Review

The Practice of Korean Medicine: An Overview of Clinical Trials in Acupuncture

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Acupuncture, one of the Oriental medical therapeutic techniques that can be traced back at least 2500 years, is growing in popularity all over the world. Korea has continued to develop its own unique tradition of medicine throughout its long history, and has formed different types of acupuncture methods. The purpose of this review is to summarize clinical case studies in acupuncture and related therapies, such as acupressure, electric acupuncture, auricular acupuncture and moxibustion in Korea. A survey of Korean journals revealed that a total of 124 studies were published from 1983 to 2001. Results obtained from the survey showed that most clinical studies using acupuncture, electric acupuncture, moxibustion and other traditional therapies could alleviate a relatively broad range of medical problems. However, it should be emphasized that almost all clinical case studies published in various local journals did not follow the ‘good clinical practice’ with respect to regulatory aspects. Since they were not conducted using the randomized double-blinded controls with a large sample size, all the results should be considered as therapeutic indications. This review is an attempt to show the scope of acupuncture in our country and the kind of diseases, after many years of clinical experience, that were deemed valid targets for clinical trials.

Keywords: acupuncture – clinical study – Korean acupuncture

Introduction

Acupuncture, one of the Oriental medical therapeutic techniques inherited from ancient East Asia, is gaining popularity in the West as an alternative and complementary therapeutic intervention (1). Acupuncture is now being used in Western medicine to treat postoperative-induced and chemotherapy-induced nausea and vomiting, postoperative dental pain, drug addiction, stroke rehabilitation and asthma (2). Korea has continued to develop its own unique traditional medicine throughout its long history, and has formed different types of acupuncture methods, apart from those of traditional Chinese medicine. An individualized approach based on constitutional energy traits and practical approaches applying new therapeutic modalities have been developed for treatment of disorders (3).

A large number of clinical studies using acupuncture have been performed to demonstrate its efficacy for many kinds of diseases, such as pain (headache, facial pain, neck pain, shoulder pain, lower back pain and knee pain), stroke, facial palsy and other diseases in Korea. A wide range of control groups were used in these studies. Acupuncture and acupuncture-related therapies have been compared with various forms of control acupuncture, standard care, no treatment, baseline conditions and placebo acupuncture. These inconsistencies...
make the task of designing and performing systematic reviews or meta-analyses more difficult. However, non-controlled clinical trials might also be useful for the overview that they provide of what is known so far, with data that may inform future research. This review is an attempt to show a variety of applications for acupuncture treatments performed by the traditional Korean medical sector.

**Clinical Studies Using Acupuncture Treatment in Korea**

**Acupuncture for Pain**

**Headache**

Lee and Kim (4) analyzed the effect of acupuncture treatment at trigger points in 27 patients with headache. Lee et al. (5) compared the effect of acupuncture at trigger points with the effect of acupuncture at remote acupuncture points in patients who were diagnosed as having tension-type headaches. A clinical study of auricular acupuncture was also done in 55 patients with headaches (6). Clinical studies of acupuncture and auricular acupuncture for tension-type headaches were also performed (7,8) (Table 1).

**Facial Pain**

Temporomandibular disorder (TMD) is a musculoskeletal problem of the masticatory system and is quite commonly treated by acupuncture in the general population. It was reported that 8 and 10 cases, respectively, of TMD were treated by acupuncture (9,10). Wang et al. (11) treated by Dong-Qi acupuncture and subjectively evaluated TMD and facial pain (Table 2).

**Neck Pain**

Chun and Lee (12) treated patients with chronic neck pain by using electric acupuncture (0.3 × 40 mm, 3.5–12 Hz, 9 V). Kim and Lee (13) compared the group treated by both acupuncture and manipulation (chuna) treatment with the group only treated by acupuncture. A clinical study investigated the clinical applications of Oriental medical therapies including acupuncture treatment together with herbal therapy and hot pack for patients complaining of cervical pain caused by traffic accidents (14). It was reported that acupuncture treatment was effective in 50 patients with cervical pain (15). Lee and Lee (16) treated 25 patients with neck pain with electric acupuncture together with herbal therapy, cupping therapy and hot pack. It was also reported that acupuncture was effective in treating 50 patients with herniated cervical disc (17) (Table 3).

**Shoulder Pain**

Forty-three patients suffering from frozen shoulder during physical exercise were treated by acupuncture, moxibustion and electric acupuncture, and evaluated with Apley scratch...
A total of 16.3% of them reported that the results of treatment were excellent and 30.2% of them reported that they were good (18). Cho and Lee (19) showed the correlation between digital infrared thermography image (DITI) data and changes in clinical symptoms after acupuncture treatment in patients with frozen shoulder (Table 4) (Fig. 1).

**Low Back Pain**

A series of 20 cases with lumbar herniated disc disease were treated by acupuncture (20). It was reported that acupuncture and herbal medicine alleviated the symptoms of the herniation of lumbar intervertebral disc (21–25). It was also reported that bee venom acupuncture (BVA) was beneficial for treating herniated intervertebral disc (HIVD) (26). Park et al. (27) performed clinical studies using acupuncture and manipulation treatment on 30 HIVD patients. It was found that microcurrent electrical neuromuscular stimulation was significantly effective in decreasing the visual analog scores of patients with lower back pain (28). Park et al. (29) reported a clinical study of the stability of the lumbosacral angle of 69 patients suffering from lower back pain. The morphological changes were demonstrated by computed tomographic scan examination of acute HIVD patients who underwent Oriental medical treatment (30).

A clinical study compared acupuncture with electric acupuncture for patients with HIVD (31). Park and Lee (32) compared the effect of electric acupuncture with the effect of Dong-si acupuncture on patients with HIVD. Lee and Hwang (33) compared electric acupuncture with electric acupuncture and Saam acupuncture in HIVD patients. Yoon et al. (34) compared acupuncture at A-shi points with acupuncture on acupuncture points in HIVD patients. Chae et al. (35) compared conventional acupuncture with Eight constitution acupuncture and demonstrated that Eight constitutional acupuncture was more beneficial than conventional acupuncture for the treatment of HIVD patients.

Electric acupuncture decreased the frequency of radiating pain in lumbar spondylosis (36). Clinical studies evaluated Oriental medical treatment and manipulation therapy in patients with scoliosis (37,38). Kim (39) reported the results of 96 patients suffering from sciatica with lower back pain treated by acupuncture and herbal medicine. It was reported that acupuncture, moxibustion and herbal medicine were useful for acute back pain (40). Lee and Yin (41) also reported a clinical study of BVA on ankylosing spondylitis. Lee et al. (42) performed a clinical study on acupuncture for stable thoracolumbar vertebral fractures. It was reported that acupuncture, electric acupuncture, acupuncture at Hua-Tuo-Jia-Ji-Xue were useful for the treatment of thoracolumbar compression fracture (43–45). Han (46) treated degenerated stenosis patients (37 cases), and Kim et al. (47) evaluated the clinical results of the spondylolisthesis patients treated by Oriental medical methods.

Lee et al. evaluated acupuncture treatment for HIVD and stable compression fracture patients using DITI (48,49).
| Author name(s) | Condition treated | Number of points | Type of acupuncture | Length and number of Tx | Other treatments | Assessment | Results of acupuncture therapy | Statistical analysis |
|---------------|-------------------|------------------|---------------------|--------------------------|------------------|------------|--------------------------------|---------------------|
| Chun and Lee (12) | Cervical pain | 34 | EA (0.3 × 40 mm low frequent, 3.5–12 Hz, 9 V) | 15 min various times | Infra-red, chuna and Herb-med (some cases) | Classified into four groups (excellent, good, fair and poor) by change of symptoms, ROM, physical examination | Excellent, 11.8%; good, 52.9%; fair, 20.6%; poor, 14.7% | N/A |
| Lee and Lee (16) | Neck pain | 25 | CA, EA (1–25 Hz, constant or intermittent) | 20–30 min various times | Herb-med, chuna (10 min, 4/1 week) and cupping therapy, EST, TENS, micro wave, hot pack, C-traction, etc. | Classified into four groups (excellent, good, fair and poor) by change of symptoms, ROM, physical examination | Excellent, 16%; good, 44%; fair, 24%; failure, 16% | N/A |
| Lee et al. (15) | Cervical pain | 50 | CA | 20–30 min various times | Herb-med, negative (1/1 day), chuna (10 person, 2–3/1 week) | Classified into four groups (excellent, good, fair and failure) by changes of symptoms, ROM and physical examination | Excellent, 6%; good, 32%; fair, 56%; failure, 6% | N/A |
| Choi et al. (14) | Cervical pain (by traffic accident) | 52 | CA | Not stated | Herb-med, Oriental Phy-Tx (hot pack, TENS, SSP, Negative, US, traction, etc.), chuna, C–H pas (some cases) | Classified into five groups (excellent, improved, mild improved and failure) by changes of symptoms and ROM | Excellent, 17.31%; improved, 40.38%; mild improved, 32.69%; failure, 9.62% | N/A |
| Lee et al. (17) | HNP of C-spine | 50 | CA (0.25 × 30 mm), depletion of blood | 28 min daily various times | Cervical traction, cervical collar, etc. | Classified into four groups (excellent, good, fair and poor) by criteria of Martin A.N. | Excellent, 70%; good, 20%; fair, 6%; poor, 4% | N/A |
| Kim and Lee (13) | Neck pain | 72 32 40 | CA (0.25 × 40 mm) Same | 15 min 1/2 days 6 times Same | Chuna (various methods, 1/2 days, 6 times) None | Measure VAS, ROM | Group treated by acupuncture with chuna was better than group treated by only acupuncture in the degree of improvement in pain and ROM | P < 0.001 |

