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The Status and Future of Acupuncture Clinical Research

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Abstract

On November 8–9, 2007, the Society for Acupuncture Research (SAR) hosted an international conference to mark the tenth anniversary of the landmark National Institutes of Health Consensus Development Conference on Acupuncture. More than 300 acupuncture researchers, practitioners, students, funding agency personnel, and health policy analysts from 20 countries attended the SAR meeting held at the University of Maryland School of Medicine, Baltimore, MD. This paper summarizes important invited lectures in the area of clinical research. Specifically, included are: a review of the recently conducted German trials and observational studies on low-back pain (LBP), gonarthrosis, migraine, and tension-type headache (the Acupuncture Research Trials and the German Acupuncture Trials, plus observational studies); a systematic review of acupuncture treatment for knee osteoarthritis (OA); and an overview of acupuncture trials in neurologic conditions, LBP, women's health, psychiatric disorders, and functional bowel disorders. A summary of the use of acupuncture in cancer care is also provided. Researchers involved in the German trials concluded that acupuncture is effective for treating chronic pain, but the correct selection of acupuncture points seems to play a limited role; no conclusions could be drawn about the placebo aspect of acupuncture, due to the design of the studies. Overall, when compared to sham, acupuncture did not show a benefit in treating knee OA or LBP, but acupuncture was better than a wait-list control and standard of care, respectively. In women's health, acupuncture has been found to be beneficial for patients with premenstrual syndrome, dysmenorrhea, several pregnancy-related conditions, and nausea in females who have cancers. Evidence on moxibustion for breech presentation, induction of labor, and reduction of menopausal symptoms is still inconclusive. In mental health, evidence for acupuncture's efficacy in treating neurologic and functional bowel disorder is still inconclusive. For chronic cancer-related problems such as pain, acupuncture may work well in stand-alone clinics; however, for acute or treatment-related symptoms, integration of acupuncture care into a busy and complex clinical environment is unlikely, unless compelling evidence of a considerable patient benefit can be established.

Introduction

On November 8–9, 2007, the Society for Acupuncture Research (SAR) hosted an international conference to mark the tenth anniversary of the landmark National Institutes of Health (NIH) Consensus Development Conference on Acupuncture. This paper summarizes important invited lectures from the SAR conference in the area of clinical acupuncture research. Two companion manuscripts have been written in parallel and appear in the current issue. One covers basic research (Napadow et al., 2008; pp. 861–869) and the other presents overviews of qualitative studies, the

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impact of the 1997 NIH consensus conference, and future directions in acupuncture research (MacPherson et al., 2008; pp. 883–887). In this paper, individuals who delivered lectures on clinical acupuncture research and have provided the summaries have been listed as coauthors of this paper.

The clinical research presenter-authored summaries include a general background for the acupuncture research trials on low-back pain (LBP), osteoarthritis (OA) of the knee, migraine (MIG), and tension-type headache (TTH) conducted in Germany. Linde and Molsberger summarize the Acupuncture Research Trials (ART) and the German Acupuncture Randomised Trials (GERAC), and provide an overview of the Acupuncture in Routine Care pragmatic and observational studies (ARC). Manhaeimer provides a systematic review of acupuncture in knee OA trials, while Park provides an overview of research studies of acupuncture in neurologic conditions, including Bell's palsy, spinal-cord injury, spasticity, whiplash, and trigeminal neuralgia. Acupuncture research in the treatment of mental health disorders, including depression, anxiety, and substance abuse, is provided by Schnyer. Sherman reviews research on acupuncture for LBP and Smith provides an overview of acupuncture in the treatment of women's health complaints, including common menstrual disorders, menopausal symptoms, and pregnancy-related issues. Sung presents a review of acupuncture in the treatment of functional bowel disorders, while Vickers summarizes the use of acupuncture in the care of patients who have cancer.

The German Acupuncture Research Programs: The ART and GERAC Trials (Linde and Molsberger)

In Germany, through the 1990s, treatment with acupuncture was often reimbursed informally by statutory sickness funds (which cover about 90% of the population). Under increasing pressure to budget health care costs, the German Federal Committee of Physicians and Statutory Sickness Funds decided in October 2000 that the scientific evidence supporting acupuncture was insufficient to justify routine reimbursement. However, the reimbursement of acupuncture treatment for a limited period of time was provided for a group of disorders for which the evidence was considered promising, on the condition that effectiveness would be evaluated. In total, three reimbursement and research programs including randomized trials and large-scale observational studies were performed between 2001 and 2006. Below, we briefly describe the two sets of sham-controlled trials included in these programs, the ART and the GERAC. These trials were funded by different state insurance companies to evaluate the effectiveness of acupuncture in the treatment of LBP, gonarthrosis (GON), MIG, and TTH. GERAC and ART each had four, three-armed randomized control trials (one for each condition),* with a follow-up of at least 6 months and various observational outcome studies. The main difference between the GERAC and ART trials was that the former tested verum and sham acupuncture (SA) against guideline-oriented standard therapy and the ART trials tested verum and sham against a wait-list control group.

