

Acupressure for Symptom Management: The Evidence to Date and Research Opportunities

Introduction

Patients seek complementary/alternative healthcare therapies such as acupressure for a number of reasons—most often to promote overall wellbeing or to ameliorate a physical symptom such as musculoskeletal pain, nausea or anxiety [1]. Acupressure, a complementary therapy steeped in the traditions of ancient Chinese medicine, is said to both treat a variety of symptoms and to promote holistic wellbeing. Although the practice of acupressure has been in existence for thousands of years, research on the impact of acupressure as a treatment for health symptoms is in its infancy. Additionally, many healthcare practitioners are unaware of both the science behind the practice of acupressure and the evidence as to its impact on commonly experienced health symptoms. The purpose of this paper is to identify the theoretical underpinnings behind the practice of acupressure as a complementary therapy, to summarize the research that has been done related to the use of acupressure to treat a number of health conditions, and to suggest directions for future research in the use of acupressure to address specific patient health concerns.

Acupressure and Traditional Chinese Medicine

Acupressure is an ancient healing modality that, like acupuncture, is based on the principles of traditional Chinese Medicine [2, 3]. The theoretical basis of energy flow was developed by ancient Chinese healers, based on experience and anatomic observations [4]. According to these principles, Qi (energy) flows through the body in 12 defined circulation pathways called meridians, and additional paths called extraordinary flows [5]. These energy pathways are connected to the major body organs and the nervous system, and are accessed through over 350 identified “acupoints” [4]. Freely flowing Qi through the body channels is associated with health and vitality; however, excess or deficient Qi, or a block in Qi flow is associated with less than optimal health or illness conditions [6]. Traditional Chinese medicine developed acupuncture and acupressure as modalities to remove blockages to energy flow

and to promote optimal flow of energy throughout the body, thereby increasing the capability of the patient's own body to regenerate or heal itself and restore optimal wellbeing [4, 7].

Acupressure is similar to acupuncture in the basis for treatment, selection of points for treatment and the goal of restoration of optimal energy flow within the body. The difference lies in the modality chosen to access the energy pathways. Acupuncture uses fine needles inserted into the skin at the identified acupoints to restore energy flow, whereas acupressure uses pressure, rather than needles, on the selected points to restore energy flow. Both acupuncture and acupressure are used more widely in eastern countries, but are being increasingly used in western countries. The potential benefit of acupressure over acupuncture is that acupressure affords a non-invasive therapy with very few identified contraindications for use [2]. In addition, if a specific acupoint is demonstrated to be effective in treatment of a health condition, patients or their significant others can be instructed in application of acupressure to the identified acupoint [8-10], empowering patients to actively participate in their own healing.

Scientific Basis of Acupressure Effects

A number of scientific theories have been developed to explain the effects of acupuncture and acupressure. Some authors propose that the meridians represent pathways of the nervous system [4, 11]. Several research studies support this theory, finding a reduction in electrical impedance between acupoints along meridians, in comparison with points that are not along meridians [12, 13]. Other researchers found trends toward lower impedance between meridian acupoints, but the findings were not statistically significant [14, 15]. Ahn posited that the finding of reduced electrical impedance relates to the meridians being located along collagenous bands of tissue [14]. Some studies posit that the effects of acupuncture and acupressure may be related to vasodilation and/or vasoconstriction effects of, based on point location within the meridian system [16]. Magnetic Resonance Imaging studies of the brain during acupuncture and acupressure indicate changes in activation of specific areas of the brain,

based on the acupoints stimulated, with both similarities and differences brain activation when the same points are stimulated by acupuncture and acupressure [17, 18]. Although studies have begun to demonstrate the neurologic and blood flow effects of acupuncture and acupressure, additional research is needed to more thoroughly explain the underlying mechanisms for the effects of these therapies.

Even though acupressure and acupuncture have been used for many centuries to treat a number of health conditions, it is only in the last 20 years that well designed research studies have investigated the effectiveness of these therapies. Much of the earlier research was not well controlled and did not involve randomized research design. There has been increased interest in acupressure research in recent years, but still, many areas are unclear and unexplored.

Acupressure Research

Methods

A literature search was undertaken to identify research findings related to the impact or effect of acupressure on specific health conditions or physical symptoms. The search included PubMed, CINAHL, and Alt HealthWatch databases using the keyword acupressure, with inclusion criteria of clinical trial, metaanalysis, randomized clinical trials, English language, and publication in the last 20 years. The searches returned 206 manuscripts in PUBMED, 181 in CINAHL, and 61 in Alt HealthWatch. The majority of the manuscripts were cross-listed in at least two of the three databases, yielding 221 manuscripts for review. Upon abstract review, manuscripts reporting studies using auricular acupressure, acupressure together with other treatment modalities, and acupressure using electrodes, were not reviewed. In addition, manuscripts reporting only on physiologic response to acupressure (such as changes in brain imagery or vasodilation), or limited to measurement of general wellbeing in the absence of any physical symptoms were removed from the synthesis review. Only studies investigating the effect of acupressure on specific health conditions or symptoms were included in the review. Ultimately, 49 studies were reviewed for synthesis. Of the reviewed studies, acupressure had been used to relieve symptoms of

nausea and vomiting, cancer-related fatigue, low back pain, labor pain, dyspnea, headache, insomnia, dysmenorrhea, anxiety, to promote muscle strength recovery after stroke, to improve lower limb blood flow in peripheral arterial disease, and to increase alertness in the school classroom.

