

The Effects of Stimulation of Acupuncture Points for the Treatment of Primary Dysmenorrhea

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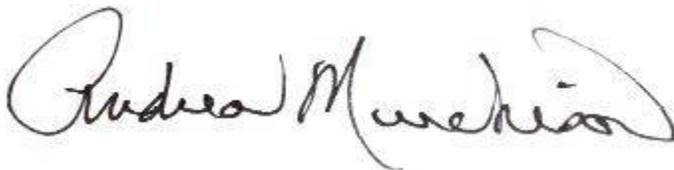
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Abstract

Dysmenorrhea, cramping pain that occurs with menstruation, affects more than half of all women of reproductive age. Up to 51% of women have been absent from school or work due to dysmenorrhea, and 5-14% of women frequently miss work due to dysmenorrhea. Experts recognize two types of dysmenorrhea. Primary dysmenorrhea, the most common type, is pelvic or lower abdominal pain without a specific pelvic pathology. Primary dysmenorrhea usually begins during adolescence. Secondary dysmenorrhea is menstrual pain related to pelvic pathology or uterine abnormality such as fibroids or endometriosis. The objectives of this research project were to determine if acupuncture is effective in the treatment of primary dysmenorrhea, identify which acupuncture points have been shown to be most effective in treating primary dysmenorrhea, and find at what point during a woman's cycle treatment should begin. To this end, the researcher conducted a qualitative systematic literature synthesis of studies that used acupuncture in the treatment of primary dysmenorrhea. Studies included women of reproductive age with primary dysmenorrhea who either received acupuncture or performed self-acupressure on acupuncture points on the main body. Results demonstrated that acupuncture is an effective treatment for pain associated with primary dysmenorrhea. It was unclear whether acupuncture before or during menstrual flow is more effective at resolving symptoms. The issue of treatment timing is an essential matter for future investigation.

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Chapter 1: Introduction

Dysmenorrhea is cramping pain that accompanies menstruation. According to the American College of Obstetricians and Gynecologists (2012), dysmenorrhea affects more than half of all women of reproductive age. The Guttmacher Institute (2014) reported that there were 62 million women of reproductive age in the United States, which means that in a given month, approximately 31 million American women experience dysmenorrhea.

It is estimated that for 20 percent of teenage women, the pain may be severe enough to affect their daily activities for one to three days of their menstrual cycle (Latthe, Champaneria, & Khan, 2011, p. 1). Previous studies have found rates of absenteeism from school due to dysmenorrhea of up to 46 percent among teenagers. Up to 51 percent of women have been absent from school or work due to dysmenorrhea at least once in their reproductive-age lives (Weissman, Hartz, Hansen, & Johnson, 2004, p. 345), and “10% to 15% of...adolescents complain of such severe pain that they are forced to take off time from school or work” (Yu, 2014).

An April 2013 paper from Columbia University entitled “Do Menstrual Problems Explain Gender Gaps in Absenteeism and Earnings?” analyzed evidence from the National Health Interview Survey on women between the ages of 18-55 regarding illness-related absenteeism from work. The authors found that women with menstrual problems have 2.2 more illness-related work day absences per year and earn 8% less income than women without menstrual problems. Afflicted women tend to be white or non-Hispanic and typically also suffer from premenstrual syndrome/premenstrual dysphoric disorder (PMS/PMDD), anxiety, and other health issues (Hermann & Rockoff, 2013). The April 2013 study also found that gynecology-related absences may account for up to 50% of a woman’s yearly sick days, time that could have

been spent at leisure or on increased productivity at work (Hermann & Rockoff, 2013). Dysmenorrhea clearly impacts a majority of the female population in the United States. Fortunately for this subgroup, the US has a constantly evolving medical field. Due to the growing acceptance of Traditional Chinese Medicine in Western societies, many women who suffer from dysmenorrhea have turned to acupuncture for relief from their symptoms. Amongst TCM practitioners, there is a wide range of techniques and approaches, each with its own merits.

The objective of this research project is to identify from the available research which acupuncture points are most effective in treating primary dysmenorrhea. In addition, I sought to determine at what point during the menstrual cycle acupuncture treatment for primary dysmenorrhea should begin. It is hypothesized that women who receive stimulation of classically used acupuncture points for primary dysmenorrhea will have a better result if they receive acupuncture or acupressure at least 72 hours before their menstrual flow begins.

Normal Physiology of the Menstrual Cycle

Humans are one of the few mammals that menstruate. Only our distant cousins, orangutans, have similar menstrual behavior to humans, with an average menstrual cycle of 28 days (Knott, 1999, pp. 50-57). Currently, there is no widely accepted evolutionary explanation for why women menstruate every month. The menstrual cycle involves interaction between the brain, ovaries and uterus, and is divided into four phases; the proliferative and secretory phases refer to stages of endometrial growth within the uterus, and the follicular and luteal phases refer to development of the follicle within the ovary.