ROM, range of motion; Phy-Tx, physical therapy; TENS, transcutaneous electrical nerve stimulation; EST, electrical stimulation therapy; HNP, herniated nucleus pulposus; SSP, silver spike point; LBP, Low back pain; IFC, interferential current; FES, functional electrical stimulation.
Cho and Kim (50) compared the acupuncture with electric acupuncture for HIVD patients using DITI. Hur et al. (51) investigated changes in the clinical symptoms of patients with spondylolisthesis after acupuncture treatment and evaluated alterations in DITI. A clinical study also reported a relationship between cigarette smoking and the result of Oriental medical treatment for lower back pain (52). Heo and co-workers studied the treatment of lower back pain and sciatica and found some correlation in the rate of alleviation with alterations in Moire topography (53,54) (Table 5).

Knee Joint Pain

It was reported that acupuncture was useful for the treatment of degenerative arthritis of knee joints (55–57). Woo et al. (58) evaluated the clinical effect of acupuncture on microtraumatic injuries of the knee joint. Kim and Lee compared acupuncture with BVA for osteoarthritis (59,60). Hwang et al. (61) measured the change of C-reactive protein (CRP), erythrocyte sedimentation rate (ESR) and rheumatoid arthritis (RA) factor, and the satisfactory assessment after BVA treatment in RA patients. Hwang (62) treated RA patients with herbal acupuncture (HA) and evaluated CRP, ESR, RA factor and immunoglobulin G and M (Table 6).

Other Painful Diseases

Electrical acupuncture stimulation was very useful to relieve pain that had not responded to various conventional medications including nerve blocks, neurosurgical intervention and neuropolitics (63). Cho et al. (64) compared acupuncture treatment and analgesics in postthoracotomy pain control. It was reported that venesection, a therapeutic method of sucking out non-physiological blood, alleviated pain induced by blood circulation dysfunction (65). Kim et al. (66) compared acupuncture treatment with trigger point treatment in ankle sprain patients. Bang et al. (67) carried out a clinical study on patients with humeral lateral epicondylitis or tennis elbow. Seung and Ahn (68) investigated the effect of moxibustion on the immune activity in the treatment of patients. Acupuncture treatment was very beneficial for acute gout (69). It was also demonstrated that acupuncture at acupoints on the non-injured side were as effective as acupuncture at acupoints on the injured side in ankle sprain patients (70) (Table 7) (Fig. 2).

Acupuncture for Stroke

Stroke

Ha et al. (71) reported a clinical study of acupuncture and scalp acupuncture on stroke patients (29 cases). Lee et al. (72) evaluated the change of blood pressure and body temperature of the stroke patients after venesection at Sybsun points, 10 acupoints located at the tips of all fingers and demonstrated that venesection at Sybsun points could alleviate hypertension in stroke patients. Park et al. (73) examined electrical stimulation at GV26 and CV24 on blood pressure, heart rate and cerebral

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**Table 4. Acupuncture for shoulder pain**

| Author name(s) | Condition treated | Number of points | Type of acupuncture | Length and number of Tx | Other treatments | Assessment | Results of acupuncture therapy | Statistical analysis |
|----------------|-------------------|------------------|---------------------|-----------------------|------------------|-----------|-------------------------------|---------------------|
| Park and Lee (18) | Frozen shoulder | 43 | CA (0.35 x 40 mm), EA (0.2 Hz, continuous), direct moxibustion | 20–30 min, 1–3/y, various times | Herb-med, ICT, US, hot pack | Classified into four groups (excellent, good, fair and poor) by changes of symptoms and Apley scratch test | Excellent, 16.3%; good, 34.8%; fair, 18.6%; failure, 30.2% | N/A |
| Cho and Lee (19) | Frozen shoulder | 23 | CA (0.25 x 30 mm), indirect moxibustion, fire needle | 20–30 min, daily, various times | Herb-med, ICT, US, hot pack | Classified into four groups (excellent, good, fair and poor) by changes of symptoms and DITI | DITI was valuable in the evaluation of therapeutic effect of acupuncture Tx | N/A |
blood flow (CBF) in ischemic stroke patients with transcranial doppler sonography. Ahn et al. (74) investigated change in 24 h blood pressure after auricular acupuncture treatment in stroke patients using an ambulatory blood pressure monitor. Kang et al. (75) compared acupuncture at ST36 and LI11 with stimulation at non-acupoints near these acupoints for the modulation of hypertension of acute stroke patients. Moon et al. (76) compared acupuncture at ipsilateral points with that at contralateral points on the cerebral blood flow (CBF) in ischemic stroke patients (Table 8).

Poststroke Diseases

Electric acupuncture could alleviate shoulder pain in cerebrovascular attack patients (77). It was demonstrated that BVA at LI15 and SI10 decreased visual analog scale of pain severity and increased painless passive range of motion of shoulder eternal rotation in hemiplegic shoulder pain patients (78). Kang and Baik (79) compared the therapeutic value of transcutaneous electrical nerve stimulation with interferential current therapy, infrared or hot pack treatments for shoulder pain in cerebrovascular attack patients. Lee and Lee (80) evaluated the effect of acupuncture and electric acupuncture on shoulder hand syndrome by using DITI. Kang et al. (81) examined the balanced bladder time and residual urine volume and demonstrated the clinical efficacy of moxibustion at CV3, CV4 and CV6 in patients with voiding dysfunction after a cerebrovascular accident (Table 9).