Research Findings

Acupressure for Symptoms of Nausea: The Pericardium 6 (P6) Acupressure Point

Of all studies reviewed, the most common application of acupressure was using the P6 acupressure point to reduce patients' experience of nausea associated with a variety of circumstances, including chemotherapy, radiation therapy, anesthesia/surgery, and nausea associated with pregnancy. There are several potential reasons for the popularity of this acupressure point: it is easy to locate (3 finger breadths below the wrist crease on the anterior surface of the forearm); patients can be instructed in self-stimulation of the point with relative assurance of accuracy; and the point can be stimulated for a lengthy period of time by wearing acupressure (AP) bands containing a plastic stud placed directly over the P6 point.

From the initial documented study of the use of AP bands by a nurse-sailor to treat nausea associated with chemotherapy [19], to the more recent studies, the majority of findings indicated effectiveness of AP bands in reducing nausea associated with cancer treatment (chemotherapy and radiation therapy). In separate RCT studies, Molassoitis and colleagues [20], Suh [21], and Roscoe [22, 23], all found that AP bands significantly reduced nausea and/or vomiting related to chemotherapy or radiation therapy cancer treatments, in comparison to no AP band control groups. The Molassoitis study was the only one of the reviewed studies in which patients were instructed to manually press on the band studs throughout the day, providing additional P6 point stimulation. Two studies reported on patient use of manual finger pressure rather than AP bands to stimulate the P6 point after chemotherapy. Shin and colleagues [24] found that patients who performed self-acupressure before chemotherapy, prior to meals, and when nauseated had less overall nausea after chemotherapy, and

less daily reported nausea than control group patients for all days except the day of chemotherapy treatment. Dibble and others [25] reported similar findings, with women being treated for breast cancer who were instructed to perform self-acupressure on the P6 point each morning and whenever nauseated reporting less nausea and vomiting than the control group and less emesis than the placebo acupressure group.

Findings related to use of acupressure bands for nausea of early pregnancy were a bit less consistent. Length of time for use of the bands and whether pressure was applied to the stud to activate the P6 point was inconsistent. In a pre-post, longitudinal study of women experiencing nausea in early pregnancy, Stainton & Neff found that nausea, vomiting, and retching were decreased approximately 50% with use of AP bands, with relief being greater when mild to moderate nausea was present at the time of study entry [26]. Gurkan & Arsian [27] found that both women who wore AP bands on the P6 point and those who wore them on a point opposite P6 on the back of the arm experienced a reduction in frequency and severity of nausea symptoms, compared to a control group, in their RCT investigation. Norheim and colleagues also found that both AP bands and “sham” bands (without studs) worn in the same P6 location were effective in reducing symptoms, but the duration of symptoms was reduced only in the active AP band group [28]. In a study conducted by Heazell and colleagues, AP bands were not found to reduce the need for antiemetic medications or IV fluids among women hospitalized for treatment of nausea/vomiting of early pregnancy, but there were fewer women in the “active” AP band group who required four or more days of hospitalization [29]. In this study, women only wore the AP bands for only eight hours daily (unlike the other AP band studies), and did not press on the band studs. No subjective data was collected about participants’ perceived experience or severity of nausea. Studies by Obrien and colleagues found no significant differences reductions in nausea for pregnant women wearing AP bands versus either sham bands or no bands; women were not instructed to press on the band studs, and could wear the bands on one arm or both arms [30]. Finally, Sinha et al. found no

differences in nausea or vomiting during labor and delivery between women who wore AP bands versus sham bands in the same location [31]. Women were not instructed to press on the bands in this study.

Two studies investigated the impact of finger pressure stimulation of the P6 on pregnancy associated nausea and vomiting. A randomized study by Belluomini and colleagues found that manual stimulation of the P6 point for 10 minutes four times daily resulted in significantly less nausea than stimulation of a sham point or no stimulation, but did not reduce the frequency of emesis [32]. Another RCT study using practitioner provided manual finger pressure on the P6 point for 10 minutes prior to each meal resulted in less nausea and vomiting and a lower level of ketonuria than either pressure on a placebo acupoint or no acupressure among women hospitalized for hyperemesis gravidarum [10].

The P6 point has also been studied in relation to inter-operative and post-operative nausea. A majority of these studies used AP bands to stimulate the P6 point, but there was no mention about instructing patients to press on the studs when nauseated. The length of time the AP bands were worn and assessment of nausea varied among the studies, as did the tools used to measure nausea.

Reports of the impact of acupressure on nausea/vomiting during and after spinal anesthesia are inconsistent. A double blind RCT conducted by Harmon and colleagues determined that patients who wore AP bands during cesarean section surgery with spinal anesthesia and for 6 hours after returning to the hospital unit from the surgical area reported less nausea and vomiting than patients not wearing AP bands [33]. These findings were supported by a more recent RCT study conducted by Stein and colleagues [34]. On the other hand, Ho and others found no statistically significant differences in intraoperative nausea/vomiting between patients wearing active AP bands and placebo bands, although the Ho study measured effects only during the intraoperative period [35].

There are also conflicting findings relative to use AP bands during and after general anesthesia. Windle and colleagues reported no significant difference in post-operative nausea and vomiting among day-surgery patients who wore AP bands, sham bands or no bands; however nausea and vomiting were

measured only by documentation in the medical record, and bands were worn only in the post anesthesia recovery room [36]. Schultz and colleagues also found no significant difference in nausea and vomiting among women having gynecologic surgery who wore AP bands versus placebo bands [37]. In contrast, Barsoum, Perry & Fraser reported that patients wearing AP bands had significantly less nausea in the first two days of hospitalization after surgery than patients wearing sham bands or no bands [38].