*With exception of the TTH GERAC trial, which, in the end, was not a three-arm trial.

The Acupuncture Research Trials (ART)

The ART trials were coordinated by two centers at the Technical University, Munich, Germany, and Charité University Medical Center, Berlin, Germany, and performed at more than 70 sites in different parts of Germany. The main results of these trials have been published in major journals[1–4]; details of the protocols and the treatments actually provided were published in complementary and alternative medicine (CAM) research journals.[5–10] Participating physicians had to have at least 140 hours of acupuncture training. About 70% had 350 hours of training or more. Of 2200 patients screened, 1164 were included in the four trials and were randomized to one of three regimens: (1) 12 sessions of semistandardized (basic points in all patients plus additional individualized points) acupuncture within 8 weeks; (2) standardized minimal acupuncture (superficial needling at nonacupuncture points); or (3) a no-treatment wait-list control group. Main outcome measures were pain intensity on a visual analogue scale at 8 weeks (LBP), the Western Ontario and MacMaster University Osteoarthritis (WOMAC) index at 8 weeks (GON), the number of headache days with at least moderate intensity in weeks 9–12 (MIG), and the number of headache days in weeks 9–12 (TTH). In all four trials, patients receiving acupuncture improved in a statistically significant and clinically relevant manner compared to no treatment, but only in the knee OA trial was a significant effect over minimal acupuncture observed after completion of treatment. In the LBP trial, patients who received acupuncture improved by 28.7 mm, those who received SA by 23.6 mm, and those in the wait-list group improved by 6.9 mm.[1] In the GON trial, the baseline-adjusted WOMAC index for each was 26.9, 35.8, and 49.6 points, respectively (higher WOMAC scores indicate worse symptoms).[2] In the MIG trial, the numbers of days with moderate or severe headache decreased by 2.2 days in the acupuncture group, 2.2 days in the SA group, and 0.8 days in the wait-list group.[3] In the TTH trial, the number of headache days decreased by 7.2, 6.6, and 1.5 days, respectively.[4] During follow-up, differences between acupuncture and SA in the GON trial were no longer significant, while in the other trials, results were similar to those after completion of treatment.

The German Acupuncture trials (GERAC)

Under the guidance of the steering committee at the Ruhr-University of Bochum, Germany, four trial centers were founded in four different German universities, with each being responsible for one of the four GERAC trials: LBP, GON, MIG, and TTH, respectively. Five hundred and fifty (550) office-based physicians spread out all over Germany, with at least 140 hours of acupuncture training and 2 years of acupuncture experience, were selected to take part in the GERAC trials. Prior to the trials, all physicians had to attend training on the specific intervention and documentation modalities of GERAC. After having screened approximately 5400 patients, 3574 were included in the four trials and randomly allocated to one of three regimens: (I) verum acupuncture according to Traditional Chinese Medicine (TCM) point selection; (II) a newly designed SA with superficial needle insertion in non–Chinese acupuncture points (sham or minimal acupuncture); or (III) a standard therapy group delivering guideline-oriented pharmacologic and physical stan-

dard medical care. Mandatory and optional verum and sham points were predefined, and the point selection was individualized according to the criteria of TCM. Patients were blinded to the type of acupuncture received. While the acupuncture treatment consisted of 10–15 treatments (mean number of treatments was 11) within 6 weeks, the standard therapy for GON and MIG was applied over 6 months continuously; the standard therapy arm of TTH had to be stopped, because not enough patients were willing to be treated with an amitriptyline therapy. Outcome measures for all trials were Von Korff Graded Chronic Pain Scale, Quality of Life Scales, patient global assessment, drug intake, and number of days away from work, specific outcome measures of the Hannover Functional Ability Questionnaire (LBP), WOMAC scores (GON), and number of headache days for MIG and TTH. After 6 months, data were collected by telephone interviewers, blinded against verum and SA therapy, from 3351 patients: $n = 1162$ for LBP; $n = 1007$ for GON; $n = 794$ for MIG; and $n = 409$ for TTH.