Acupuncture for Facial Palsy

Acupuncture treatment was beneficial in 72 cases of patients with facial paralysis (82). Moreover, electric acupuncture was better than needling in the treatment of patients with peripheral facial nerve paralysis (83). The effect of Hominis placenta acupuncture, a kind of HA, on Bell’s palsy was reported (84). It was demonstrated that Saam acupuncture at liver and stomach tonification points could treat peripheral facial palsy (85). Cho et al. observed the change of clinical symptoms and DITI, showing the benefits of acupuncture and herbal medicine in patients with Bell’s palsy (86,87).
| Author name(s) | Condition treated | Number of points | Type of acupuncture | Length and number of Tx | Other treatments | Assessment | Results of acupuncture therapy | Statistical analysis |
|---------------|-------------------|------------------|---------------------|-------------------------|------------------|------------|-------------------------------|---------------------|
| Kim and Choi (20) | HNP of L-spine | 20 | CA | 15 min 1/2 days various times | None | Classified into five groups (excellent, good, moderate, slight and not improved) by clinical evaluation | Excellent, 25%; good, 20%; moderate, 10%; slight, 20%; not improved, 25% | N/A |
| Kim and Chae (36) | LBP and sciatica | 96 | CA (0.25 × 40 mm) | 15 min 1/1–2 days various times | Negative, carbon, infrared, ICT, hot pack, traction, etc. (some cases) | Classified into four groups (excellent, good, fair and poor) by clinical evaluation | Excellent, 26%; good, 35.4%; fair, 28.1%; poor, 10.4% | N/A |
| Lee et al (42) | Stable thoracolumbar vertebral fracture | 20 | Acute stage | Depletion of blood (A-shi points, daily), afterward CA | Not stated | Herb-med, ICT, US, hot pack, Knight taylor kin support, Bohler exercise | Classified into four groups (excellent, good, fair and poor) by clinical evaluation | Excellent, 30%; good, 60%; fair, 5%; poor, 5% | N/A |
| Lee (48) | HNP of L-spine | 26 | CA | 20 min daily for 4 weeks | Herb-med | Classified into four groups (excellent, good, fair and poor) by changes of symptoms and DITI | Excellent, 23%; good, 73%; fair, 4%; poor, 0% | N/A |
| Han (46) | Degenerative lumbar stenosis | 37 | EA (0.3 × 50 mm), HA (nutrient ducts 0.1–0.2 ml), indirect moxibustion (5 piece) | 15–20 min 1/1–2 days various times | Herb-med, negative (daily) | Classified into four groups (excellent, good, fair and poor) by clinical evaluation | Excellent, 13.5%; good, 56.8%; fair, 8.1%; poor, 21.6% | N/A |
| Hur et al. (51) | Spondylolisthesis | 22 | CA (0.25 × 30 mm), indirect moxibustion (pain site), fire needle | 20–30 min daily various times | IFC, US, hot pack, etc. | Classified into four groups (excellent, good, fair and poor) by changes of symptoms and DITI | Excellent, 27.25%; good, 54.6%; fair, 13.65%; poor, 4.5% | N/A |
| Kim et al. (47) | Spondylolisthesis | 28 | CA (0.3 × 40 mm), EA (14 Hz constant), moxibustion | 15–20 min various times | Herb-med, infrared, hot pack, ICT, US, cupping therapy, etc. | Classified into four groups (excellent, good, fair and poor) by clinical evaluation | Excellent, 10.7%; good, 60.7%; fair, 25%; poor, 3.6% | N/A |
| Mun et al. (30) | HNP of L-spine | 16 | CA, indirect moxibustion (3 piece/1 day) | 30 min daily various times | Herb-med, cupping therapy (5 min), Western medicine | Measure herniation rate through f/u computed tomography after 5–7 years | The largest herniations were those that had the greatest tendency to decrease in size | N/A |
| Lim et al. (40) | Acute back pain | 34 | CA | 15–30 min 2/1 day various times | Whuallak-tang (over 7 days), cupping therapy, exercise | Classified into four groups (excellent, good, fair and poor) by clinical evaluation, measure AST, ALT, ALP | Excellent, 29.4%; good, 67.7%; fair, 2.9%; poor, 0% | N/A |
| Author name(s) | Condition treated | Number of points | Type of acupuncture | Length and number of Tx | Other treatments | Assessment | Results of acupuncture therapy | Statistical analysis |
|---------------|-------------------|------------------|--------------------|------------------------|------------------|------------|--------------------------------|---------------------|
| Jin et al. (37) | Scoliosis | 12 | CA | Not stated | Chuna (daily), Herb-med, ICT, US, etc. | Measure correction rate through Cobb’s angle (X-ray) | Symptoms [scoliosis angle], rotation degree, correction rate | N/A |
| Jang et al. (21) | HNP of L-spine | 30 | CA (0.3 × 40 mm and 0.4 × 80 mm) | 15–20 min daily various times | Herb-med, hot pack, ICT, EST, traction, cupping therapy, Chuna (cox), etc. | Classified into four groups (excellent, good, fair and poor) by changes of symptoms and DITI | Excellent, 20%; good, 43.3%; fair, 30%; poor, 6.66% | N/A |
| Park and Ahn (31) | HNP of L-spine | 44 | CA (0.3 × 40 mm), depletion of blood (A-shi points, 5–10 cc), EA (3.5–12 Hz, 9 V, 15 min) | 15 min daily various times | TENS, infrared, traction, hot pack | Classified into four groups (excellent, good, fair and poor) by clinical evaluation | EA group were more effective than CA group | N/A |
| Cho and Kam (50) | HNP of L-spine | 40 | CA (0.3 × 40 mm), EA (3.5–12 Hz at 9 V for 15 min) | 25 min daily various times | Herb-med, IFC, US, cupping therapy, hot or ice pack | Classified into four groups (excellent, good, fair and poor) by changes of symptoms and DITI | EA group were more effective than CA group | N/A |
| Park and Lee (32) | LBP and sciatica | 21 | Dong-si acupuncture Tx (0.3 × 40 mm for 20–30 min), CA (0.3 × 40 mm for 40–80 min), EA (2.3–3.6 Hz at 2–6 V) | 15–25 min daily various times | Herb-med, hot pack, cupping therapy, ICT, EST, traction, etc. | Classified into four groups (excellent, good, fair and poor) by changes of symptoms and physical examination | Dong-si acupuncture (+CA +EA) group were more effective than CA (+EA) group | N/A |
| Lee and Hwang (33) | LBP and sciatica | 28 | Saam acupuncture Tx (0.3 × 40 mm, for 20–30 min), CA (0.3 × 40–80 mm), EA (2.3–3.6 Hz) | 15–25 min daily (each) various times | Hot pack, cupping therapy, ICT, EST, traction, Chuna, etc. | Classified into four groups (excellent, good, fair and poor) by changes of symptoms and physical examination | Saam acupuncture group (+CA +EA) were more effective than CA (+EA) group | N/A |
| Lee et al. (25) | HNP of L-spine | 60 | CA (0.25 × 30 mm) | 15–20 min daily various times | ICT, US, TENS, traction, hot or ice pack (some cases) Western medicine injection | Classified into four groups (excellent, good, fair and poor) by clinical evaluation | Group with Oriental-Western medicine were more effective than group with Oriental medicine | N/A |
| Study          | Condition | Participants | Description | Treatment | Outcome | Notes |
|---------------|-----------|--------------|-------------|-----------|---------|-------|
| Yoon et al. (34) | HNP of L-spine | 30 15 | CA (0.3 x 40-80 mm some points and A-shi point), EA (2.3–3.5 Hz) | 15–25 min daily (each) various times | Hot pack, cupping therapy, ICT, EST, traction, chuna, etc. | Classified into four groups (excellent, good, fair and poor) by changes of symptoms and physical examination | A-shi point group (+CA +EA) were more effective than CA (+EA) group |
| Chae et al. (35) | HNP of L-spine | 29 17 | CA | 2/1 day (first 5 days) 1/1 day (after 5 days) for 10 days | None | Measure VAS | Constitutional acupuncture group were more effective than CA group | $P < 0.05$ |
| Jeong et al. (52) | LBP | 40 28 | Smokers, CA (0.25 x 40 mm), EA | 20–25 min daily various times | Cupping therapy, Herb-med, hot pack, TENS, ICT, EST, FES | Classified into four groups (excellent, good, fair and poor) by changes of symptoms and physical examination | Smoking $\rightarrow$ effectiveness |
| Song et al. (45) | Thoracolumbar compression fracture | 50 25 | CA (0.3 x 30 mm Hua-Tuo-Jia-Ji-Xue acupuncture (45° oblique and some points) | 15–20 min daily various times | Cupping therapy, Herb-med, hot pack, ICT, TENS, lumbar belt | Classified into four groups (excellent, good, fair and poor) by changes of symptoms and physical examination | Hua-Tuo-Jia-Ji-Xue acupuncture group were more effective than CA group |
| Kim et al. (28) | LBP | 33 17 | MENS (0.25 x 40 mm, B24-B27, 640 µA, 3 Hz) | 15 min 1/3 days 6 times | Herb-med (4) | Measure VAS, ROM, ODI | MENS had an effect on relieving LBP | VAS ($P < 0.05$); ROM, N/S; ODI, N/S |
| Heo (38) | LBP | 29 21 | Discogenic: CA (not stated) Simple back: CA (not stated) | Not stated | Chuna (flexion-distraction technique, diversified technique), cupping therapy | Measure improvement rate by VAS and LBP assessment questionnaire | Both discogenic group and simple back pain group were improved by chuna Tx | N/S; $P < 0.05$ |