The beginning of bleeding is considered the first day of the menstrual cycle. At this time, the brain releases hormones that stimulate a follicle to grow in the ovary. The growing follicle produces estrogen, which in turn stimulates proliferation of the lining of the uterus. This phase

of endometrial growth (which occurs simultaneously with follicular growth) is called the proliferative phase. The phase of follicular growth is called the follicular phase. The end of these earlier phases is designated as when the growing follicle gets large enough and then releases its egg; this is called ovulation.

At the time of ovulation, the ovarian follicle changes from primarily producing estrogen to primarily producing progesterone.

At this point, the ruptured follicle is now called the corpus luteum and the phase is called the luteal phase. At the same time, the progesterone causes the endometrial lining to change from a proliferative phase to a secretory phase. If pregnancy does not occur, the corpus luteum stops producing progesterone and the secretory endometrium sloughs off of the uterine wall in a process we call menstruation. The first day of bleeding is the beginning of the next cycle.

Primary Dysmenorrhea vs. Secondary Dysmenorrhea

There are two types of dysmenorrhea: primary and secondary. Primary dysmenorrhea, the most common type of dysmenorrhea, is pelvic pain or lower abdominal pain without a specified pelvic pathology. It usually begins during adolescence (Fritz & Speroff, 2011, p. 579).

Measurements of the prevalence of primary dysmenorrhea range from 20 to 90 percent of teenagers, depending on where the population of young women was sampled (French, 2005, p. 285). Primary dysmenorrhea is usually more prevalent among young women than older women. Secondary dysmenorrhea is menstrual pain that is due to a pelvic pathology or uterine abnormality such as fibroids or endometriosis (Fritz & Speroff, 2011, p. 579).

Biochemistry of Dysmenorrhea

Dysmenorrhea is typically caused by the production of a type of prostanoid (a fatty acid derived from arachidonic acid) called prostaglandins. Prostaglandins are chemical messengers

made by cells throughout the body, including in the inner lining of the uterus. The prostaglandins created in the uterus cause the uterine muscles to contract, which helps shed the uterine lining that has built up during the menstrual cycle (Harada, 2013). Excessive prostaglandin production may result in dysmenorrhea. The pain associated with primary dysmenorrhea usually occurs just before the onset of menstruation, as the levels of prostaglandins increase within the lining of the uterus. Prostaglandin levels are usually at their highest on day one of the cycle and typically taper off as the lining is shed (American College of Obstetricians and Gynecologists, 2012). In addition, prostaglandins can also cause headaches, nausea, vomiting, and diarrhea. However, it should be noted that some women have trouble distinguishing between menstrual cramps and gastrointestinal distress caused by fluctuations in their progesterone levels during their cycles. When the uterine lining is thickening and progesterone levels rise, some women experience constipation; if pregnancy does not occur and the uterine lining is sloughed off, progesterone levels drop, causing some women to experience diarrhea. Dysmenorrhea is usually treated with a medication prescribed by a woman's gynecologist or with over-the-counter medication. A 2007 Canadian survey of 291 adolescent women found that 93% reported menstrual discomfort during their last three menstrual cycles, and 70% of them had used over-the-counter medication to manage their discomfort; 17% had used prescription medication (Campbell & McGrath, 1997).

Types of Dysmenorrhea in TCM

Fu Qing Zhu Nu Ke (Fu Qing Zhu's Gynecology) is, according to its forward, "the single most important pre-modern Chinese text on *fu ke*, (or *nu ke*), or gynecology" (Fu, 1995, p. 40). *Fu Qing-zhu's Gynecology* was written during the 17th century in the early Qing dynasty (1644-1912) and was translated into English in 1989. Zhu identifies five Chinese Medical explanations

for dysmenorrhea (*tong jing*): (1) *liver qi stagnation* may cause premenstrual pain, (2) rebellious liver qi and blood may cause an unusual condition in which women vomit blood during menstruation (perhaps describing endometriosis), (3 and 4) cold and damp in the chong and ren channels might cause premenstrual pain just below the umbilicus, and (5) kidney deficiency might cause menstrual cramps following menstrual flow (Fu, 1995, p. 41-45).

Of these four, liver qi stagnation is by far the most common cause of dysmenorrhea. Liver qi stagnation can arise from emotional strain like anger, frustration, resentment, and/or stress (Maciocia, 1994, p. 735). Signs of liver qi stagnation are general mood changes like crying or irritability, breast tenderness before menstruation, large blood clots during menstruation, or bowel movement changes with menstruation. *Liver blood stagnation* may result from liver qi stagnation, because in TCM qi moves blood. Pelvic pain that is either stabbing or worse with pressure indicates *liver blood stagnation*.