Results. For the main outcome, the criteria difference between verum and SA was not significant in either trial. This difference was smallest in the GON trial and highest in the MIG trial. Both verum and SA were significantly more effective than standard therapy in the LBP and GON trials; in the MIG trial, verum acupuncture over 6 weeks was at least as effective as migraine prophylaxis with β-blocker on a daily basis for 6 months. In the TTH trial, number of headache days was lowered from 16 to 6 (verum) and 16 to 8 (sham) (not significant); whereas, according to a literature review, one would have expected amitriptyline to lower headache days from 16 to 12. In all trials, patients receiving acupuncture took less medication and slight-to-considerable differences between verum acupuncture and SA were observed in the secondary-outcome measures.

Discussion. The GERAC trials showed that acupuncture is highly effective compared to guideline-oriented standard therapy. Acupuncture both at TCM and non-TCM points is at least twice as effective for LBP, three times more effective in GON, at least as effective in MIG, and more effective in TTH (according to a comparison with the literature). The trial design did not allow any conclusion about the placebo aspect of acupuncture, because minimal acupuncture was used for the sham control. Other aspects of the acupuncture treatment (e.g., number and frequency of treatments) might be more important than specific point selections and need further investigation.

In addition to the sham-controlled ART and GERAC trials, the German research programs included several, very large additional pragmatic randomized trials comparing acupuncture to a wait-list also including a nonrandomized cohort,[11–13] a randomized trial comparing acupuncture and metoprolol in migraine,[14] and several large observational studies.[15–19]

Together, the data from the German research programs provide clear evidence that acupuncture is an effective tool in the treatment of chronic pain. However, the correct selection of acupuncture points seems to play only a limited role in clinical effectiveness. After the completion of the three research programs, acupuncture has been included into routine reimbursement in German statutory health insurance since 2007 for chronic LBP and OA of the knee but not for headache.

Acupuncture for Knee Osteoarthritis (Manheimer)

Note: This summary was published in the *Annals of Internal Medicine* 2007;146(12):868–877, and is reproduced with permission. Minor editing has been done for style.

Background

Knee OA is a major cause of pain and functional limitation.

Purpose

The purpose of the study was to evaluate the effects of acupuncture for treating knee osteoarthritis.

Data sources

Data sources were the Cochrane Central Register of Controlled Trials, MEDLINE,® and EMBASE databases to January 2007. No language restrictions were applied.

Study selection

The study included randomized trials longer than 6 weeks in duration that compared needle acupuncture with a sham, usual care, or waiting-list control group for patients with knee OA.

Data extraction

Two (2) authors independently agreed on eligibility, assessed methodological quality and acupuncture adequacy, and extracted outcome data on pain and function measures.

Data synthesis

Eleven (11) trials met the selection criteria, and 9 reported sufficient data for pooling. Standardized mean differences were calculated by using differences in improvements from baseline between patients assigned to acupuncture and those assigned to control groups. Compared with patients in waiting-list control groups, patients who received acupuncture reported clinically relevant short-term improvements in pain (standardized mean difference, −0.96 [95% confidence interval (CI), −1.21 to −0.70]) and function (standardized mean difference, −0.93 [CI, −1.16 to −0.69]). Patients who received acupuncture also reported clinically relevant short- and long-term improvements in pain and function compared with patients in usual-care control groups. Compared with a sham control, acupuncture provided clinically irrelevant short-term improvements in pain (standardized mean difference, −0.35 [CI, −0.55 to −0.15]) and function (standardized mean difference, −0.35 [CI, −0.56 to −0.14]) and clinically irrelevant long-term improvements in pain (standardized mean difference, −0.13 [CI, −0.24 to −0.01]) and function (standardized mean difference, −0.14 [CI, −0.26 to −0.03]).

Limitation

Sham-controlled trials had heterogeneous results that were probably due to the variability of acupuncture and sham protocols, patient samples, and settings.

Conclusions

Sham-controlled trials show clinically irrelevant short-term benefits of acupuncture for treating knee OA. Waiting-list–controlled trials suggest clinically relevant benefits, some of which may be due to placebo or expectation effects.