MENS, microcurrent electrical neuromuscular stimulation; ODI, Oswestry disability index; HA, herbal acupuncture; LBP, Low back pain; IFC, interferential current; FES, functional electrical stimulation.
Table 6. Acupuncture for knee joint pain

| Author name(s) | Condition treated | Number of points | Type of acupuncture | Length and number of Tx | Other treatments | Assessment | Results of acupuncture therapy | Statistical analysis |
|----------------|-------------------|------------------|---------------------|-------------------------|------------------|------------|--------------------------------|---------------------|
| Koh and Kang (56) | OA of knee joint | 50 | CA (0.25 × 40 mm), moxibustion | 15–20 min 1/1–2 days various times | Herb-med | Classified into three groups (excellent, good and no improvement) by clinical evaluation | Excellent, 28.2%; good, 46.2%; no improvement, 25.6% | N/A |
| Lee and Seong (55) | OA of knee joint | 40 | CA (10–30 mm) and fire needle, indirect moxibustion | 15 min daily various times | Drugs for external application, Herb-med, exercise | Classified into four groups (excellent, good, fair and poor) by Martin A.N. method | Excellent, 70%; good, 15%; fair, 10%; poor, 5% | N/A |
| Na and Ahn (57) | OA of knee joint | 47 | CA (0.3 × 30 mm), moxibustion | Not stated | Cupping therapy (A-shi points), Herb-med and hot pack, IPC, US, TDP | Classified into four groups (excellent, good, slight good and poor) by assessment of Tx (American Rheumatism Association) | Excellent, 12.8%; good, 48.9%; slight good, 27.7%; poor, 10.6% | N/A |
| Woo et al. (58) | Microtraumatic injuries of the knee joint | 15 | Dong-si acupuncture (0.3 × 30 mm, 0.25 × 15 mm) | 15–30 min 3/1 week for 3 weeks | Exercise (during acupuncture therapy) | Measure through scale of Cincinnati knee rating system | The mean number of before Tx was 60.6 and after was 66.5. A total of 66.6% of patients were improved | N/A |
| Wang et al. (59) | OA of knee joint | 70 | BV (4000:1, 0.1–0.2 ml/1 acupuncture point) | 1–2/1 week various times | None | Classified into five groups (excellent, good, poor and bad) by knee joint evaluation scale (Lysholm and Karlsson) | BVT may play a role in the significant usefulness against OA patients | P < 0.05 |
| Kim and Lee (60) | OA of knee joint | 60 | BV (5000:1) | 2/1 week 15 times various times | None | Classified into four groups (excellent, good and poor) by changes of symptoms and DITI | BVT group were more effective than CA group | P < 0.01 |
| Hwang (62) | RA | 18 | HA (0.1 cc/1 acupuncture point), moxibustion | 1/2–3 days various times | Cupping therapy (1/2–3 days) | Classified into four groups (excellent, good, moderate, poor) by criteria of American Rheumatism Association | Excellent, 6%; good, 6%; moderate, 3%; poor, 3 | N/A |
| Hwang et al. (61) | RA | 15 | BV (0.1–0.2 cc/1 acupuncture point) | 2/1 week various times | None | Measure CRP, ESR, RA factor, improvement index and classified into four groups (excellent, moderate and poor) by clinical evaluation | Excellent, 40%; good, 46.70%; moderate, 13.30%; poor, 0% | N/A |

BV, bee venom; BVT, bee venom therapy; RA, rheumatoid arthritis; CRP, C-reactive protein; ESR, erythrocyte sedimentation rate; OA, Osteoarthritis; TDP, Ten ding Diancibo Pu.
Table 7. Acupuncture for other painful diseases

| Author name(s) | Condition treated | Number of points | Type of acupuncture | Length and number of Tx | Other treatments | Assessment | Results of acupuncture therapy | Statistical analysis |
|----------------|-------------------|------------------|---------------------|-------------------------|------------------|------------|--------------------------------|---------------------|
| Choi and Lee (69) | Acute gout | 21 | CA (0.2 × 30 mm) | 15 min daily various times | None | Classified into four groups (excellent, good, slight and unchanged) by clinical evaluation | Excellent, 75%; good, 25%; slight, 0%; unchanged, 0% | N/A |
| Bang et al. (67) | Tennis elbow | 36 | CA (0.3 × 50 mm), moxibustion (A-shi points, 3 piece/1 week) | 15 min 1/1–3 days various times | US, TENS, fixation (elastic band) | Classified into four groups (excellent, good, fair and poor) by clinical evaluation | Excellent, 14.1%; good, 52.8%; fair, 21%; poor, 10.5% | N/A |
| Seung and Ahn (68) | Arthritis | 65 | Direct moxibustion | 1/2 days 3 times | None | The immune activities of cell (LTT, E-RFC) and immune activity of liquid (IgG, IgA, IgM, C5) were observed. | The moxibustion showed good effect on the immune activity in the human body | Various P-values |
| Multineuritis | 22 | Indirect moxibustion (with cutting slice of fresh ginger or garlic bulb) | 2/1 week | Not stated | Not stated | Classified into four groups (excellent, good, unchanged and bad) by clinical evaluation | Excellent, 20.12%; good, 61.49%; unchanged, 17.24%; bad, 1.15% | N/A |
| Choi and Moon (65) | Pain (various) | 174 | Depletion of blood (three-edged needle, vacuum extractor, A-shi points, totally 5–20 ml) | Not stated | Not stated | Classified into four groups (excellent, good, unchanged and bad) by clinical evaluation | Excellent, 20.12%; good, 61.49%; unchanged, 17.24%; bad, 1.15% | N/A |
| Shim et al. (63) | Pain | 210 | EA (0.2 × 50 mm, 0.3 × 65 mm, 12 REPP by using Neuro R-70, 3–10 Hz, 50–150 pp low frequency, etc.) | 15–30 min 1–3/day 10 times | Not stated | Classified into four groups (marked improvement, improve, transient improvement, fail) by changes of investigation degree using Neuro R-70 | Marked improvement, 43.3%; improve, 41.4%; transient improvement, 13.8%; fail, 1.5% | N/A |
| Kim et al. (66) | Ankle sprain | 26 | CA (0.3 × 40 mm) | 20–30 min various times | Ice and hot pack, infrared | Classified into four groups (excellent, good, fair and poor) by clinical evaluation | Trigger point Tx group is more effective than CA group | N/A |
| Cho et al. (64) | Postthoracotomy pain | 20 | CA (0.25 × 30 mm), intradermal needle (1/2 days) | 20–30 min | Analgesic requirements | Measure scoring system for postoperative pain and the number of analgesic requirement | The number of analgesic requirement was reduced in the acupuncture group | P < 0.05 |
| Ahn et al. (70) | Ankle sprain | 21 | CA (0.3 × 30 mm in the painful side) CA (0.3 × 30 mm in the normal side) | 5 min | None | Measure the amperage from 12 left and right Chong points | Between the control and the ankle sprain group, there were significant differences between the amperages. The acupuncture to acupuncture points in the painful side was not less effective than the acupuncture to acupuncture points | N/A |

REPP, reactive electro permeability point; EST, electrical stimulation therapy; HNP, herniated nucleus pulposus; SSP, silver spike point.
Kang et al. compared a group treated by Oriental-Western treatment with a group treated by Oriental medical therapy by evaluating House–Brackmeann grading system and made a detailed evaluation of facial symmetry of Pillsbury and Fisch (88,89). Kim et al. (89) compared a group treated by both acupuncture and herbal medicine with a group treated by acupuncture in patients of facial nerve paralysis and demonstrated that the symptoms were improved in both groups. Kwon et al. (90) compared a group treated by conventional Oriental medicine therapy with a group treated by conventional Oriental medicine therapy and indirect moxibustion at ST4 and ST8 in peripheral facial paralysis patients (Table 10).

**Acupuncture for Other Conditions**

**Eye Disease (Ophthalmopathy)**

Acupuncture and venesection were useful in treating 22 patients who suffered from acute infectious conjunctivitis (91). Kim and Chae (92) reported 32 patients with cataract or glaucoma who were treated by Oriental medicine and acupuncture. The therapeutic effect of acupuncture and moxibustion on the sight of near-sighted patients was also reported (93,94). Clinical studies were carried out to demonstrate the effect of Oriental medicine and acupuncture on amblyopia (95) (Table 11).

**Nose Disease (Rhinopathy)**

Acupuncture was effective in the treatment of allergic rhinitis in 30 patients (96). Nasal acupuncture therapy was investigated to treat the chronic paranasal sinusitis and nasal obstruction (97,98) (Table 12).