Common Western Treatments for Dysmenorrhea

Non-steroidal anti-inflammatory drugs (NSAIDs) are a common over-the-counter or prescription treatment for women with menstrual pain and have a documented failure rate of 20-25% (Yu, 2014). Over-the-counter NSAIDs include aspirin, Advil, ibuprofen, Aleve, and Motrin. Naproxen, another NSAID, similar to Aleve, may also be prescribed by a doctor to treat menstrual pain (“Menstrual cramps,” 2008). Acetaminophen, also known by its brand name Tylenol, is not an NSAID. NSAIDs work by inhibiting cyclooxygenase (a type of prostaglandin), specifically COX-2, a key enzyme in inflammation that is expressed throughout the female reproductive system.

Some women treat menstrual pain with a combination of NSAIDs and hormonal contraceptives, such as the birth control pill, the hormone-releasing patch, or the vaginal ring

(French, 2005, p. 287). This “off-label” use of birth control prevents the formation of a thick uterine lining, which decreases the amount of prostaglandin made, thus decreasing the quantity and intensity of uterine contractions when the lining is shed. Other recommended options for women include heating pads, exercise, herbal therapy, nutritional changes, and even opioids. In addition, improvement over time is more likely in women who have given birth (Weissman, Hartz, Hansen, & Johnson, 2004, p. 345).

Side effects of Western treatments

A potential side effect of frequent NSAID use is gastritis or peptic ulcer formation. This is due to the different roles of prostaglandin throughout the body. Not only do prostaglandins play a role in inflammation and pain, but gastric prostaglandins are also involved in the production of mucus in the epithelial lining of the stomach. Through their inhibition of COX-1 and COX-2 (Cyclooxygenase), NSAIDs reduce production of prostaglandins and therefore decrease the production of protective mucus within the stomach and throughout the body. NSAIDs can also interact with numerous drugs, including anticoagulants, antiplatelet agents, antihypertensive, calcineurin inhibitors (cyclosporine and tacrolimus), digoxin, diuretics, glucocorticoids, lithium, selective serotonin reuptake inhibitors (SSRIs), methotrexate (MTX), and other medications (Simon, 2004). Consequently, a study found that about 54 percent of women discontinue the use of over-the-counter drugs in the first year of use, primarily due to side effects (Chao, Wade, Abercrombie, & Gomolak, 2014, p. 50).

Treating Primary Dysmenorrhea in Traditional Chinese Medicine

Gynecological health is very important to a patient’s over all diagnosis in TCM. During a standard intake a practitioner will ask if the woman suffers from menstrual cramps. If so, the follow-up questions will consist of the timing of the cramps in relationship to the onset of

menstruation and the nature of the pain, e.g., whether the pain is sharp, stabbing, or dull, whether or not there are blood clots and the size of those clots. Does she get constipated or have diarrhea with her menses? Does she have headaches before or after menstruation? These questions help the practitioner ascertain the underlying cause of her dysmenorrhea. There is no one-size-fits-all treatment, but there are main acupuncture points (Spleen 6, Spleen 8) that are used in almost every treatment, with the selection of other points depending on the cause of her dysmenorrhea.

Treatment for Liver *Qi* Stagnation

The main energetic intent behind the treatment of dysmenorrhea is to move *qi*. The acupuncture point selection for primary dysmenorrhea will often include two points: Spleen 6 (Sp6), *sanyinjiao*; and Large Intestine 4 (LI4), *hegu*. In Chinese Medicine, *sanyinjiao* is used to promote the flow of liver *qi*, regulate the uterus and menstruation, move blood, and eliminate stasis (Maciocia, 1994, p. 394). *Hegu* is used to stop pain in the body by calming muscles and is said to have an anti-spasmodic action for treatment of intestinal spasms and uterine cramps. It is also used to remove obstructions in channels, like *qi* stagnation.

Other points used are Ren 6 (R6), *qihai*, which regulates and harmonizes blood, and treats uterine bleeding disorders such as dysmenorrhea (Deadman, Baker, & Al-Khafaji, 1998, p. 505). Gallbladder 34 (GB34), *yanglingquan*, spreads liver *qi*, alleviating liver *qi* stagnation (Deadman, Baker, & Al-Khafaji, 1998, p. 451). Liver 3 (LV3), *taichong*, regulates menstruation by spreading liver *qi* (Deadman, Baker, & Al-Khafaji, 1998, p. 477). Spleen 8 (Sp8), *diji*, regulates menstruation and invigorates blood (Deadman, Baker, & Al-Khafaji, 1998, p. 193). Spleen 10 (Sp10), *xuehai*, invigorates the blood, dispels stasis, cools blood, and harmonizes menstruation (Deadman, Baker, & Al-Khafaji, 1998, p. 196). Stomach 29 (St29), *guilai*, regulates menstruation and benefits the genital region by moving *qi* (Deadman, Baker, & Al-

Khafaji, 1998, p. 151). Lung 7 (Lu7), *lieque*, opens and regulates the Ren Mai meridian, also called the conception vessel (Deadman, Baker, & Al-Khafaji, 1998, p. 84). Kidney 6 (K6), *zhaohai*, regulates the lower *jiao* and through this regulation effects irregular menstruation (Deadman, Baker, & Al-Khafaji, 1998, p. 345).