Two reviewed studies used manually applied stimulation of the P6 point with surgical patients. Lu & Lu reported that among randomized groups of patients sedated for dental procedures, those in the acupressure group reported less nausea than the control group [39]. A study by Ming et al. compared the impact of manual AP applied to P6 and Heart 7 (H7) points at a standardized pressure before surgery, prior to discharge from the recovery room and 10 hours after surgery, to AP band treatment, and attention control. Findings indicated that the manual pressure AP group had significantly less nausea and vomiting post-operatively than the control group. AP band group nausea was somewhat lower than control, but the findings were not statistically significant [40].

In review of the above studies related to the P6 acupressure point, several issues become apparent. First, there is no standardization of treatment. Many studies used AP bands, but there was little consistency in length of time wearing the bands. Additionally, in some studies, patients were instructed to press on the studs within the bands, while in other studies patients simply wore the bands. There was no documented evidence of efforts to assure continued accuracy of band placement, when bands were worn for extended periods. In the studies using finger pressure to achieve P6 stimulation, there was no standardization of the degree of pressure on the acupoint. Finally, there was no standard measure of the nausea/vomiting experience among the studies.

It appears that the most positive impact of acupressure at the P6 point on nausea results may be achieved through a combination of AP bands with manual pressure on the embedded stud, or through simple manual stimulation of the P6 acupressure point several times daily. Stimulation of the P6

acupressure point for nausea related to a number of causes is a plausible low-cost intervention. However, additional research is needed, particularly related to standardization of treatment, both in use of AP bands and manual pressure on the P6 acupoint.

Acupressure for Dysmenorrhea and Labor Pain: The Spleen 6 Acupoint:

Although the P6 acupressure point is the most widely researched treatment point, researchers have also studied the impact of another singular point on patient symptoms. The Spleen 6 (SP6) point has been studied in relation to its effect on pain and efficiency of labor, as well as its effect on dysmenorrhea. Like the P6 point, SP6 is easily accessible, being four finger widths (3 cun) above the highest point of the inner ankle bone at the inferior border of the Tibia [2]. Unlike the P6 point, however, only manual stimulation of this point has been investigated. Mirbagher-Ajorpaz and others conducted a randomized control trial with university students who experienced pain with menses, applying either standardized pressure or light touch to the SP point for 20 minutes, finding significantly higher reduction in pain scores in the treatment group than in the sham treatment group [41]. In another RCT study with female university students, Chen & Chen found that 10 minutes of practitioner provided acupressure at the SP6 point reduced both menstrual pain and anxiety levels significantly more than the controlled rest only treatment [42]. Additionally, during the participants' subsequent menstrual cycle, self-provided acupressure to the SP6 point reduced reported pain more significantly than rest alone. June and colleagues also investigated the impact of SP6 acupressure on dysmenorrhea in college students in a RCT using either pressure or light touch at the identified point [43]. The treatment group reported less pain for up to 2 hours after the treatment. Most recently, Chen & Chen conducted a randomized study investigating the impact of the Stomach 36 (ST36) and Large Intestine 4 (LI4) point in addition to the SP6 point on dysmenorrhea symptoms. Study results indicated that use of SP6 together with LI4 resulted in reduction of pain, distress and anxiety associated with dysmenorrhea [42].

The SP6 acupressure point has also been investigated in relation to its effect on pain associated with labor and delivery. Studies conducted by Lee, Chang & Kang, Hjelmstedt and colleagues, and Kashanian & Shahali implemented similar interventions of either active acupressure to the SP 6 point or light touch control to the same point during contractions for a 30 minute time frame, once women had achieved at least 3cm cervical dilation [44-46]. All studies found significant reduction of labor pain in the treatment group, compared to the touch-control group. In addition, the Lee study found that acupressure also significantly shortened the time from 3cm dilation to full cervical dilation [46].

Evidence for use of the SP 6 acupoint for both dysmenorrhea and labor pain is positive. There is also more consistency within the studies—use of manual finger pressure on one point (SP6), for a defined period of time, and with at least one standard measure—VAS for pain measurement. Description and standardization of finger pressure would contribute to strength of the studies.

Acupressure for Insomnia: The Heart 7 Point

A number of researchers have investigated the effect of acupressure on insomnia symptoms. All of the reviewed studies used the Heart 7 (H7) point, which is on the ulnar side of the forearm, just below the wrist crease [2]; however only one reviewed study used this point exclusively. In a RCT reported by Sun and colleagues, patients in a long-term care facility who were experiencing insomnia reported significantly less insomnia symptoms after receiving H7 acupressure nightly (5kg pressure using both hands), in comparison to residents who received massage at non-acupressure points or light touch on non-acupressure points [47]. Three other reviewed studies investigated the impact of additional points together with H7, on insomnia symptoms. One study added only the Kidney 11 (K11) point to the H7 point, randomizing patients to active, sham (pressure on non-acupoints 1 cun from true points) and control treatments. Pressure was applied (3-4 kg) for 9 minutes to the points three times per week. Participants in the active treatment group had continued improvement of sleep, and significantly better sleep than the control group, but no significant difference from the sham group [48]. PC6 and SP6 were

added to the K11 and H7 points in a RCT with similar intervention guidelines as the Tsay study (active, sham, and control groups and treatment three times per week), but Reza found that the active AP group reported better sleep quality, latency, duration, efficiency, and reduced sleep disturbances than did both sham AP or control groups [49]. Chen used Governing Vessel 20, Gall Bladder 20, and Extra Point HN in a RCT with treatment, sham treatment points, and control patient groups, providing a five minute massage followed by 10 minute point treatment. Findings indicated the active treatment group had significantly greater improvements in sleep, particularly for nocturnal awakening, and time awake [50].