**Ear Disease (Otopathy)**

Clinical studies were carried out to investigate acupuncture, moxibustion and venesection for tinnitus (99,100). It was reported that acupuncture at TE5, GI41, TE6 SI5, GI38, KI2 and venesection improved symptoms of patients with otitis media with effusion (101) (Table 13).
### Table 8. Acupuncture for stroke

| Author name(s) | Condition treated | Number of points | Type of acupuncture | Length and number of Tx | Other treatments | Assessment | Results of acupuncture therapy | Statistical analysis |
|----------------|-------------------|------------------|---------------------|-------------------------|------------------|------------|--------------------------------|---------------------|
| Park et al. (73) | Ischemic stroke | 23 | EA (intermittent) | 15 min once | None | Measure BP, PR and CBF (by TCD) (before acupuncture, 5, 10 and 15 min after acupuncture) | EA at GV26-CV24 was effective on increasing BP, PR and CBF | $P < 0.05$ |
| Ahn et al. (74) | Stroke (hypertension) | 22 | AA | For 24 h | None | Measure BP (every 1–2 h) | AA was effective on decreasing BP | $P < 0.05$ |
| Moon et al. (76) | Ischemic stroke | 28 | EA (0.25 × 40 mm opposing needling 50 Hz intermittent) | 15 min once | None | Measure $V_m$, $V_s$, PI (3 times) by TCD | Opposing needling increased cerebral activity more than ipsilateral-needling ($V_s$) | $P < 0.05$ |
| Kang et al. (75) | Stroke (hypertension) | 30 | CA (0.25 × 30 mm twirling 5–10 s) | Not stated once | None | Check BP 13 times (5 min for 15 min, 15 min for 45 min, 30 min for 2 h) | Acupuncture Tx at LI11, ST36 was useful to control temporary hypertension with acute stroke (especially systolic BP, from 5 to 150 min interval after acupuncture Tx) | $P < 0.05$ |
| Lee et al. (72) | Stroke | 79 | HTN G: venesection (Sypsun-points 1–2 cc) | Once | None | Check BP and BT twice before acupuncture and 3 times after acupuncture Tx (every 30 min), undergo post hoc Scheffe index of GLM-repeated measured define factors | Venesection at Sypsun-points decreased BP (case of severe degree) | $P < 0.05$ |
| Ha et al. (71) | Stroke | 29 | CA (0.3 × 40 mm), scalp acupuncture (contralateral 10–15 min, twirling 1–3 min), moxibustion | 15–20 min daily various times | None | Classified into four groups (excellent, good, fair and poor) by clinical evaluation | CA and scalp acupuncture group showed almost same effect compared with CA group | N/S |

CBF, cerebral blood flow; TCD, transcranial doppler sonography; $V_m$, mean blood flow velocity; $V_s$, systolic blood flow velocity; PI, pulsatility index.
| Author name(s) | Condition treated | Number of points | Type of acupuncture | Length and number of Tx | Other Treatments | Assessment | Result of acupuncture therapy | Statistical analysis |
|----------------|-------------------|------------------|---------------------|-------------------------|------------------|------------|-------------------------------|---------------------|
| Song et al. (77) | Poststroke hemiplegic shoulder joint, subluxation and pain | 38 | EA (0.25 × 40 mm, 8 points: origin and insertion site of supraspinatus, infraspinatus, deltoideus, m. 4 Hz intermittent), CA and moxibustion | 15 min daily for 4 weeks | Shoulder exercise (15 min, 3/1 day), physical therapy | Measure ROM, VD and JD by X-ray, undergo muscle power evaluation (by AMA) | EA was effective on treating shoulder joint, subluxation and pain after stroke | ROM, P < 0.001; VD, P < 0.05; JD, P < 0.01 |
| Lee and Lee (80) | Shoulder hand synd. after stroke | 23/11 | EA (0.25 × 40 mm at 5 Hz mixed) CA (0.25 × 40 mm) | 20 min daily for 3 weeks | None | Measure DITI, ROM | EA group were more improved on the temperature difference of both dorsal hands than CA group | P < 0.01 |
| Kang and Baik (79) | Poststroke shoulder pain | 120/90/30 | CA | Not stated | Hot pack (20 min daily for 2 weeks), Herb-med ICT (100 Hz constant, 15 min, daily for 2 weeks), Herb-med TENS (250 Hz, 15 min daily for 2 weeks) | Measure DITI and ROM | ICT and TENS group were effective on treatment of poststroke shoulder pain | P < 0.05 |
| Yin et al. (78) | Poststroke hemiplegic shoulder pain | 24/15 | BVT (1:10 000, 0.2 cc/1 acupuncture point 3/week), CA | Daily (CA) for 4 weeks | Herb-med, exercise, FES | Measure VAS, PROM, Fugl–Meyer motor assessment, modified Ashworth scale | BVT group was effective than control group on VAS, PROM | P < 0.05 |
| Kang et al. (81) | Poststroke voiding dysfunction | 20/10 | Indirect moxibustion (5 piece), CA | Daily | Herb-med, physical therapy etc | Evaluate balanced bladder time and residual urine volume | Moxibustion was effective on poststroke, voiding dysfunction | N/S |

VD, vertical distance; JD, joint distance; AMA, American Medical Association; PROM, painless passive ROM of shoulder external rotation.
| Author name(s)        | Condition treated       | Number of points | Type of acupuncture | Length and number of Tx | Other treatments                          | Assessment            | Results of acupuncture therapy | Statistical analysis |
|----------------------|-------------------------|------------------|---------------------|-------------------------|------------------------------------------|-----------------------|---------------------------------|----------------------|
| Lee and Lee (82)     | Peripheral facial paralysis | 72               | CA (0.35 × 30 mm), Dong-shi acupuncture, EA, fire needle | 20 min various times | Herb-med, SSP, carbon (20 min), EST (20 min at 3.5 Hz), infrared (20 min 3-4/1 day) | Classified into four groups (excellent, good, fair and poor) by clinical evaluation | Excellent, 55.56%; good, 19.44%; fair, 20.83%; poor, 4.16% | N/A                  |
| Lee (85)             | Peripheral facial paralysis | 85               | CA (0.25 × 30 mm), EA (1–3 Hz for 15 min) | 15–20 min 1/2–3 days various times | Infrared, Western medicine (steroid) | Classified into four groups (excellent, good, fair-poor and trace-zero) by clinical evaluation | Excellent, 31.76%; good, 32.94%; fair-poor, 23.53%; trace-zero, 11.77% | N/A                  |
| Song et al. (87)     | Bell’s palsy             | 11               | CA (0.30 × 30 mm)   | 15–20 min various times | Infrared, TDP                        | Examine DITI (took picture ~7 days after the o/s, classified into six groups (normal, good, fair, poor, trace and zero) by the grading system of facial palsy | Excellent, 31.5%; good, 37%; fair, 13%; poor, 18.5% | N/S                  |
| Cho et al. (86)      | Bell’s palsy             | 16               | CA (0.25 × 30 mm), fire needle | 20–30 min various times | Herb-med, infrared, Carbon, TENS, hot pack, etc | Examine DITI (before and after Tx) and classified into four groups (excellent, good, fair and poor) by clinical evaluation | DITI shows therapeutic effect of acupuncture Tx | N/A                  |
| Lee and Han (83)     | Peripheral facial paralysis | 50               | EA (0.25 × 40 mm, loose and dense wave (till first week) CA (0.25 × 40 mm) | 15–20 min 3 Hz various times | Infrared, carbon (20 min), facial massage and exercise | Classified into five groups (normal, excellent, good, fair and poor) by clinical evaluation | EA had a better effect than CA | N/A                  |
| Kang et al. (88)     | Peripheral facial paralysis | 72               | CA (0.25 × 40 or 0.3 × 50 mm), EA (frequency 3 × 10 or 1 × 10 constant 15 min) | 20–30 min various times | Infrared, hot pack, facial massage (some cases) | Classified into four groups (excellent, good, fair and poor) by clinical evaluation | Excellent, 31.5%; good, 37%; fair, 13%; poor, 18.5% | N/A                  |
| Yun et al. (84)      | Bell’s palsy             | 16               | HA (Hominis placenta 0.1–0.2 cc for 3 days), CA (0.25 × 30 mm) | 15–20 min 1/1–2 days various times | Herb-med, SSP, microwave or TDP, ICT | Classified into four groups (excellent, good, fair and poor) by Muscle testing (Lucille Daniels) | Excellent, 7; good, 1 Excellent, 4; good, 2; fair, 0; poor, 0 | N/A                  |
It was reported that acupuncture and herbal medicine were effective in the treatment of acne in 125 patients (102). It was also found that acupuncture and herbal medicine improved the symptoms of the acne patients (103) (Table 14).

### Hypertension

Clinical studies with auricular acupuncture were performed on 23 patients with hypertension (104). Lee et al. (105) examined moxibustion at LI11 and CV4 for blood pressure of hypertension patients (Table 15).

### Smoking and Drinking Cessation

Auricular acupuncture to stop smoking (106–110). Kim et al. (111,112) investigated the effect of auricular acupuncture on cessation of drinking in alcoholic patients. It was reported that auricular acupuncture and herbal medicine were effective for quitting drinking (113) (Table 16).

### Obesity

Electric acupuncture decreased body weight, abdominal length, size of waist and body mass index (114,115). Lee and Kim (116) compared auricular acupuncture combined with herbal acupuncture with auricular acupuncture and herbal medicine for the treating obesity by measuring body weight and percentage of body fat (Table 17).

