung KH, Kim MS, Lee TH et al. Clinical Study on the Case of Low Back Pain Treated with Direct Moxibustion. *J Spine Joint Korean Med* 2009;6:83-93. [in Korean].
- [47] Kim JY, Lim HW, Kim JH, Kwon K, Kim JH. The Five Cases Report about Enuretic Children with Moxa Bucket Moxibustion on Gwanwon (CV4). *J*

- Korean Orient Pediatr 2010;24:159-168. [in Korean].
- [48] Kim JY, Lee UI, Seon JI, Lim SK, Kim JI. A Case Report of the Patient with Low Back Pain Resulting from Spinal Stenosis Treated by Moxibustion Therapy. *J Spine Joint Korean Med* 2010;7:21-27. [in Korean].
- [49] Yoon SK, Lee SH, Jung WS, Bae YM. Noninvasive Estimation of Moxibustion Effect on Peripheral Blood Flow by Doppler Ultrasound in Stroke Patients with Hemiplegia: Case Series. *J Korean Med* 2010;31:178-186. [in Korean].
- [50] Kim MS, Park JY, Choi YJ, Yoon KJ, Jeon JC, Lee TH et al. Clinical Effects of Indirect Moxibustion Treatment with General Acupuncture on HIVD Patients in Comparison with General Acupuncture Only. *J Korean Acupunct Moxib Soc* 2011;28:65-75. [in Korean].
- [51] Lee DW, Shin MS. Case Series of 5 Failed Back Surgery Syndrome Patients Who were Treated by Direct Moxibustion Therapy. *Korean J Acupunct* 2011;28:233-244. [in Korean].
- [52] Lee JY, Park SH, Han SY, Park JY, Lee HJ. A Case-control Study of The Effect of Cotreatment with Sinseon Moxibustion on Low Back Pain of HIVD Patients. *J Korean Acupunct Moxib Soc* 2011;28:77-83. [in Korean].
- [53] Cho HW, Shin BC, Shin MS, Hwang EH, Sul JU. Moxibustion Therapy for the Pain Relief in Patient with Type 1 CRPS: a Case Report. *J Orient Rehabil Med* 2011;21:79-87. [in Korean].
- [54] Choi YH, Yoon IJ. A Clinical Case Study on Intersection Syndrome with Direct Moxibustion. *J Orient Rehabil Med* 2011;21:149-153. [in Korean].
- [55] Kim MS, Park JY, Choi YJ, Jin YK, Lee CG, Lee EY et al. Comparative Study of Treatment Effect between Indirect Moxibustion Treatment with General Acupuncture and General Acupuncture Only on Treatment for Neck Pain Caused by Whiplash Injury. *J Korean Acupunct Moxib Soc* 2011;28:85-91. [in Korean].
- [56] Yoon SK, Kwon SW, Seo YR, Park JY, Im JW, Park JY et al. The Effects of LI4, TE3, TE5 and LI11 Moxibustion on Radial Artery Blood Flow and Variability in stroke Patients with Hemiplegia. *J Korean Med* 2011;32:50-65. [in Korean].
- [57] Lee JS [Thesis]. The Efficacy and Safety of Moxibustion with regard to Cancer Pain in Advanced Cancer Patients: A Randomized, single-Blinded, and Placebo-Controlled Pilot study. Department of Clinical Korean Medicine Graduate School, Kyung Hee University; 2011. [in Korean].
- [58] Kim OH, Choi JE, Yoon JW, Yoo HS. The Effects of Moxibustion on Heart Rate Variability in Cancer Patients. *J Korean Tradit Oncol* 2011;16:15-31. [in Korean].
- [59] Son CG. Case Report of Chronic Fatigue Syndrome Treated with Salt-Indirect Moxibustion. *J Korean Med* 2012;33:81-85. [in Korean].
- [60] Oh MJ, Song HS. Effect of Moxibustion Therapy on the Degenerative Arthritis of knee Joint with Osteochondroma. *J Korean Acupunct Moxib Soc* 2012;29:111-117. [in Korean].
- [61] Oh MJ, Song HS. Effect of Moxibustion Therapy on Ryodoraku Score of the patients with Degenerative Arthritis of Knee Joint. *J Korean Acupunct Moxib Soc* 2013;30:9-15. [in Korean].
- [62] Moon YK, Jeong WY, Shin JH, Kim YB, Nam HJ, Kim KS. Three Cases of Verruca Vulgaris Treated Mainly with Gwakhyangjeonggisangamibang and Moxibustion. *J Korean Med Ophthalmol Otolaryngol Dermatol* 2015;28:93-101. [in Korean].
- [63] Lee HY, Kim SY, Cho MK, Choi JY, Hong MA, Lee JH et al. A case report of generalized morphea treated with herbal medication and moxibustion. *J Korean Med* 2015;36:104-113. [in Korean].
- [64] Lee DK, Mo MJ, Lee JW, Park AR, Kim ES, Koh JY et al. A Prospective Study of the Effect of Direct Moxibustion for Treatment of Nocturia. *J Intern Korean Med* 2017;38:689-697. [in Korean].
- [65] Jeong HG, Kwon OH, Park JH, Kim SG, Kim YH, Lee JY et al. Effect of Korean Medicine Combined with Electric Moxibustion in Patients with Traffic Accident-Induced Lumbago. *J Acupunct Res* 2018;35:193-199. [in Korean].
- [66] Korean Acupuncture & Moxibustion Medicine Society Textbook Compilation Committee. The acupuncture and moxibustion medicine. Gyeonggi (Korea): Jipmoondang. 2012. p. 1051-1060. [in Korean].
- [67] Woo HS, Lee YH, Kim CH. The Review and Study Trend of Moxibustion. *J Korean Acupunct Moxib Soc* 2002;19:1-15. [in Korean].
- [68] Huh J. Treasured Mirror of Eastern Medicine. Gyeongnam (Korea): Treasured Mirror of Eastern Medicine publishing company; 2006. 2280 p.
- [69] Li P, Sun FY, Zhang AZ. The effect of acupuncture on blood pressure the interrelation of sympathetic activity and endogenous opioid peptides. *Acupunct Electrother Res* 1983;8:45-56.