Use of acupressure for insomnia appears to be a promising, non-invasive treatment, without the potential side effects of interventions such as sedative/hypnotic medications. However, additional research is needed, particularly in terms of determining whether an individual acupoint (H7) is effective in promoting sleep, or whether a standardized combination of acupoints would be more appropriate. Additionally, research is needed to identify the best time frame for applying acupressure in relation to time of retiring to bed.

Acupressure for Respiratory Symptoms

There is beginning evidence that use of acupressure may be beneficial for patients with respiratory conditions. Three studies were identified that investigated the impact of acupressure on respiratory function of patients with Chronic Obstructive Pulmonary Disease (COPD). Unlike the studies related to use of acupressure for nausea, insomnia, or menstrual/labor pain, these studies used a variety of acupressure points for treatment. Each used five to seven points, but only 1 point (Governing Vessel 14) was used in all studies. The Lung 1, Lung 10, and Stomach 36 points were used in two studies, and Pericardium 6, Pericardium 8, Lung 2, Large Intestine 4, Bladder 13, Bladder 23, and Conception Vessel 22 were each used in only one of the three studies. Two of the studies were RCTs [51, 52], and one was a pre-post cross-over design [53]. Treatments were completed three to five times per week in the study for which practitioner provided acupressure was implemented [52], and daily in the studies for which

patients or family members were instructed in providing the treatment [51, 53]. As with identification of treatment points, identification of outcome measures was varied, other than all three studies used the 6-Minute Walk Test. All studies found that perceived dyspnea was reduced in the AP treatment groups, above both sham AP and control for the two studies using sham AP points [52, 53], and above control for the study not incorporating a sham AP group [51].

An additional study investigated the use of acupressure with mechanically ventilated patients, focusing on symptoms of dyspnea and anxiety [54]. This repeated measures design study used Pericardium 6, Large Intestine 4 and Heart 7 points—both Pericardium and Large Intestine points had been used in one of the respiratory studies cited above. Acupressure was provided to ventilated patients daily for 10 days, with findings of reduced heart rate, respiratory rate, dyspnea and anxiety among the treatment group. Once acupressure was discontinued, symptoms of anxiety and dyspnea began to increase 1-3 days after AP treatments were concluded [54].

Although there are limited studies related to the use of acupressure to achieve symptom control in respiratory illness, the initial findings appear promising. Because COPD is a chronic and progressive illness, low cost and effective interventions to improve symptoms, function, and quality of life would be quite valuable. There is need for additional research to determine the most beneficial AP points for symptoms of dyspnea, to determine the optimum frequency of treatment, and to identify whether practitioner or patient/significant other provision of the treatment is equally effective.

Acupressure for Pain Control

Surprisingly, relatively few studies have investigated the impact of acupressure on pain symptoms. Of those found in the literature, aside from the previously discussed studies related to menstrual and labor pain, two investigated the impact of acupressure on low back pain, one investigated the use of AP in treating headache, and one investigated impact on post-operative pain. [55-58]. There was no standardization of AP points used in treatment among the studies, most likely

because point selection is generally specific to the pain source. In the two studies conducted by Hsieh and Kuo investigating treatment of low back pain, AP practitioners chose individualized treatment protocols for each patient, based on symptoms and assessment. In these two RCT studies, AP treatments were compared to standard physical therapy treatments. Both groups had six treatment sessions within a four week period, with data collectors blinded to group assignments. Findings of both studies indicated that pain scores were lower in the acupressure groups [56, 57]. Disability scores were also lower in the acupressure group in their 2006 study [56].

Most recently Hsieh and colleagues conducted a RCT comparing use of muscle relaxants to acupressure plus placebo medication on pain and quality of life among patients with chronic headaches. The AP group received six AP sessions across a four week time frame. AP points were chosen based on location of the headache, but if the location wasn't specific Governing Vessel 20, Bladder 2, Gallbladder 5, Gallbladder 20, and Triple Heater 21 points were used. Findings indicated that VAS pain ratings at [58]1 month were significantly lower in the AP group, as were sleeping disturbances and neck pain. At six month follow-up, the AP group continued to have lower pain VAS scores, and higher QOL scores.

Only one reviewed study investigated the use of AP with postoperative pain: an RCT with patients having arthroscopic surgery [55]. Practitioners stimulated 15 different AP points on the Stomach, Spleen, Bladder, Kidney, Gallbladder, and Liver meridians on the side opposite the surgical site. Control patients received light touch in similar areas 2 cm away from the nearest acupoint. At both 60 minutes and 24 hours after treatment, the AP group reported lower VAS pain scores, and also self-reported fewer doses of analgesics used.