### Nausea and Vomiting

Auricular acupuncture on sympathetic, stomach, shenmen and occiput points for postoperative nausea and vomiting in 100 female patients undergoing transabdominal hysterectomy. It was demonstrated that electric acupuncture at PC6 and PC7 was very effective in preventing nausea, retching and vomiting (117) (Table 18).

### Obstetrics and Gynecology

Electric stimulation at acupuncture points significantly shortened the delivery time and attenuated the pain during delivery (118). Moreover, endometrial curettage was successfully performed on 31 female patients under acupuncture anesthesia (120) (Table 19).

### Others

Moxibustion could have an effect on peripheral circulation (121). Ahn et al. (122) examined the temperature change of external genitalia in patients with impotence after herbal medicine and acupuncture treatment. Auricular acupuncture altered hormone and energy metabolism during weight control of athletes (123) (Table 20).

### Table 10. Continued

| Author name(s) | Condition treated | Number of points | Type of acupuncture | Length and number of Tx | Other treatments | Assessment | Results of acupuncture therapy | Statistical analysis |
|----------------|-------------------|------------------|---------------------|-------------------------|------------------|------------|-------------------------------|---------------------|
| Kwon et al. (90) | Peripheral facial paralysis | 30 | CA (0.30 × 30–50 mm), joined puncture, EA (some cases, frequency 3 × 10 or 1 × 10, 15 min) | 15–20 min 2–3/day various times | Indirect moxibustion (1–2/day), Herb-med, Western medicine infrared, hot pack, facial massage, etc | Classified into four groups (excellent, good, fair and poor) by clinical evaluation | Excellent, 21.4%; good, 50%; fair, 21.4%; poor, 7.2% | N/A |
| Kim et al. (89) | Peripheral facial paralysis | 46 | CA (0.25 × 40 mm 0.3 × 40 mm), EA (frequency 3 × 10 or 1 × 10), depletion of blood (some cases) | 15–20 min 1/1–3 days average 16.6 times | Herb-med, infrared, TDP, facial massage | Classified into four groups (excellent, good, fair and poor) by clinical evaluation | Excellent, 36%; good, 39%; fair, 19%; poor, 6% | N/A |
| Author name(s)        | Condition treated                  | Number of points | Type of acupuncture | Length and number of Tx | Other treatments | Assessment | Results of acupuncture therapy | Statistical analysis |
|-----------------------|-----------------------------------|------------------|---------------------|-------------------------|------------------|------------|--------------------------------|---------------------|
| Sim et al. (91)       | Acute infectious conjunctivitis    | 22               | Depletion of blood, afterward CA | 15 min various times   | None             | Classified into four groups (recovered, good, unchanged and aggravated) by clinical evaluation | Recovered, 20; good, 2 | N/A                  |
| Chae (94)             | Visual acuity                     | 74               | CA                  | Not stated average 2.25 times/week | Herb-med         | Not stated | Not stated                       | N/A                  |
| Kim and Chae (92)     | Glaucoma, Cataract, Causing-blindness-disease | 4(3)+, 5(0)+, 23(16)=32 | CA                  | Not stated             | Herb-med         | Intraocular pressure, clinical evaluation and a eye sight test | Clinical evaluation and a eye sight test | P < 0.05 |
| Choi et al. (93)      | Near sightedness                  | 25               | The stamp acupuncture, CA (0.25 × 30 mm), AA, moxibustion (2/month) | 20 min 3/week       | None             | Measure the improvement rate of eye sight in each cases of wearing glasses or not. Classified into four groups (good, fair, poor and fail) by the improvement degree of both eyes | Points not wearing glasses were more improved than points wearing glasses Good, 44%; fair, 40%; poor, 12%; fail, 4% | P < 0.05 |
| Kim et al. (95)       | Amblyopia                         | 18               | The stamp acupuncture, CA (0.25 × 30 mm), AA | 20 min 3/week for 3 months | Herb-med         | Measure the improvement rate of eye sight in each cases of wearing glasses or not and undergo an eye sight test (2/month 3 times) | Acupuncture was effective in improvement of eye sight. Improvement degree 0.2; 33%; 0.1-0.2, 50%; 0.1, 17% | P < 0.05 |
### Table 12. Acupuncture for nose disease (rhinopathy)

| Author name(s) | Condition treated | Number of points | Type of acupuncture | Length and number of Tx | Other treatments | Assessment | Results of acupuncture therapy | Statistical analysis |
|----------------|-------------------|------------------|---------------------|-------------------------|------------------|------------|--------------------------------|---------------------|
| Kim and Park (96) | Allergic rhinitis | 30 | CA, EA (2 Hz, intensity 2–3) | 20 min 2–3 week average 22.8 times | Herb-med | Clinical evaluation | Frequency of treatment improvement | N/A |
| Kim and Yoon (98) | Nasal obstruction | 32 | Nasal acupuncture (10 × 140 mm) | 15 min 2–3 week | Infrared | Classified into three grades by ant. rhinoscopy, afterward classified into four groups (excellent, good, unchanged and worse) by evaluated grades | Excellent, 31.3%; good, 53.1%; unchanged, 9.4%; worse, 6.2% | N/A |
| Seo and Lee (97) | Empyema | 19 | Nasal acupuncture (0.375 × 160 mm and oblique acupuncture into orifice of Sinus maxillaris) | 15 min daily average 11 times | Infrared | Classified into three groups (excellent, good and unchanged) by clinical evaluation, rhinoscopy and X-ray | Excellent, 4; good, 13; unchanged, 2 | N/A |

### Table 13. Acupuncture for ear disease (otopathy)

| Author name(s) | Condition treated | Number of points | Type of acupuncture | Length and number of Tx | Other treatments | Assessment | Results of acupuncture therapy | Statistical analysis |
|----------------|-------------------|------------------|---------------------|-------------------------|------------------|------------|--------------------------------|---------------------|
| Park et al. (99) | Tinnitus | 30 | CA | 1/2–3 days | Infra, cupping therapy, laser therapy, moxibustion, Herb-med | Score (0–7) by questionnaire, measure success rate and recovery rate | Success rate, 76.6%; recovery rate, 42.2% | N/A |
| Kim (100) | Tinnitus | 47 | CA | Not stated | Cupping therapy, moxibustion, Herb-med | Classified into four groups (complete recovered, significant, good and unchanged) by changes of symptom | Tinnitus included in other symptoms and accompanied by vertigo vertigo — treatment efficiency | N/A |
| Lee et al. (101) | Otitis media with effusion | 18 | Depletion of blood, CA (0.20 × 30 mm) | 15 min (stimulation 2 times) average 14.5 times | None | Classified into three groups (excellent, good and unchanged) by clinical evaluation and otoscopy | Excellence, 22.2%; good, 66.7%; unchanged, 11.1% | N/A |
Acupuncture stimulation significantly decreased electrical resistance under the diaphoresis, suggesting that the decrease of electrical resistance is caused not only by sweat secretion but also by other internal resistance (124). Youn et al. (125) reported a strong correlation between acupuncture at KI6 and cortical activation in the motor-related region of the human brain by using fMRI. Acupuncture at LI4 in the left hand increased regional CBF (rCBF) in the right parietal lobe, middle temporal gyrus and inferior occipital lobe, and electric acupuncture at ST36 on the right side increased rCBF in the left temporal lobe, the inferior frontal lobe and cerebellar hemisphere using single photon emission computed tomography (126,127). It was shown that acupuncture at LI4 and LV3 could ipsilaterally enlarge a blind spot map (128).

Several studies were performed to examine if acupuncture at LI4 changed skin temperature in the LI4 area of the hand, LI11 area of the arm, LI20 area of the face and ST25 area of the abdomen by using DITI (129–135). It was also examined to see whether the alteration of acupuncture manipulation method could change the temperature in these regions of the body (136,137). Other studies were performed to investigate the effects of acupuncture at LU9 by thermal change in the five shu points or LU9 and LU1 areas of lung meridian (138,139). Yook et al. (140) examined whether HA at BL12, BL13, BL41 and BL42 could affect local thermal change by using DITI. Kim et al. (141) examined whether acupuncture at the WuHu acupoint could affect thermal change in the ankle region (Table 21).

### Discussion

A large number of clinical studies have used acupuncture; electric acupuncture, moxibustion and other traditional therapies to target a relatively broad range of medical problems, primarily pain and stroke. Moreover, acupuncture has been widely used for treatment of facial palsy, obesity, hypertension, nausea and vomiting, and many other diseases. However, as mentioned in the beginning of this report, the studies had various weaknesses such as inadequate sample size, inappropriate control treatment, inadequate follow-up, inadequate control of non-specific effects, inadequate reporting of side effects and a few studies’ failure to replicate results. These concerns make it difficult to draw clear conclusions about efficacy in most areas where acupuncture has been tested.