Treatment for Liver Blood Stagnation

Liver blood stagnation may be treated with a point prescription similar to that used for liver qi stagnation: Liver 3, Ren 6, Large Intestine 4, Gallbladder 34, Spleen 8, Stomach 29, Spleen 10, Spleen 6, Lung 7, and Kidney 6. In addition, Spleen 4 (Sp4), *gongsun*, may be included in this prescription to regulate the penetrating vessel (the Chong Mai meridian), which is the Sea of Blood and thus responsible for menstruation (Deadman, Baker, & Al-Khafaji, 1998, p. 186). Pericardium 6 (P6), *neiguan*, may also be prescribed to help regulate menstruation by clearing heat (Deadman, Baker, & Al-Khafaji, 1998, p. 377).

Treatment for Stagnation due to Cold

A classic treatment by Giovanni Maciocia (1994) for stagnation of cold would include Ren 4, Ren 6, Stomach 29, Spleen 8, Spleen 6, and Stomach 36 with the application of moxibustion (Chinese mugwort, *Artimesia vulgaris*), used for its smoke to warm the body and remove stagnation.

Treatment for other Deficiencies

There are two types of deficiency associated with dysmenorrhea, either qi and blood deficiency or deficiency of liver and *kidney yin*. Treatment of *qi and blood deficiency* would include Ren 4, Ren 6, Stomach 36, Spleen 6, Spleen 8, and Urinary Bladder 20. Treatment of kidney and liver yin deficiency will use Urinary Bladder 23, Urinary Bladder 18, Ren 4, Spleen 6, Kidney 3, Kidney 6, Lung 7, and Stomach 36.

Chapter 2: Literature Review

Acupuncture and Acupressure studies conducted in the past several decades test the effects of acupuncture on dysmenorrhea following one of two different protocols. In the first protocol, the patient received acupuncture beginning on the first day of her menstrual flow. In the second protocol, known as preconditioning acupuncture, patients received acupuncture a few days to more than a week before menstruation was expected. In the second protocol, women could also received acupuncture for a more protracted length of time, often for several months. In both of the protocols, patients usually received acupuncture or acupressure at Spleen 6 and Spleen 8. Other points used includes Urinary Bladder 32, Liver 3, Ren 4, Large Intestine 4, and *shiqizhui*. The details regarding the selection and qualifications of studies used can be found in chapter 3 (Methodology).

Acupuncture Points Used on the First Day of Menstrual Flow

In 2012, Gharloghi et al. performed a crossover clinical trial at Sarpolezahab Health Center in Iran. In the study, 42 women between the ages of 18 and 30 who suffered from primary dysmenorrhea performed self-acupressure on Spleen 6 or Spleen 8 (Gharloghi, Torkzahrani, Akbarzadeh, & Heshmat, 2012, p. 137). This was one of the first studies that compared the efficacy of these two acupuncture points. The study took place over three months during the first three days of menstrual flow. The women were only actively observed during the first month of self-acupressure. During the second month, each participant was put either into Group A for stimulation of Spleen 6 or Group B for stimulation of Spleen 8. During the third month, the groups switched acupressure points. The participants were shown how to stimulate either of the two points in alternating increments of five minutes on the medial side of lower leg for a total of 20 minutes a day for three days, beginning on the first day of menstrual flow. This

took place during two consecutive menstrual cycles. Results were compared using the McGill pain index before menstruation and during the first 30 minutes, 60 minutes, and 120 minutes of their menstrual flow. The study found that treatment at Spleen 6 and Spleen 8 both decreased pain, but treatment at Spleen 8 reduced pain substantially more than Spleen 6 did. The investigators concluded that Spleen 8 could be considered “an emergency point” for the treatment of primary dysmenorrhea (Gharloghi, Torkzahrani, Akbarzadeh, & Heshmat, 2012, p. 141).

A 2009 study on the effects of acupressure on Spleen 6 at a nursing school in Hong Kong used three different techniques to collect data on pain: the PVAS (see Figure 2), the McGill pain questionnaire (see Figure 1), and the short-form Menstrual Distress Questionnaire (Wong, Lai, & Tse, 2010, p. 64). The study examined 40 women between the ages of 18 and 30 whose dysmenorrhea symptoms had increased since menarche. Researchers instructed patients to perform self-acupressure during the first 24 hours of their menstrual flow, pressing the point for 15 seconds on and off for 20 minutes, over three menstrual cycles. The acupressure proved not just to be a palliative on the day of menstrual flow, but with each successive cycle patients experienced decreased overall pain. The study validated the role that Spleen 6 can play in alleviating primary dysmenorrhea and underlined the convenience of self-acupressure.