Acupressure in Cancer-Related Fatigue

Three studies have investigated the use of Acupressure to impact cancer-related fatigue [9, 59, 60]. Patients in all three studies had completed chemotherapy and were experiencing symptoms of fatigue, and patients were taught to self-apply acupressure to the identified points (stimulating points,

relaxing points, or sham points). Three of the “stimulating” AP points were consistent among the studies: Large Intestine 4, Spleen 6, and Stomach 36. In the Harris & Zick and Zick and colleagues studies, there were additional stimulating points for the stimulating AP group, and the relaxation AP group included extra point 1, Heart 7, Liver 3, Spleen 6, and the Amnian point. All three studies found benefits in terms of fatigue reduction. Interestingly, both studies that compared relaxation versus stimulating AP points found that patient fatigue was reduced more with the relaxation points than the stimulating points. There was not a significant difference in fatigue scores between patients who performed self-acupressure three times/week or those who did it twice per day [60]; however, it appears that patients do need to continue the self-treatment, as results began to wear off after 2 weeks of no treatment [61].

It appears that acupressure may help to reduce fatigue among cancer patients. However, additional research is needed in the area of impact of acupressure on cancer-related fatigue, as this is a very distressing symptom for many patients battling cancer [62, 63]. It would be beneficial to standardize points among both the stimulating treatment and relaxation treatment protocols, and then compare the effects of the protocols on fatigue and energy levels. Additionally, ideal frequency for treatment should be identified, and the benefit of provision of the treatment by patient/significant other or acupressure practitioner should be determined.

Acupressure Treatment of Other Symptoms—Single studies

In a RCT with stroke patients experiencing hemiplegia, Kang found that use of acupressure together with physical therapy resulted in stronger grip power, less edema, improved wrist and shoulder movement, and better activity of daily living scores than physical therapy alone [64]. This study was conducted in Korea, using an acupressure point identification and naming system different from that used in TCM; therefore, translation to TCM acupressure point names and locations is difficult. Research investigating the use of acupressure to impact sensation, function and quality of life among patients having had a stroke could make a valuable contribution to the body of knowledge about the

effectiveness of acupressure. Because no other studies have been conducted in this area, researchers would have to identify and standardize point selection, develop a treatment and sham treatment protocol, and determine at what time after a stroke, acupressure should be initiated prior to conducting a study.

In another study, Li and colleagues found that stimulation of Gallbladder 34, Stomach 36, Spleen 6, and Spleen 9 improved lower limb blood flow in patients with peripheral arterial disease as compared with rest-control patients [65]. However the changes were not apparent in patients over 80 years of age, and there was no indication how long the improved blood flow may have lasted. Finally, a very recent pilot study indicated that acupressure at the Large Intestine 11 point, for three minutes, three times per week can reduce itching and lichenification associated with atopic dermatitis, when compared to standard care [66]. Additional research is warranted in use of acupressure with patients who have peripheral artery disease and those with atopic dermatitis.

Summary of the Evidence

There is substantive evidence that acupressure can help to reduce nausea associated with a variety of medical conditions can assist in reduction of menstrual and labor pain, and may promote sleep among people experiencing insomnia. There is preliminary evidence that it may also help to ease dyspnea among patients with COPD, may assist in pain control in patients experiencing low back pain, and reduce fatigue among patients struggling with cancer.

Research Issues/Study Limitations

There are a number of factors that limit ability to draw firm conclusions from results of some acupressure research studies, and to confidently recommend healthcare practitioner practice changes of incorporating acupressure into treatment regimens for a variety of symptoms and conditions. First, there is lack of consistency in point selection for interventions. Aside from the P6 point indicated for nausea, the H7 point indicated for insomnia, and the SP6 point indicated for dysmenorrhea and labor

pain, a variety of acupressure points have been used to treating similar conditions. This is most likely due to the fact that acupuncture and acupressure references suggest multiple points to treat the same conditions [5]; thus researchers select from among the recommended points for their treatment protocols. Additionally, acupuncture and acupressure treatments are traditionally individualized to the specific patient [2, 6]; thus, there has not been an emphasis on developing standardized treatment protocols for specific symptom presentation.

There is also no standard for the degree of pressure that is applied during acupressure treatments. Some authors speak of standardizing pressure—often between 2 and 3 kg per hand [46, 47, 49, 50, 67], while others apply pressure until the feeling of “de-qi” (dull ache, tingling, soreness) is achieved [60, 65]. When AP bands are used for stimulation, there is no consistency in whether or not additional pressure is applied periodically to the studs on the bands, and if it is applied, how often it is done. In addition, there is no standard of practice related to how often acupressure should be provided for optimal effect. Treatment may be constant, as in the wearing of AP bands to stimulate the P6 point, may be provided 1 or more times/day, every several days, or weekly; treatments may also be continued for several weeks or occur for only a brief period. There is an indication that the effects of acupressure may fade over time [47, 54, 68], but it is not known how that timeframe differs based on the symptom being treated and the points selected for treatment.

Finally there is the issue of placebo control groups in research. Often sites are chosen that are either relatively close to the active acupressure point, or are located along other meridians or extraordinary flow vessels [25, 50, 52, 69]. Because there are multiple meridians flowing through the torso and extremities, in addition to the extraordinary flow vessels, it is sometimes relatively difficult to access a “sham” point that will not in some way alter energy flow through the body [68].

Suggestions for standardization of Acupressure Research

Although not always possible in translational-type studies, randomized control studies with both “sham” or placebo and true control arms would be preferable [70]. However, there is some concern with using sham acupressure points in close proximity to the true points or along other meridians, as the width of meridians and extraordinary flow pathways is not clearly known, and pressure at any identified point may impact energy flow in some way. Either light touch on the same point, or actual pressure on a point not located within a meridian or extraordinary flow might be preferable for “sham” treatment protocols. Standardization of finger pressure would also be beneficial.