Acupuncture for Selected Neurologic Disorders: An Overview on the Evidence for the Last 10 Years (Park)

Acupuncture has been widely used for a range of neurologic disorders, mainly in Asian countries, and recently in the West. In spite of popular clinical applications, evidence to support the use of acupuncture needs to be established. A brief and moderate evaluation on the available evidence of acupuncture accumulated during the last 10 years for some neurologic disorders including Bell's palsy, spinal-cord injury, spasticity, whiplash, and trigeminal neuralgia was presented. Clinical studies of acupuncture for the aforementioned neurologic disorders published between 1997 and October 2007 were identified from PubMed and personal files, and were reviewed using the U.S. Preventive Services Task Force Ratings.[20] These grade the Task Force's recommendations according to one of five classifications (A strongly recommends; B recommends; C makes no recommendation for or against; D recommends against; and I concludes insufficient evidence) reflecting the strength of evidence and magnitude of net benefit (benefits minus harms), and the quality of the overall evidence for a service on a 3-point scale (good, fair, poor).

For Bell's palsy, 7 studies that were asserted to be randomized (total $n = 1017$) were carried out in China and published in Chinese. While no harmful adverse events were reported, four studies that tested acupuncture additionally to or comparatively against steroid + vitamin B reported positive results,[21–25] another study reported superiority of electroacupuncture (EA) to surface-electrode,[26] and yet another study reported nonsignificance between acupuncture and manipulation.[27] In summary, other than in clear viral infection, for which antiviral agents and steroids are proven to be effective, acupuncture may have served clinical purposes with the recommendation rating between B and C, though methodologically rigorous study is required.

Regarding acupuncture studies for spinal-cord injury, one randomized controlled trial (RCT) on neurologic and functional recovery, two RCTs, one controlled study, and an observational study on pain in patients with spinal-cord injury were identified from a PubMed search; none reported any adverse events. By far, the largest study concluded that the use of concomitant auricular and electrical acupuncture therapies, when implemented early in acute spinal-cord injury, can contribute to significant neurologic and functional recoveries.[28] Meanwhile, two other good-quality RCTs, although underpowered, reported nonsignificant results,[29,30] while two relatively inferior-quality studies reported significance.[31,32] Meanwhile, most acupuncture studies for bladder control in patients with spinal-cord injury, including two RCTs[33,34] and two case series,[35,36] indicated favorable outcomes despite limited quality. All in all, the recommendation rating for pain and bladder control in patients with spinal-cord injury is close to C with potential toward B.

Spasticity is a complex indication for acupuncture, and several studies measure effects on spasticity as a secondary outcome.[37,38] Very few studies exist on acupuncture for treating spasticity. Mukherjee et al. reported that a combination of EA and muscle-strengthening exercise for 6 weeks significantly reduced spasticity from a crossover study involving 7 patients with chronic stroke.[39] However, the placebo-controlled RCT of Fink et al.[40] concluded that acupuncture has not shown significant effects on leg spasticity and reported neurophysiologic evidence of needle acupuncture causing spastic effects. Overall, acupuncture has not yet been shown to be beneficial in managing spasticity resulting from a variety of neurologic conditions. Research in this area has been limited (current evidence ratings range between C and D, and is close to D).

Whiplash is broadly defined as acute/chronic neck or cervical myofascial pain. Trinh et al. concluded in their review that, for chronic mechanical neck disorders, there is moderate evidence that acupuncture is more effective than sham when measured immediately post-treatment, and that this effect is maintained at short-term follow-up.[41] Therefore, only six acupuncture studies for acute neck pain/whiplash were reviewed. Harmful adverse events were rarely reported, and four studies testing electroauricular acupuncture,[42] laser acupuncture,[43] and distant acupuncture[44,45] reported a significant effect compared to SA, while in the other studies, the results of laser,[46] dry needling,[44] and auricular acupuncture[47] were reported to be negative. After weighing the benefits and risks, a rating between B and C was suggested.

In the treatment of trigeminal neuralgia, included studies used diverse applications of acupuncture including injection on acupoints, cupping, bloodletting, and deep needling. Five (5) of the studies were methodologically poor in comparative controls ($n = 5$) and the other study was a case series. All reported favorable outcomes[48–52] except the study for acupoint injection.[53] Clinicians who seek nonpharmaceutical and non-neurosurgical approaches for this condition may provide benefit for patients by first trying acupuncture (suggested rating of C).

In summary, based on the available literature, for Bell's palsy, spinal-cord injury, whiplash or neck pain, and trigeminal neuralgia,[54] clinicians' recommendations for acupuncture may vary between "clinicians should discuss the service of acupuncture when benefit outweighs risks, or do so if individual patient considers when the benefits are close to risks." However, for spasticity, more studies are necessary to make clinical recommendations. The most promising research data on acupuncture for a selected group of neurologic conditions is in the treatment of Bell's palsy and whiplash/neck pain; however, evidence-based recommendations are not yet conclusive.