A University of California, San Francisco study compared the efficacy of alleviating primary dysmenorrhea by injecting vitamin K into Spleen 6 with the efficacy of injecting vitamin K into a single non-acupuncture point during the first two days of a woman’s menstrual cycle over the course of two months. Nurse practitioners administered the injections into 20 women between the ages of 18 and 25. While Vitamin K injection is not a standard TCM treatment, this study did prove that patients experienced a greater decrease in pain intensity and duration of pain

when they received Vitamin K-based injections in Spleen 6 than when they received the same injections in the non-acupuncture point (Chao, Wade, Abercrombie, & Gomolak, 2014, p. 49).

At the Affiliated Hospital of Shangdong University, a two-part comparison involving 600 women was performed using different timed protocols as well as a different acupuncture point, *shiqizhui* (Ma et. al., 2013), compared to a multi-point treatment. *Shiqizhui* is an infrequently used point and is not part of the 12 main acupuncture meridians. It is located on the back near lumbar vertebra 5. Due to *shiqizhui*'s geographical location on the lower back near the pelvis, it has a documented effect on gynecological conditions. In the study, Ma et al. (2013) treated one group of patients that consisted of 100 women by stimulating *shiqizhui* just as menstruation began for the first three days of menstrual flow. They treated the other group of patients, also 100 women, with multi-point stimulation of Spleen 6, Spleen 8, Urinary Bladder 32, and *shiqizhui* just before menses began. Treatment was received for three consecutive menstrual cycles. While both groups experienced diminished pain, the group that received acupuncture with multiple-point selection experienced greater improvement overall during the three-month period of treatment, while those that received just stimulation of *shiqizhui* experienced the more immediate decrease in pain.

Yu et al. (2010) compared stimulation of two points, Spleen 6 and Gallbladder 39, on a sample of 66 women. One group of patients received acupuncture at Spleen 6 with five-minute retention on the first day of menstrual flow. The control group received acupuncture at Gallbladder 39 under similar conditions. After the five-minute needle retention the women were assessed for pain levels. Based upon the results, the researchers concluded that acupuncture at Spleen 6 alleviated pain associated with primary dysmenorrhea in a way that acupuncture at Gallbladder 39 did not.

Acupuncture Points at Least 72 Hours Before Menstruation

The second part of the study done by Ma et al. (2013) involved the stimulation of acupuncture points five days before menses began. The same point selection was compared. One group of 100 women stimulated the *shiqizhui* acupuncture point, while the second group of 100 women underwent multi-point stimulation of Spleen 6, Spleen 8, Urinary Bladder 32, and *shiqizhui*. Treatment was continued for three consecutive menstrual cycles. While both groups experienced diminished pain, the group that received acupuncture with multi-point selection experienced greater improvement overall during the three-month period of treatment, while those who received just stimulation of *shiqizhui* received the more immediate decrease in pain. Compared to the study done on the first three days of the menstrual cycle, women receiving acupuncture days before their flow experienced a greater decrease in dysmenorrhea than those who received either single- or multi-point acupuncture on the day of their menstrual flow.

A 2002 Iranian study, using the verbal multidimensional scoring system to measure pain, compared the effects of acupressure vs. ibuprofen on primary dysmenorrhea (Pouresmail & Ibrahimzadeh, 2002, p. 205). The study included 216 women between the ages of 14 and 18 who were all taught self-acupressure on Large Intestine 4, Spleen 6, Spleen 15, Stomach 36, and Liver 3. The researchers instructed one set of patients to begin self-acupressure 24 hours before their menstrual flow was anticipated in two-minute increments on the selected points. A second set of patients took ibuprofen for three days before their flow was anticipated. The study found that acupressure 24 hours in advance was just as effective as taking NSAIDs for three days before menstruation (Pouresmail & Ibrahimzadeh, 2002, p. 205).

A 2012 Chinese study explored whether the act of actually triggering the “qi sensation,” *de-qi* or *da-qi*, with the acupuncture needle, or merely the psychosomatic effect of receiving

acupuncture, made acupuncture effective in treating primary dysmenorrhea (Xiong, Zhang, Wang, & Huang, 2011, p. 7). The study treated 120 women by needling Spleen 6, Stomach 36, and Ren 3, beginning on day five or seven of the menstrual cycle and continuing for five consecutive days. The needles were stimulated every five minutes to maintain the *de-qi* sensation. This protocol continued for three menstrual cycles. The study found that patients who received greater needle manipulation to get *de-qi* had greater pain relief.

A study by Bu, Du and Chen (2011) at Shandong Academy of Chinese Medicine in China compared three different groups of women for three months who either: (1) received no acupuncture and were only observed; (2) received acupuncture at Spleen 6, Urinary Bladder 32, and Spleen 8 about an hour before menstruation; or (3) received acupuncture three to seven days leading up to their menstrual flow. For the two groups who received acupuncture, the *de-qi* or *da-qi* sensation was achieved. By the third month of treatment, the authors of this study felt that there was a correlation between acupuncture and a decrease in dysmenorrhea, and more research on this topic by this author is forthcoming.