Standards for reporting acupressure research, similar to the Standards for Reporting Interventions in Clinical Trials of Acupuncture (STRICTA) guidelines [71], could be helpful to researchers in designing, conducting and reporting their investigative efforts. All clinical trials of acupressure should include: details about the acupressure points selected with rationale for selection, standardization of pressure used for practitioner provided acupressure, and if possible, for patient provided acupressure; description of the length of time pressure is applied and frequency of application; clear information as to standardization of treatment across practitioners and/or instructions to patients if acupressure is self-provided; and rationale for selection of sham point and degree of pressure (touch versus true pressure at a non-acupoint).

Suggestions for Further Research

It is clear the much research is needed in regards to the effect of acupressure on a variety of patient symptoms and health conditions. Promising areas for potential research include treatment of lower back pain, patient mobility and pain after stroke, treatment of migraine headache, and treatment of fatigue related to cancer. Additionally, translational studies should be done to document practice changes and patient outcomes in terms of use of P6 acupressure for nausea in a variety of circumstances, H7 acupressure for insomnia, and SP 6 acupressure for labor pain and dysmenorrhea. Additionally, research should be done to identify “preferred” points for treatment of specific symptoms

or conditions, when there are a number of points identified as potentially beneficial in the treatment resources. Comparisons could also be made to identify the ideal frequency of acupressure treatments and ideal number of treatments to achieve a desired outcome.

Conclusion

Acupressure is a non-invasive, low cost complementary therapy that is potentially helpful in with variety of health conditions. There is a vast opportunity for researchers to investigate the potential impact of this therapy in improve the wellbeing of many patient populations, and to bring their research findings to the attention of both mainstream and integrative healthcare practitioners.

References

1. Barnes, P.M., B. Bloom, and R. Nahin, *Complementary and Alternative Medicine Use Among Adults and Children: United States, 2007.*, in *CDC National Health Statistics Report #122008*, CDC: Atlanta, GA.
2. Kolster, B.C. and A. Waskowiak, *The Acupressure Atlas* 2007, Rochester, VT: Healing Arts Press.
3. Raheem, A., *Handbook for Clinical Acupressure: Basic Applications*, 2002, Soul Lightening.
4. Chang, S.T., *The Complete Book of Acupuncture* 1976, Berkeley, CA: Celestial Arts. 239.
5. Deadman, P., M. Al-Khafaji, and K. Baker, *A Manual of Acupuncture*. 2nd ed 2011, East Sussex, England: Journal of Chinese Medicine Publications.
6. Ju-Yi, W. and J.D. Robertson, *Applied Channel Theory in Chinese Medicine* 2008, Seattle: Eastland Press.
7. Raheem, A., *Handbook for Clinical Acupressure: Basic Applications*, 2002, Soul Lightening Acupressure.
8. Harris, R.E., et al., *Using acupressure to modify alertness in the classroom: a single-blinded, randomized, cross-over trial*. *Journal of Alternative & Complementary Medicine*, 2005. **11**(4): p. 673-679.
9. Harris, R.E. and S.M. Zick, *Self-administered acupressure for treatment of persistent cancer-related fatigue*. *American Acupuncturist*, 2010. **54**: p. 16-17.
10. Shin, H.S., Y.A. Song, and S. Seo, *Effect of Nei-Guan point (P6) acupressure on ketonuria levels, nausea and vomiting in women with hyperemesis gravidarum*. *Journal of Advanced Nursing*, 2007. **59**(5): p. 510-519.
11. Dorsher, P.T., *The Neuroanatomic Basis of the Acupuncture Principal Meridians*, in *Nature Precedings* 2009, Department of Physical Medicine and Rehabilitation, Mayo Clinic: Jacksonville, FL.
12. Ahn, a.C., et al., *Electrical properties of acupuncture points and meridians: a systematic review*. *Bioelectromagnetics*, 2008. **29**(4): p. 245-256.
13. Lee, M.S., et al., *Differences in electrical conduction properties between meridians and non-meridians*. *The American Journal of Chinese Medicine*, 2005. **33**(5): p. 723-728.
14. Ahn, A.C., et al. *Electrical impedance of acupuncture meridians: The relevance of subcutaneous collagenous bands*. *PLoS ONE*, 2010. **5**, 9 pp.
15. Pearson, S., et al., *Electrical skin impedance at acupuncture points*. *Journal of Alternative and Complementary Medicine*, 2007. **13**(4): p. 409-418.
16. Hsiu, H., et al., *Differences in the microcirculatory effects of local skin surface contact pressure stimulation between acupoints and nonacupoints: possible relevance to acupressure*. *Physiol Meas*, 2010. **31**(6): p. 829-841.
17. Cho, S., et al., *MRI study of effect on brain activity according to stimulation method at LI11, ST36: Painful pressure and acupuncture stimulation of same acupoints*. *Journal of Alternative and Complementary Medicine*, 2010. **16**(4): p. 489-495.
18. Witzel, N., V., et al., *Differences in cortical response to acupressure and electroacupuncture stimuli*. *BMC Neurosci*, 2011. **12**: p. 73.
19. Stannard, D., *Pressure prevents nausea*. *Nursing Times*, 1989. **85**(4): p. 33-34.
20. Molassiotis, A., et al., *The effects of P6 acupressure in the prophylaxis of chemotherapy-related nausea and vomiting in breast cancer patients*. *Complementary Therapies in Medicine*, 2007. **15**: p. 3-12.
21. Suh, E.E. *The effects of P6 acupressure and nurse-provided counseling on chemotherapy-induced nausea and vomiting in patients with breast cancer*. *Oncology Nursing Forum*, 2012. **39**, E1-E9.