Acupuncture in Mental Health (Schnyer)

The combined results of community surveys conducted face-to-face in 17 countries on 4 continents ($n = 85{,}052$), indicate that mental health disorders including anxiety, mood, and substance abuse are very common and cut across cultural domains.[55] Although significant advances have been made, response to medication is often partial and inadequate and there are few, if any strategies for prevention or cure. Mental-health-related disability for these common conditions seriously impacts functionality, productivity and socialization. Very few well-designed and adequately powered studies of acupuncture have been conducted in this area.

Three (3) recent systematic reviews[56–58] indicate that there

is insufficient evidence to determine acupuncture's efficacy in the treatment of depression, and recommend the need for further studies. In major depression, compared to invasive acupuncture-like controls at valid acupuncture points,[59–61] the effect varies between studies; for depression during pregnancy,[62] acupuncture was significantly more effective than sham. EA was as effective as amitriptyline and mianserin and had fewer side effects.[63–68] As an augmentation to mianserin, acupuncture showed a slight benefit,[69] and laser acupuncture was significantly more helpful than placebo laser.[70] In patients with bipolar disorder, acupuncture augmentation of antidepressants yielded significant improvement over medication alone.[71] There are no studies of acupuncture augmentation of the newer antidepressant medications (selective serotonin reuptake inhibitors and serotonin norepinephrine reuptake inhibitors).

In the treatment of anxiety neuroses,[72] generalized anxiety,[73] preoperative anxiety,[74] and post-traumatic stress disorder, acupuncture seems very promising.[75] Very little data are available on acupuncture for insomnia. A review of clinical case series[76] indicates that it may be an effective therapy, and two systematic reviews[77,78] emphasize the need for further studies.

Acupuncture has been found to be effective for relieving withdrawal from opiates.[79,80] Supportive evidence of acupuncture for opiate dependence, however, usually comes from noncontrolled, small trials.[81] A meta-analysis (n = 1,433) of auricular acupuncture for cocaine dependence[82] found no significant differences between acupuncture versus no acupuncture for any measure of drug use. In treatment for alcohol withdrawal symptoms, there are a few published studies and no systematic reviews are available. A combination of auricular and body acupuncture has been used. When compared to nonspecific acupuncture points, the results are mixed in two separate studies.[83,84] When used as an adjunct to pharmacotherapy,[85] acupuncture showed some promise. Laser acupuncture compared to sham[86] did not show significant benefit. In smoking cessation, acupuncture suggested promise in earlier trials.[87–89] In a recent meta-analysis,[90] auricular acupuncture was found to be effective for smoking cessation, independently of the points used. However, a recently updated review[61,91] showed no consistent evidence that acupuncture is superior to no treatment.

Although several systematic reviews of acupuncture for depression, anxiety, and substance abuse have been published in the last decade, most of the studies included are of very poor methodological quality, making it very difficult to draw a conclusion about its potential efficacy. There is a need for further research in this area.

Does Acupuncture Relieve Back Pain? A Contemporary Look at the State of the Science (Sherman)

Back pain is the most common reason for which Americans seek acupuncture care. In 1997, at the Consensus Development Conference, the committee concluded that "acupuncture might be a reasonable option" for treating persons with back pain. However, little solid research existed to buttress those conclusions. In the intervening decade, a number of systematic reviews have been published and five large trials have been completed in the United States and Europe even more recently. In 2005, two published reviews of acupuncture for back pain found that for chronic back pain, acupuncture had small benefits compared with no treatment and sham acupuncture in the short term. Acupuncture added to conventional care seemed to improve pain and function better than conventional care alone. However, there was no evidence that acupuncture is better than other conventional or CAM therapies. Both reviews acknowledged that trials were generally of low quality. The newer and larger trials have found small to moderate benefits of acupuncture compared with no treatment or conventional care, but have cast doubt upon acupuncture's benefits over sham acupuncture. The paradoxical finding of three large studies that verum acupuncture is not better than "sham" acupuncture but both are better than usual care raises questions about how these results should be interpreted in the context of improving patient care. While such data clearly suggest that traditional acupuncture points and meridians are not necessary for achieving therapeutic benefits from acupuncture treatments, they do not resolve the controversy of whether sham acupuncture is actually an active treatment. Thus, it is not clear whether or not nonspecific effects, such as the patient's expectations and the patient–provider relationship, are largely responsible for the benefits of the treatments. Insufficient evidence exists regarding the effects of acupuncture on patients with acute low back pain. Future research should focus on mechanisms of action of acupuncture for pain, evaluation of "optimal dosing" of acupuncture, the value of acupuncture within the context of a broader "package of care," and trying to predict in advance those who will respond favorably to acupuncture treatments.