A Turkish study conducted between 2002 and 2005 compared the efficacy of acupuncture to that of NSAIDs in the treatment of primary dysmenorrhea (Kiran et al., 2013, p. 293). The study treated 35 women with a wide range of acupuncture points: Heart 7, Pericardium 6, Large Intestine 4, Large Intestine 10, Spleen 6, Liver 3, Stomach 36, *Zi Gong Xue*, Gallbladder 26, and Spleen 15. Gallbladder 26 and Spleen 15 are not generally considered to have a direct effect on gynecological issues, but may have been selected because of their physical proximity to the uterus. Patients rated their pain using the VAS scale, and received acupuncture once a week for eight weeks. In administering acupuncture, researchers attempted to achieve the *de-qi* sensation, although doing so was not a focus of the study. The researchers concluded that acupuncture

three or more times during a woman's menstrual cycle was as effective as NSAID therapy in alleviating pain from primary dysmenorrhea.

Chapter 3: Methodology

The purpose of this research synthesis was to ascertain whether the stimulation of acupuncture points decreased the pain experienced by women suffering from primary dysmenorrhea. This chapter highlights the research methods used to determine those points and the clinical procedures utilized to accomplish the objective.

General Statement of Methodology

This study was a qualitative systematic literature synthesis. This type of study focuses the intent of the researcher on synthesizing all of the research used in order to test the hypothesis. It was important to perform a qualitative study rather than a quantitative study because of the subjective nature of describing the intensity of pain and its different qualities (e.g., stabbing, dull, sharp, throbbing), and the difficulty of interpreting improvement in pain.

Sampling Procedures

In the 2014 research process the terms “primary dysmenorrhea” was searched with “acupuncture” on the search engine PubMed, from which 93 articles were found. Using the search terms “primary dysmenorrhea” and “acupressure” yielded 26 articles. “Primary dysmenorrhea” was also searched with “prostaglandin” and “acupuncture” which yielded 12 articles. “Primary dysmenorrhea” and “electro-acupuncture” were searched together and yielded four studies. “These peer-reviewed medical journal articles were accessed via PubMed, EBSCO, Google Scholar, or the Wiley Online Library. Of these 135 total articles, three were dismissed from the “acupuncture” results because they involved the use of auricular acupuncture. Another 25 “acupuncture” studies were eliminated because they involved the use of moxibustion, herbal therapy or unusual acupuncture needling practices. All four electro-acupuncture studies were left

out to keep the studier more focused on just acupuncture and acupressure. This left 103 articles on treating dysmenorrhea with acupuncture or acupressure that met the criteria for consideration.

Of the remaining 103, 93 of them were rejected due to incomplete documentation of acupuncture point selection, length of treatment or timing of treatment. Ultimately, a total of 10 studies were useable in their entirety. Of those 10, 4 studies explored acupuncture/acupressure performed only on the day menses began, 5 studies explored acupuncture/acupressure only before menses began and 1 study evaluated treatment on both the day of menstruation and before menstruation. Four articles addressed the use of Spleen 8, which is the empirical point for dysmenorrhea in TCM.

Inclusion criteria. Only studies that met all of the following criteria were used: studies published in peer reviewed journals, studies of women of reproductive age, studies of women with primary dysmenorrhea, and studies with either manual acupuncture or acupressure on acupuncture points located on the main body (as opposed to Korean hand acupuncture points or auricular acupuncture), studies with clear documentation of protocol and points utilized

Exclusion criteria. Studies meeting any of the following criteria were excluded: studies older than 1997 (to ensure that chosen studies were available in complete manuscript form and were readily available through electronic databases), non-peer-reviewed studies, studies involving women with a history of secondary dysmenorrhea, studies involving women who were not suffering from dysmenorrhea at the time, studies with auricular acupuncture, studies that lasted less than three months, animal studies, studies involving herbal medicine as a comparison, and studies with electro-stimulation. Other studies were excluded because they lacked essential documentation such as acupuncture methodology.

Data Analysis

Content and thematic analyses, two of the most common forms of analysis in qualitative research, were used to analyze the data. The analysis included frequency of themes, or measurements of improvement of pain relief reported in collected studies, and the most common acupuncture points used in collected studies. Data were collected and analyzed according to the researcher's abstraction form, with predetermined inclusion and exclusion criteria.

Human Research Ethical Considerations

No informed consent was needed for this research synthesis as this was a literature review and there was no interaction between researchers and subjects. There were no risks to the privacy because the studies' already-anonymized the participants, and the burden of privacy and ethics was incumbent upon the original researchers.

Chapter 4: Results

This chapter collates the results of the studies discussed in the literature review. It focuses on summarizing the efficacy of acupuncture/acupressure at least 72 hours before menses and acupuncture/acupressure only after menses has begun. The information was gathered based upon the inclusion/exclusion guidelines set forth in chapter 3. The researcher paid special attention to the clarity of each study after information was abstracted, and some studies that initially fit the abstraction form were later removed for having vague results.