22. Roscoe, J.A., et al., *Acupressure bands are effective in reducing radiation therapy-related nausea*. Journal of Pain & Symptom Management, 2009. **38**(3): p. 381-389.
23. Roscoe, J.A., et al., *The efficacy of acupressure and acustimulation wrist bands for the relief of chemotherapy-induced nausea and vomiting: A University of Rochester Cancer Center community clinical oncology program multicenter study*. Journal of Pain and symptom Management, 2003. **26**(2): p. 731-741.
24. Shin, Y.H., et al., *Effect of acupressure on nausea and vomiting during chemotherapy cycle for Korean postoperative stomach cancer patients*. Cancer Nursing, 2004. **27**(4): p. 267-274.
25. Dibble, S.L., et al., *Acupressure for chemotherapy-induced nausea and vomiting: a randomized clinical trial*. Oncology Nursing Forum, 2007. **34**(4): p. 813-820.
26. Stainton, M.C. and E.J. Neff, *The efficacy of SeaBands for the control of nausea and vomiting in pregnancy*. Healthcare for Women International, 1994. **15**: p. 563-575.
27. Gurkan, O.C. and H. Arslan, *Effect of acupressure on nausea and vomiting during pregnancy*. Complementary Therapies in Clinical Practice, 2008. **14**(1): p. 46-52.
28. Norheim, A.J., et al., *Acupressure treatment of morning sickness in pregnancy: A randomised, double blind, placebo-controlled study*. Scandinavian Journal of Primary Health Care, 2001. **19**: p. 43-47.
29. Heazell, A., et al., *Acupressure for the in-patient treatment of nausea and vomiting in early pregnancy: a randomized control trial*. American Journal of Obstetrics & Gynecology, 2006. **194**(3): p. 815-820.
30. O'Brien, B., M.J. Relyea, and T. Taerum, *Efficacy of P6 acupressure in the treatment of nausea and vomiting during pregnancy*. American Journal of Obstetrics & Gynecology, 1996. **174**(2): p. 708-715.
31. Sinha, a., et al., *A randomised, double-blinded, placebo-controlled study of acupressure wristbands for the prevention of nausea and vomiting during labor and delivery*. Int. J. obstet Anesth, 2011. **20**(2): p. 110-117.
32. Belluomini, J., et al., *Acupressure for nausea and vomiting of pregnancy: a randomized, blinded study*. 1994. **84**(2): p. 245-248.
33. Harmon, D., et al., *Acupressure and prevention of nausea and vomiting during and after spinal anaesthesia for cesarean section*. British Journal of Anaesthesia, 2000. **84**(4): p. 463-467.
34. Stein, D.J., et al., *Acupressure versus intravenous metoclopramide to prevent nausea and vomiting during spinal anesthesia for cesarean section*. Anesthesia Analg., 1997. **84**(2): p. 342-345.
35. Ho, C.M., et al., *P6 acupressure does not prevent emesis during spinal anesthesia for cesarean delivery*. Anesth Analg., 2006. **102**(3): p. 900-903.
36. Windle, P.E., et al., *The effects of acupressure on the incidence of postoperative nausea and vomiting in postsurgical patients*. Journal of PeriAnesthesia Nursing, 2001. **16**(3): p. 158-162.
37. Schultz, A.A., et al., *Comparison of acupressure bands and droperidol for reducing post-operative nausea and vomiting in gynecologic surgery patients*. Applied Nursing Research, 2003. **16**(4): p. 256-265.
38. Barsoum, G., E.P. Perry, and I.A. Fraser, *Postoperative nausea is relieved by acupressure*. Journal of the Royal Society of Medicine., 1990. **83**(2): p. 86-89.
39. Lu, D.P. and G.P. Lu, *Clinical comparison of anti-emetic effect between acupuncture and acupressure for treatment of post-sedation nausea among dental patients*. Acupuncture & Electro-Therapeutics Research, 1998. **23**(1): p. 60-63.
40. Ming, J., et al., *The efficacy of acupressure to prevent nausea and vomiting in post-operative patients*. Journal of Advanced Nursing, 2002. **39**(4): p. 343-351.