A number of systematic reviews on acupuncture for specific conditions have recently been published, including an extensive systematic review on chronic pain, with a far reaching search strategy and a way of scoring trial methodology (142). Recently, the best evidence synthesis review showed that there was only limited evidence that acupuncture is more effective than no treatment (waiting list) and inconclusive evidence that acupuncture is more effective than inert placebo, sham acupuncture or standard medical care (143). In addition, the
### Table 15. Acupuncture for hypertension

| Author name(s)            | Condition treated | Number of points | Type of acupuncture | Length and number of Tx | Other treatments | Assessment                                                                 | Result of acupuncture therapy                                                                 | Statistical analysis |
|---------------------------|-------------------|------------------|---------------------|-------------------------|------------------|---------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|---------------------|
| Byun and Ahn (104)        | Hypertension      | 23               | AA                  | 2/1 week                | None             | Classified into five groups (recovered, good, moderate, slight and unchanged) by clinical evaluation | AA was effective on treating hypertension                                                          | N/A                 |
| Lee et al. (105)          | Hypertension      | 25               | Indirect moxibustion (3 piece) | 2/1 week 10 times       | None             | Measure BP 6 times (1/1 week)                                             | Constant moxibustion at LI11, CV4 showed decrease of BP                                         | P < 0.05            |

### Table 16. Acupuncture for smoking and drinking cessation

| Author name(s)            | Number of points | Type of acupuncture and acupuncture points | Length and number of Tx | Other treatments | Assessment                                                                 | Result of acupuncture therapy                                                                 | Statistical analysis |
|---------------------------|------------------|--------------------------------------------|-------------------------|------------------|---------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|---------------------|
| Lee et al. (110)          | 606              | CA (0.25 x 40 mm), afterward, AA (same points) | 15–20 min 2/week various times | None             | Classified into five groups (recovered, good, moderate, slight and unchanged) by clinical evaluation | Recovered, 40.5%; good, 26.7%; moderate, 19.5%; slight, 5.3%; unchanged, 8.1% | N/A                 |
| Ahn et al. (107)          | 107              | AA                                         | 2/week average 4.07 times | None             | if/u 1 year after Tx, classified into five groups (recovered, good, moderate, slight and unchanged) by clinical evaluation | Recovered, 22.4%; good, 5.6%; moderate, 19.6%; slight, 16.8%; unchanged, 35.5% | N/A                 |
| Hwang et al. (106)        | 203              | CA (0.3 x 30 mm), afterward, AA (same points) | 20 min 2/week various times | None             | Classified into five groups (recovered, good, moderate, slight and unchanged) by clinical evaluation | Recovered, 24%; good, 32%; moderate, 27%; slight, 5%; unchanged, 12% | N/A                 |
| Choi (109)                | 37               | AA, CA (contralateral side)                | 15 min 2/week average 2.95 times | None             | Classified into five groups (recovered, good, moderate, slight and unchanged) by clinical evaluation | Recovered, 43.2%; good, 24.3%; moderate, 10.2%; slight, 13.5%; unchanged, 2.7% | N/A                 |
| Choi and Hwang (108)      | 439, 249, 190    | AA, Sham AA                                | 2/week for 3 weeks/2week for 3 weeks | None             | Classified into five groups by clinical evaluation and compare            | Between exercise, control no significant difference, but AA: effective                          | N/A                 |
| Kim et al. (111)          | 233              | CA (0.25 x 40 mm), AA (same points, contralateral side) | 15–20 min 1/3–4 days various times | None             | Classified into five groups (recovered, good, moderate, slight and unchanged) by quit-drinking duration | The success rate, 74.7%; the recovered rate, 43.8%                                            | N/A                 |
| Park and Peun (113)       | 50               | CA, afterward AA (both sides, same points) | 20 min 2/week average 7.36 times | Herb-medic        | None                                                                      | None                                                                                           | N/A                 |
| Lee et al. (112)          | 133              | CA (same points, contralateral side)       | 15–20 min 2/week for 5 days | Herb-medic        | Classified into three groups (good, fair and no response) by clinical evaluation | Good, 52.7%; fair, 14.5%; no response, 32.8%                                               | N/A                 |
### Table 17. Acupuncture for obesity

| Author name(s)          | Number of points | Type of acupuncture and acupuncture points | Length and number of Tx | Other treatments | Assessment                                                                 | Result of acupuncture therapy | Statistical analysis |
|-------------------------|------------------|---------------------------------------------|-------------------------|------------------|----------------------------------------------------------------------------|-------------------------------|----------------------|
| Lee and Lee (114)       | 72               | EA (left and right eight acupuncture points located on the abdomen, horizontal method, 200–250 Hz) | 40 min average 8.60 times | None             | Classified into four groups (good, moderate, slight and unchanged) by changes of weight and circumference of abdomen | Good, 25%; moderate, 31.9%; slight, 31.9%; unchanged, 11.2% | N/A                  |
| Jeong et al. (115)      | 9                | CA (various), EA (not stated), AA (various) | Not stated average (EA) 12.9 times | Various (diet, exercise, etc.) | Measure weight, fat mass, percent body fat, fat distribution, relative body weight, BMI | Weight (kg), 5.66; fat mass (kg), 3.28; percent body fat (%), 2.83; fat distribution, 0.05; relative body weight (%), 10.4; BMI, 2.2; circumference of abdomen, 2.25 | N/A                  |

BMI, body mass index.

### Table 18. Acupuncture for nausea and vomiting

| Author name(s)          | Condition treated | Number of points | Type of acupuncture (exercise group) | Length and number of Tx (exercise group) | Other treatments | Assessment | Result of acupuncture therapy | Statistical analysis |
|-------------------------|-------------------|------------------|---------------------------------------|------------------------------------------|------------------|------------|-------------------------------|----------------------|
| Kim et al. (118)        | Postoperative nausea and vomiting | 100              | EA (0.25 × 40 mm PC6 PC7 twirling 3 Hz intensity till not feeling pain) | 15 min                     | Various Tx for op. | Check incidence of nausea, retching and vomiting blindly every 3 h after op. for 12 h | EA group showed better results for 12 h after op. (every 3 h) | P < 0.001            |
| Kim et al. (117)        | Postoperative nausea and vomiting | 100              | AA | Not stated | Various Tx for op. | Check incidence of nausea, retching and vomiting blindly every 3 h after op. for 12 h | AA group showed better results for 12 h after op. (every 3 h) | P < 0.01            |

Op., operation.
### Table 19. Acupuncture for obstetrics and gynecology

| Author name(s) | Condition treated                  | Number of points | Type of acupuncture and acupuncture points | Length and number of Tx | Other treatments | Assessment | Result of acupuncture therapy | Statistical analysis |
|----------------|------------------------------------|------------------|--------------------------------------------|-------------------------|------------------|------------|---------------------------------|---------------------|
| Kim and Kim (120) | Acupuncture anesthesia (curettage) | 31               | EA (0.25 × 40 mm 1–3.5 Hz adjust intensity) | During curettage        | None             | Classified into three groups (excellent, good and poor) by injection amount of pentothal sodium | Excellent, 22; good, 5; poor, 4 | N/A |
| Kim et al. (119)  | Labor in primipara                 | 39               | EA (1–3 Hz constant, adjust intensity)      | From active phase (first stage of labor) to phase of placental separation (third stage of labor) once | None             | The duration of labor of exercise group was shorter than that of control group | The duration of labor of exercise group was shorter than that of control group | $P < 0.05$ |

### Table 20. Acupuncture for other conditions

| Author name(s) | Condition treated                              | Number of points | Type of acupuncture and acupuncture points | Length and number of Tx | Other treatments | Assessment | Result of acupuncture therapy | Statistical analysis |
|----------------|-----------------------------------------------|------------------|--------------------------------------------|-------------------------|------------------|------------|---------------------------------|---------------------|
| Hwang and Yang (121) | Peripheral blood circulation disturbance | 20               | Indirect moxibustion (three piece)         | Once                    | None             | Measure peripheral blood circulation using assessing 22 grades | The indirect moxibustion (10-jong points) were useful for peripheral blood circulation | N/A |
| Ahn et al. (122)   | Impotence                                     | 12               | Saam acupuncture                           | Not stated 1/week for 2 months | Herb-med         | Measure the temperature using DITI | The thermo-difference of left thigh and glans penis, both scrotum increased significantly | $P < 0.05$ |
| You et al. (123)   | The change of hormone and energy metabolism during weight control of Taekwondo players | 20               | AA                                         | 1/3 days for 2 weeks    | None             | Analysis the level of $Na^+$, $K^+$, $Cl^-$, $Ca^{++}$, creatinine, cortisol, epinephrine and norepinephrine | AA was shown increase levels of $Na^+$, cortisol, epinephrine, decrease levels of leptin that products of ob-gene | $P < 0.05$ (Na+, cortisol, epinephrine) $P < 0.01$ (leptin) |