The Use of Acupuncture to Treat Women's Health Complaints: An Overview of Acupuncture Research (Smith)

Women's health needs arise primarily due to the complexity of the female reproductive system and relate to specific conditions relating to pregnancy, gynecologic disorders, menopausal symptoms, benign breast disease, and female cancers. The annual prevalence of female-specific conditions among women in the United States found 21% of women reported having a female-specific condition.[92] The most common complaints were gynecologic disorders (7.4%), pregnancy-related conditions (6.4%), and menopausal symptoms (5.3%). This data set clearly identifies that women's use of health care is related to female-specific conditions.

Are these patterns of need and health service utilization mirrored by acupuncture? Data from a survey in the United States reported lifetime use of acupuncture to be 4.1%,[93] and acupuncture to treat women's health conditions did not rate in the top 10 of health conditions. MacPherson et al.[94] in the United Kingdom reported that the use of acupuncture for gynecologic or obstetric conditions was 8% among women receiving acupuncture.

A literature review of the main gynecologic and pregnancy disorders reported by women was undertaken. Four (4) databases (Pub Med, Cochrane Library, AMED, and Embase from inception to October 2007) were searched using key words. Only English-language papers were accessed. To summarize, there is an increasing body of research for women's health over various stages of the reproductive health span and supportive care for health problems later in life. However, the areas of research evaluating acupuncture

are not specifically in response to consumer demand. There is a greater body of research in relation to pregnancy, and the menopause, and a lack of research in relation to common gynecologic conditions (e.g., premenstrual syndrome [PMS] and painful periods).

The body of evidence from RCTs in relation to gynecologic conditions is limited to the areas of premenstrual syndrome and period pain. Evidence from a Cochrane systematic review of acupuncture to treat period pain included one small trial and showed acupuncture to be significantly more effective for pain relief (odds ratio 9.49, 95% CI 1.74–51.80), use of analgesics (weighted mean difference [WMD] −0.35, 95% CI −1.06 to 0.36).[95] More recently published trials also suggest a benefit from acupuncture. One (1) placebo-controlled trial of acupuncture for PMS was found. This showed a benefit in the acupuncture group (77%) versus 6% in the control group.

A greater body of research has been conducted in relation to the use of acupuncture during pregnancy. RCTs have been reported in relation to depression, insomnia, acupuncture for birth preparation and during labor, and systematic reviews reported in the areas of nausea, back or pelvic pain, breech presentation, induction of labor, and pain relief. Evidence from trials of acupuncture to treat nausea suggests a benefit from acupuncture: (8 RCTs, $n = 16{,}550$, all modalities reduced nausea relative risk [RR] 0.47, 95% CI 0.35–0.62, $p < 0.001$, and vomiting RR 0.59, 95% CI 0.51–0.68, $p < 0.001$).[96] The Cochrane review of acupuncture to treat back and/or pelvic pain reports acupuncture reduces pain intensity (RR 0.98, 95% CI 0.85–1.12[97]). The effect of moxibustion on breech presentation[98]: reduced need for external cephalic version (ECV) RR 0.47, 95% CI 0.33–0.66, decrease use of oxytocin (RR 0.28, 95% CI 0.13–0.60); however, the number of trials was small. There is some evidence of women requiring less pain relief during labor following acupuncture.[99] Seven (7) RCTs of acupuncture to treat symptoms of menopause were found. These studies vary in the design and the control groups used. The overall evidence is currently unclear, with three trials reporting a benefit and four trials showing no benefit.

A review of the literature in relation to the use of acupuncture for women's health highlighted several directions for future research. There is a need for longitudinal data documenting women's use of acupuncture and examining patterns of use over time. The review identified a number of promising acupuncture interventions; further research is required with consideration given to the use of appropriate controls in RCTs. Qualitative research provides a holistic perspective to women's experience of acupuncture, and future qualitative research could be nested within intervention studies. Where preliminary clinical evidence of a benefit exists, it would be advantageous to include mechanistic outcomes for selected women's health conditions. Finally, inclusion of cost effectiveness data should be considered.