41. Mirbagher-Ajorpaz, N., M. Adib-Hajbaghery, and F. Mossabi, *The effects of acupressure on primary dysmenorrhea: A randomized controlled trial*. *Complementary Therapies in Clinical Practice*, 2011. **17**(1): p. 33-36.
42. Chen, H.-M. and C.H. Chen, *Effects of acupressure at the Sanyinjiao point on primary dysmenorrhoea*. *Journal of Advanced Nursing*, 2004. **48**(4): p. 380-387.
43. Jun, E.-M., et al., *Effects of acupressure on dysmenorrhea and skin temperature changes in college students: A non-randomized controlled trial*. *International Journal of Nursing Studies*, 2007. **44**: p. 973-981.
44. Hjelmstedt, A., et al., *Acupressure to reduce labor pain: a randomized controlled trial*. *Acta Obstet Gynecol Scand.*, 2010. **89**(11): p. 1453-1459.
45. Kashanian, M. and S. Shahali *Effects of acupressure at the Sanyinjiao point (SP6) on the process of active phase of labor in nulliparas women*. *J Matern Fetal Neonatal Med.* , 2009.
46. Lee, M.K., S.B. Chang, and D.H. Kang, *Effects of SP6 acupressure on labor pain and length of delivery time in women during labor*. *Journal of Alternative and Complementary Medicine*, 2004. **10**(6): p. 959-965.
47. Sun, J.L., et al., *Effectiveness of acupressure for residents of long-term facilities with insomnia: A randomized controlled trial*. *International Journal of Nursing Studies*, 2010. **47**(7): p. 798-805.
48. Tsay, S.L. and M.L. Chen, *Acupressure and quality of sleep in patients with end-stage renal disease--a randomized controlled trial*. *International Journal of Nursing Studies*, 2003. **40**: p. 1-7.
49. Reza, H., et al., *The effect of acupressure on quality of sleep in Iranian elderly nursing home residents*. *Complementary Therapies in Clinical Practice*, 2009. **16**(2): p. 81-85.
50. Chen, M.L., et al., *The effectiveness of acupressure in improving the quality of sleep of institutionalized residents*. *Journal of Gerontology*, 1999. **54A**(8): p. M389-M394.
51. Maa, S.H., et al., *Effect of acupuncture or acupressure on quality of life of patients with chronic obstructive asthma: a pilot study*. *Journal of Alternative and Complementary Medicine*, 2003. **9**(5): p. 659-670.
52. Wu, H.S., et al., *Effectiveness of acupressure in improving dyspnoea in chronic obstructive pulmonary disease*. *Journal of Advanced Nursing*, 2004. **45**(3): p. 252-259.
53. Maa, S., *Acupressure as an adjunct to a pulmonary rehabilitation program*, 1996, University of Alabama at Birmingham. p. 152 p.
54. Tsay, S.L., et al., *Effects of acupressure therapy for patients having prolonged mechanical ventilation support*. *Journal of Advanced Nursing*, 2005. **52**(2): p. 142-150.
55. Felhendler, D. and B. Lisander, *Pressure on acupoints decreases postoperative pain*. *The Clinical Journal of Pain*, 1996. **12**(4): p. 326-329.
56. Hsieh, L.L., et al., *Treatment of low back pain by acupressure and physical therapy: randomised controlled trial*. *BMJ: British Medical Journal*, 2006. **332**(7543): p. 696-698.
57. Hsieh, L.L., et al., *A randomized controlled clinical trial for low back pain treated by acupressure and physical therapy*. *Preventive Medicine*, 2004. **39**(1): p. 168-176.
58. Hsieh, L.L., et al., *Effect of acupressure and trigger points in treating headache: a randomized controlled trial*. *Am J Chin Med*, 2010. **38**(1): p. 1-14.
59. Molassiotis, A., P. Sylt, and H. Diggins, *The management of cancer-related fatigue after chemotherapy with acupuncture and acupressure: a randomised controlled trial*. *Complementary Therapies in Medicine*, 2007. **15**(4): p. 228-237.
60. Zick, S.M., et al. *Relaxation acupressure reduces persistent cancer-related fatigue*. *Evidence-Based Complementary and Alternative Medicine*, 2011. **2011**.
61. Molassiotis, A., P. sylt, and B. Diggins, *The management of cancer-related fatigue after chemotherapy with acupuncture and acupressure: a randomised controlled trial*. *Complementary Therapies in Medicine*, 2007. **15**: p. 228-237.

62. Foubert, J., *Cancer-related anaemia and fatigue: assessment and treatment*. Oncology Nursing Forum, 2006. **20**(36): p. 50-56.
63. National Cancer Institute. *Coping with Cancer: Managing Physical Effects*. Available from: <http://www.cancer.gov/cancertopics/pdq/supportivecare/fatigue/HealthProfessional>.
64. Kang, H.S., S.R. Sok, and J.S. Kang, *Effects of meridian acupressure for stroke patients in Korea*. Journal of Clinical Nursing, 2009. **18**: p. 2145-2152.
65. Li, X., et al., *Effects of acupressure on lower limb blood flow for the treatment of peripheral arterial occlusive diseases*. Surgery Today, 2007. **37**: p. 103-108.
66. Lee, K.C., et al. *Effectiveness of acupressure on pruritis and lichenification associated with atopic dermatitis: a pilot trial*. Acupunct Med, 2011.
67. Wu, Y., et al., *Anemia and thrombocytopenia in patients undergoing chemotherapy for solid tumors: a descriptive study of a large outpatient oncology practice database, 2000-2007*. Clinical Therapeutics, 2009. **31**(2): p. 2416-2432.
68. Agarwal, A., et al., *Acupressure for prevention of pre-operative anxiety: a prospective, randomised, placebo controlled study*. Anesthesia, 2005. **60**: p. 978-981.
69. Heazell, A., et al., *Acupressure for the in-patient treatment of nausea and vomiting in early pregnancy: A randomized control trial*. American Journal of Obstetrics & Gynecology, 2006. **194**: p. 815-820.
70. Usichenko, T.I. and D. Pavlovic, *Suggesting the optimal control procedure for acupressure studies*. Anesthesia & Analgesia, 2003. **97**(4): p. 1196-1197.
71. MacPherson, H., et al., *Revised STandards for Reporting Interventions in clinical Trials of Acupuncture (STRICTA); Extending the CONSORT Statement.*, in PloS Med 20102010.