N/A = Not applicable
Table 21. Acupuncture for human study

| Author name(s) | Number of points | Type of acupuncture and acupuncture points | Length and number of Tx | Assessment points | Measure moments | Result of acupuncture therapy | Statistical analysis |
|----------------|------------------|--------------------------------------------|-------------------------|-------------------|----------------|-----------------------------|---------------------|
| Lee et al. (129) | 15 | CA (0.25 × 40 mm right LI4 twirling 7–8 times) | 30 min | LI4, LI11 | Before acupuncture stimulation, 30 s, 1 min, 10 min, 30 min after acupuncture stimulation and 10 min after needle-removal | DITI is a useful method to observe and f/u the effects and the changes by acupuncture stimulation for objective evaluation | N/A |
| Han et al. (131) | 54 | CA (0.3 × 30 mm left LI4) | 15 min | LI20 | Before acupuncture stimulation, 5, 10 and 15 min after acupuncture stimulation | Acupuncture can modulate the equilibrium of Um-Yang and Keo-ja theory | Various P-values |
| Sohn et al. (130) | 95 | CA (0.25 × 30 mm both or right LI4) | 10 min | LI4, ST25 | Before acupuncture stimulation, and 1, 10 min after acupuncture stimulation | Acupuncture on LI4 affects to thermal changes of LI4 and ST25 | Various P-values |
| Song et al. (132) | 42 | CA (0.25 × 30 mm right LI4) | 10 min | LI11, LI20 | Before acupuncture stimulation, and 1, 10 min after acupuncture stimulation | Acupuncture on LI4 affects to thermal changes of LI11 and LI20 | Various P-value |
| Song et al. (137) | 60 | CA (0.3 × 30 mm left LI4 left) | 10 min | LI1-5 | Before acupuncture stimulation, and 10 min after acupuncture stimulation | One point with the left or right rotary acupuncture stress effects the other points which have relation with it | Various P-values |
| Hwang et al. (134) | 100 | CA (0.3 × 30 mm left LI4) | 10 min | LI4, ST25, CV12 | Before acupuncture stimulation, and 5, 10 min after acupuncture stimulation | Acupuncture on LI4 affects to thermal changes of ST25 and CV12 (abdominal surface) | Various P-values |
| Yun et al. (135) | 30 | None | None | None | | | Various P-values |
| Kim et al. (139) | 60 | CA (0.3 × 30 mm L9) | 10 min | LI9, PT7, LU1, CV22 | Before acupuncture stimulation, and 10 min after acupuncture stimulation | The acupuncture stimulation on L9 affected the thermal change of the area that is a meridian point, in lung meridian | Various P-values |

**Note:** EA (0.3 × 30 mm right LI4 LI3 2 Hz Hi-CONT.), EA (0.3 × 30 mm right H7 H5 2 Hz Hi-CONT.)
| Author name(s) | Number of points | Type of acupuncture and acupuncture points | Length and number of Tx | Assessment points | Measure moments | Result of acupuncture therapy | Statistical analysis |
|---------------|------------------|-------------------------------------------|------------------------|-------------------|----------------|--------------------------------|-------------------|
| Yook et al. (140) | 23 | N/S (0.05 cc/1 acupuncture point) | None | BL12 BL13 BL41 BL42 | Before HA, and 1, 24, 48 h, 7 days after HA | HA fluid has different effects on the dermatothermal change following times. BU group is latest in duration of physical reaction | Various P-values |
| Song and Yook (138) | 60 | CA (0.3 × 30 mm left L9) | 10 min | LU8-LU11, LU5 (five shu points) | The acupuncture on L9 affected the thermal change of the area that was the five shu points in the lung meridian | Various P-values |
| Kim et al. (141) | 45 | Dong-shi acupuncture (0.3 × 40 mm Wu-Hu) | 10 min | BL60 BL62 GB40 ST41 | The acupuncture on the Wu-Hu was effective at the ankle region | Various P-values |
| Park (124) | 15 | CA (0.25 × 40 mm Lt. P8) | 12 min | Measure the electrical resistance of anesthetized left P6, anesthetized non-acupuncture point, normal left P4 and normal right P6 | When the acupuncture stimulation is applied to human body, the decrease of electrical resistance is not only to sweat secretion but also to other internal resistance | P < 0.01 (dry electrode) P < 0.05 (wet electrode) |
| Youn et al. (125) | 5 | CA (KI6) | (Twist for 70 s and rest for 70 s) × 3 | Examine BOLD response by fMRI | Acupuncture at KI6 resulted in negative BOLD response to stimulation | Not stated |
| Kim et al. (126) | 11 | EA (0.3 × 40 mm ST36 2 Hz constant) | 20 min | Measure rCBF by rest/EA Tc-99m ECD brain SPECT using a same-dose subtraction method | EA at ST36 increased rCBF in the contralateral cerebral hemisphere | P < 0.9 |
| Oh et al. (127) | 11 | CA (0.3 × 40 mm left LI4) | 15 min | Measure rCBF by rest/EA Tc-99m ECD brain SPECT using a same-dose subtraction method | Acupuncture at left LI4 increased rCBF in the right hemisphere (the right parietal lobe, a part of the right middle posttemporal gyrus and the right inferior occipital lobe) | P < 0.9 |
| Woo and Nam (128) | 20 | CA (right LI4 LR3) | 20 min | Measure changes in blind spot mapping (manual perimetry) | Acupuncture ipsilateral side → blind spot map, contralateral cortical activity | N/A |

BOLD, blood oxygen level dependent; rCBF, regional cerebral blood flow; SPECT, single photon emission computed tomography; BU, Calculus Bovis, Fel Ursi; ECD, ethyl cysteinate dimer.
evidence of rigorous randomized controlled trials showed that there was no compelling evidence to show that acupuncture is effective in stroke rehabilitation (144). Yet, as clinicians who treat patients with acupuncture, we have success in these treatments where no efficacy is found. This is due to a complex set of problems at the heart of which is the establishment of a standard for the treatment of the control group. This article is not a systematic review; rather it is an overview of the clinical trials, presented in the hopes of introducing overall information about clinical studies in Korea to the English-speaking world.

This review describes a number of clinical studies that were performed to compare the therapeutic effects of different kinds of acupuncture under certain conditions. Conventional acupuncture was compared with electric acupuncture, auricular acupuncture, BVA and manipulation. These comparative studies of different kinds of acupuncture are required in order to proceed with the most adequate method in the future. Since more than two therapies were simultaneously performed to treat the disorders in some studies, it is not likely to demonstrate the efficacy of pure acupuncture apart from other treatments. For instance, given that both acupuncture and auricular acupuncture were effective to treat tension-type headache patients, it is impossible to clarify the extent of the therapeutic benefit of acupuncture. Therefore, in order to investigate the therapeutic benefits of acupuncture, it is necessary to establish a group treated by acupuncture alone.

From the above clinical studies, it is possible to summarize the originality of Korean acupuncture by describing both of its characteristic approaches—individualized and practical. Firstly, a number of clinical studies in Korea have shown the benefits of individualized acupuncture treatment, such as Saam, Taeguek or Eight constitutions acupuncture (35). Patel et al. (145) noted that individualized treatments significantly favored acupuncture, whereas formulaic approaches, in which all the patients received the same treatment, showed no significant difference. However, in order to demonstrate its superiority, more rigorous and well-designed randomized controlled clinical trials are urgently needed. Secondly, HA-like BVA have been used to treat a variety of painful conditions. HA is a new method of acupuncture where distilled herbal decoction is extracted and purified to be administered to an acupuncture point for stimulation. HA simultaneously exerts pharmacological actions from a bioactive compound isolated from herbal medicine and mechanical actions from acupuncture stimulation. The Korean medical world considers HA as a promising therapeutic method for various diseases (84,140).

An individualized approach based on constitutional energy traits have been widely applied to a number of clinical trials in Korean medicine. HA have also been developed as a new therapeutic modality using integrated and practical approaches. Korean acupuncture in its own way is making a contribution to the emerging need for individualized and integrated approaches to acupuncture. In closing, we stress the need for randomized controlled studies and express our hope that this view into Korean traditional medical practice will lead to evidence-based studies that could form the basis for a meta-analysis in the near future.

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