Functional Bowel Disorder: A Model of Integrated Medicine (Sung)

There is an ever-increasing demand in use of complementary medicine (CM) worldwide, and an integrative approach of CM and Western medicine (WM) is very much in need. Patients utilize CM because it emphasizes holistic care and often allows an active participation in treatment. On the other hand, there is often poor doctor–patient communication in WM and, at least in the minds of patients, WM remedies have more side-effects.[100] However, most patients believe that there are many diseases that require potent WM and drastic surgical operation for a cure. Therefore, an integration of CM and WM, if successfully put into action, will give the best of both worlds.

Functional bowel disorders such as irritable bowel syndrome (IBS) offer a good model to study the feasibility of CM and WM integration. Irritable bowel syndrome is an extremely common condition of otherwise healthy individuals presenting to family doctors and gastroenterologists, both in the West[101] and the East.[102] In WM, IBS is characterized by abdominal pain, change in bowel habits, and relief of symptoms by defecation. These clinical features, although they characterize the syndrome, do not quantify the severity of the condition. Despite the well-established clinical criteria for the diagnosis of irritable bowel disease, there is no laboratory test to diagnose the condition reliably. In CM, symptoms mimicking IBS are described as insufficiency of spleen function and stagnancy of liver energy. In the theory of CM, suppressed emotion leads to stagnancy of energy in the liver. This in turn leads to an attack of the liver on the spleen and the stomach, leading to abdominal pain. There are several traditional herbal formulae that have been used in the treatment of this condition. In a study recruiting four CM practitioners to test a group of patients with IBS defined by Rome Criteria in WM, the concordance rate of diagnosis, principle of treatment, and prescriptions between the CM practitioners was found to be only around 50%–58%.[103] However, after a thorough discussion between WM and CM practitioners, and a consensus agreement on the criteria of diagnosis, the concordance rate was improved to around 80%. This study shows that common diagnostic criteria among CM practitioners can be reached.

Is double-blinded placebo-controlled trial a feasible method in the study of herbal medicine for IBS? Based on Rome II criteria, a group of patients with IBS was recruited in a randomized study to receive either a common formula used for most common pattern found in IBS (Liver invading the Spleen), *Tong Xe Yao Fang*, or placebo.[104] There was a trend toward improved global symptoms of IBS but the difference in symptom improvement fell short of statistical significance. Albeit a negative study, it establishes the feasibility of conducting a CM randomized, placebo-controlled trial of IBS.

Besides herbal medicine, acupuncture has also been tested in the treatment of functional bowel disorder including nausea, dyspepsia, and IBS.[105] Unfortunately, studies on acupuncture are difficult to interpret because of the heterogeneity of the study designs and flaws in methodology.[106] The lack of proper control in most studies has created another difficulty in the interpretation of data. Unlike testing of new drugs, it is difficult to devise a physiologically inert needling procedure that is indistinguishable from real acupuncture.[107] Robust data will be needed to substantiate the benefit of this form of therapy in functional bowel diseases. With support from the National Center for Complementary and Alternative Medicine, investigators from the United States and Hong Kong have worked out the methodology of invasive and noninvasive sham acupuncture in the

study of IBS. The initial results from using acupuncture in an animal model of IBS have been promising.

Acupuncture in the Care of Patient with Cancer (Vickers)

Cancer is the uncontrolled growth of dedifferentiated cells, which invade adjacent tissues and may spread to other areas of the body. Most invasive cancers will, if left untreated, lead to the death of the patient and, accordingly, tumor control has long been the focus of cancer care. Recent years have seen increasing emphasis on symptom control and quality of life. Cancer and its treatment cause a wide variety of symptoms including pain, fatigue, nausea, anxiety, depression, shortness of breath, hot flashes, xerostomia (dry mouth), incontinence, erectile dysfunction, lymphedema, weight gain, and neuropathy. Acupuncturists claim to be able to help almost all of these symptoms. In this paper, the evidence for acupuncture's value in treating cancer-related symptoms is reviewed and some of the practical issues associated with acupuncture service provision in a large cancer center will be discussed.