Studies on Acupuncture and Acupressure on First Day of Menstrual Flow

In the five studies used, the total number of women who participated was 368. The acupuncture/acupressure points used were Large Intestine 4, Spleen 6, Spleen 8, Spleen 15, Stomach 36, Liver 3, Ren 3, and Urinary Bladder 32. All 5 of the studies demonstrated that acupuncture performed on the first day of menstruation was effective in reducing the symptoms of primary dysmenorrhea.

Table 1. Studies of treatments performed on first day of menstruation

Name	Date	Number of Participants	Methodology	Acupuncture points	Findings
Gharloghi et al.	2012	42	Self-acupressure	Spleen 6, Spleen 8	Both points effective for up to two hours following treatment ($P < 0.001$); Spleen 6 more effective ($P = 0.004$).
Wong et al.	2009	40	Self-acupressure	Spleen 6	Statistically significant decrease in pain score for PVAS ($p = 0.003$) and SF-MPQ ($p = 0.02$) immediately after 20

					min of SP6 acupressure. Self-acupressure applied to SP6 for three consecutive months also effective (PVAS pain reduction, $p = 0.008$; SF-MPQ pain reduction, $p = 0.012$).
Chao et al.	2014	20	Inject vitamin K into Spleen 6 vs. inject vitamin K into non-acupuncture point	Spleen 6	Vitamin K1 injection in SP6 more effective than Vitamin K into non-acupuncture point. A 2.5 point decrease in pain, and approached statistical significance with a score of ($p < 0.100$).
Yu et al.	2010	66	Acupuncture at Spleen 6 vs. Gallbladder 39	Spleen 6, Gallbladder 39	Spleen 6 reduced menstrual pain five minutes after treatment ($p < 0.001$).
Ma et al.	2013	200	Acupuncture at <i>shiqizhui</i> vs. multi-point acupuncture	Spleen 6, Spleen 8, Urinary Bladder 32, and <i>shiqizhui</i>	Multi-point acupuncture more effective long term ($p < 0.05$); <i>shiqizhui</i> more effective short term ($p < 0.01$).

Table 1. Studies of treatments performed on first day of menstruation

Studies on Acupuncture and Acupressure in the Days Leading Up to Menstruation

Five studies in which patients received acupuncture in the days leading up to menstruation were reviewed. The total number of women who participated in the five studies was 651. The acupuncture points used were Spleen 6, Spleen 8, Gallbladder 39, Urinary Bladder 32, and *shiqizhui*. Of the points compared, Spleen 6 showed improved symptoms in every study it was used.

Table 2. Studies performed prior to menstruation

Name	Date	Number of Participants	Methodology	Acupuncture points	Findings
Ma et al.	2013	200	Acupuncture at <i>shiqizhui</i> vs. multi-point acupuncture	Spleen 6, Spleen 8, Urinary Bladder 32, and <i>shiqizhui</i>	Multi-point acupuncture more effective long term ($p < 0.05$); <i>shiqizhui</i> more effective short term ($p < 0.01$).
Pouresmail et al.	2009	216	Self-acupressure	Large Intestine 4, Spleen 6, Spleen 15, Stomach 36, and Liver 3	Acupressure for 24 hours was just as effective as taking NSAIDs for three days before menstruation ($p < 0.0001$).
Xiong et al.	2012	120	Acupuncture with <i>de-qi</i> sensation vs. without <i>de-qi</i> sensation	Spleen 6, Stomach 36, and Ren 3	Acupuncture with <i>da-qi</i> more effective than without <i>da-qi</i> ($p < 0.01$).
Bu et al.	2011	80	Acupuncture	Spleen 6, Urinary Bladder 32, and Spleen 8	Acupuncture effective three to seven days before menstruation ($p < 0.01$).
Kiran et al.	2005	35	Acupuncture	Heart 7, Pericardium 6, Large Intestine 4, Large Intestine 10, Spleen 6, Liver 3, Stomach 36, <i>Zi Gong Xue</i> , Gallbladder 26, and Spleen 15	Acupuncture three or more times during a woman's menstrual cycle was as effective as NSAID therapy ($p < 0.05$).

Studies on Timing of Acupuncture and Acupressure Treatment

Ten studies considered the effects of acupuncture and acupressure at different times in the menstrual cycle. While all studies demonstrated a positive effect on primary dysmenorrhea, there was no clear relationship between timing of initiation of treatment and overall benefit. While it is likely that a certain point in the menstrual cycle might be more effective than another for treating primary dysmenorrhea, there have not been any quality studies that have compared these variables. Therefore, it is not clear when the best time in the menstrual cycle is to treat patients for primary dysmenorrhea.