Nausea and vomiting are perhaps the most well-known side-effects of cancer therapy. The effectiveness of antiemetic medication has improved dramatically since the introduction of the $5HT_3$ antagonists, and severe, acute vomiting is no longer common in patients undergoing chemotherapy. Nonetheless, many patients still experience at least some vomiting, and delayed nausea—lasting for several days after chemotherapy—is prevalent. A considerable number of randomized trials have suggested that acupuncture is effective for postoperative vomiting. Ezzo and colleagues[108] recently conducted a systematic review of acupuncture for chemotherapy (11 trials; 1247 patients). The overall result was that acupuncture-point stimulation reduced acute vomiting (RR 0.82; 95% CI 0.69–0.99; $p = 0.04$), but did not have a statistically significant effect on nausea. There were some differences between acupuncture modalities, with acupressure reducing mean nausea severity (standardized mean difference = –0.19; 95% CI −0.38 to −0.01; $p = 0.03$), needle stimulation having the greatest effect on vomiting, and noninvasive electrostimulation showing little benefit for any outcome. The effects of acupuncture appeared far less when concurrent $5HT_3$ antagonists were given: It is unclear whether this is because the two treatments share a common pathway or because a constant relative risk reduction, associated with acupuncture, leads to a smaller absolute risk reduction in patients given effective concomitant treatment.

Pain can be caused by cancer directly or can result from a variety of cancer treatments, of which surgery is perhaps the most important. Cancer surgery often requires deep resection and injury of nerves and tissues adjacent to the tumor. Alimi et al. reported a clinical trial in which patients with refractory cancer pain, mainly neuropathic in nature, were randomized to either indwelling auricular needles or to one of two types of placebo.[109] Pain scores were reduced by 36% in the acupuncture group: There was little change in controls, and differences between groups were statistically significant. A randomized trial of acupuncture for pancreatic cancer pain at Memorial Sloan-Kettering Cancer Center (MSKCC) was closed early due to inadequate accrual: Most patients were at an earlier stage of disease and pain was well controlled. Nonetheless, analysis of the 14 randomized patients demonstrated a trend for a difference between acupuncture and placebo ($p = 0.072$), with pain scores approximately 2 points lower on a 0–10 scale in the acupuncture group (unpublished data). We have conducted two additional randomized trials of acupuncture for pain following cancer surgery at MSKCC. The first study involved an unusual acupuncture intervention: Indwelling needles were retained in place for 4 weeks after surgery in order to provide ongoing stimulation of acupuncture points without the need for patients to return to the hospital. However, pain intensity scores and medication use were virtually identical in patients undergoing acupuncture ($n = 63$) compared with placebo controls ($n = 59$) (unpublished data). A trial of acupuncture for pain and dysfunction after surgery for head and neck cancer has been completed; a paper will be submitted shortly for publication. This trial is particularly interesting as it includes assessment of dry mouth, a symptom related to the use of radiation close to the salivary glands.

Two other studies at MSKCC have failed to find benefit of acupuncture for cancer-related symptoms. In a small pilot trial of acupuncture for shortness of breath in patients with advanced cancer, dyspnea scores were slightly higher for patients receiving true versus placebo acupuncture, for both the period immediately following acupuncture treatment and during 1-week follow-up (differences between means of 0.34, 95% CI −0.33, 1.02, and 0.56, 95% CI −0.39, 1.51, respectively). As the 95% CI excluded the prespecified minimum clinically significant difference of a 20% greater improvement in patients undergoing acupuncture, we were able to conclude that the acupuncture technique used in this trial is unlikely to have effects on dyspnea importantly larger than placebo for patients with advanced cancer.[110] The second trial involved hot flashes: 72 women with breast cancer experiencing three or more hot flashes per day were randomized to receive either true or sham acupuncture. The mean number of hot flashes per day was reduced from 8.7 (standard deviation [SD] 3.9) to 6.2 (SD 4.2) in the true acupuncture group and 10.0 (SD 6.1) to 7.6 (SD 5.7) in the sham group. True acupuncture was associated with 0.8 fewer hot flashes per day than sham at 6 weeks, but the difference did not reach statistical significance (95% CI −0.7, 2.4; $p = 0.3$).[111]

Acupuncture has traditionally been provided in the United States as part of stand-alone clinics. This can work well for chronic cancer-related problems such as pain. Acute or treatment-related symptoms require integration of acupuncture care into a busy and complex clinical environment. For example, preoperative acupuncture has to be conducted after placement of the epidural but before the patient is transferred to the operating room, but without delaying either. Treatment of nausea involves a similar timing problem—the patient must be treated after admission to the chemotherapy suite but before the start of the chemotherapy infusion—and also requires additional equipment for electrostimulation. Accordingly, routine integration of acupuncture "on the floors" is unlikely pending compelling evidence of a considerable patient benefit.

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