Summary

Based on the collected studies, multi-point acupuncture is more effective than single point acupuncture in treating primary dysmenorrhea. Treatment before menstruation was no more effective than treatment during or after menstruation. Taking into account the combined successful outcome of the 10 studies considered herein, the most effective treatment would involve multiple-point stimulation including Spleen 6 and Spleen 8. Furthermore, although it does not bear directly on the considerations of timing and point selection that are the focus of this paper, it is worth noting that the collected studies suggest that the effectiveness of acupuncture treatment for primary dysmenorrhea can be enhanced by achieving *da-qi*. The women in the collected studies had symptoms that decreased over time, and the care was not just palliative, as they improved over the course of six weeks to three months.

Chapter 5: Discussion

Due to the wealth of positive information regarding the efficacy of acupuncture for treating dysmenorrhea, it is reasonable to hope that women will use the stimulation of acupuncture points either through manual self-acupressure or through care from a licensed acupuncturist as an alternative to the commonly used treatments currently available. Because there is a positive result regardless of when in the menstrual cycle this stimulation occurs, it is possible that all women will be able to soothe their discomfort.

Implications for Practice

The points selected in the various studies are well known to most practitioners, largely because these classic point prescriptions can be found in well-known academic textbooks such as *Chinese Acupuncture and Moxibustion* and *A Manual of Acupuncture*, respectively known as “CAM” and “Deadman” by students. Having consistent clinical evidence of the efficacy of these points should encourage practitioners to reach out to their female patients regarding dysmenorrhea. If it is not already included on a new patient intake form, then the question of pain during menstruation should be added. Treating dysmenorrhea is clearly in the scope of an acupuncturist’s practice, and more attention should be brought towards this treatable condition.

Based on these studies, practitioners seeking to treat patients for primary dysmenorrhea should certainly include acupuncture of Spleen 6 and Spleen 8 in their treatment protocols, as numerous studies found these two points to be consistently effective in treatment. Practitioners might also consider including *shiqizhui* in their primary dysmenorrhea protocols, which one study found to have a more immediate effect than a multi-point protocol in alleviating pain from primary dysmenorrhea—although it is worth noting that *shiqizhui*, unlike Spleen 6, Spleen 8, and

the other acupuncture points discussed herein, is on the patient's back, so incorporating *shiqizhui* requires the practitioner to do a second treatment with the patient lying on her belly.

The timing in the menstrual cycle of treatment for primary dysmenorrhea is another element of a treatment protocol that the researcher had hoped to clarify in through this research. However, the studies reviewed herein provide no clear "best time" to treat primary dysmenorrhea with acupuncture. On the other hand, all of the studies considered in this literature review found acupuncture or acupressure to have at least some positive effect on primary dysmenorrhea, regardless of when in the menstrual cycle the patient received treatment. Therefore, perhaps the best advice for practitioners is to treat patients suffering from primary dysmenorrhea whenever possible, with the understanding that at least some positive effect is likely.

Limitations of the Current Study

There have been many studies performed over the last 40 years on the use of acupuncture to treat primary dysmenorrhea. Most often these studies find positive results for acupuncture, but from the point of view of the acupuncturist they leave something to be desired, with replicable results that often seem at odds with classical point-selection training. Past studies on pain management have often involved using sham acupuncture as a placebo. Recently, sham acupuncture studies have come to be viewed as invalid because of varying acupuncture point locations per patient and the use of *ashi* points in the treatment of pain (Upchurch, 2014). Even recent studies reference older articles, at least ten years in the past (Sternfeld, Swindle, Chawla, Long, & Kennedy, 2002). Modern studies should be able to use newer statistics on absenteeism due to dysmenorrhea, and aside from the 2013 study published by Columbia University, the researcher could not find any.

Several studies of the effect of acupuncture on primary dysmenorrhea are omitted from this analysis because they failed to adequately document their acupuncture methodology. A German study by Witt, Brinkhaus, Roll, Jena, and Wilich (2008) analyzed the cost-effectiveness of treating primary dysmenorrhea with acupuncture and treated women for three months, but the researchers left the acupuncture point selection up to practitioners and did not document which acupuncture points were used.

A recent Chinese study (Liu et al., 2014) was vague about when in the menstrual cycle researchers administered the acupuncture. Also, the study used Gallbladder 39 as a control point despite the fact that this point has a documented effect in alleviating muscle spasms, which might ease uterine contractions and thus alleviate pain associated with primary dysmenorrhea.

Therefore, the researcher believes the use of this point as a control tainted and invalidated the study's results. The study would have been better served by selecting a control point that was certain not to effect symptoms related to primary dysmenorrhea, such as *bitang*, which alleviates allergies and nasal congestion. Another study comparing Spleen 6 to Gallbladder 39 was similarly unusable because of the possibility of Gallbladder 39 being an effective point for the treatment of primary dysmenorrhea (Chen, Chien, & Liu, 2013). Another thorough study from the Iranian School of Midwifery on acupressure on Liver 3 was unusable because, despite the details in the study, it was vague as to when in the women's cycles acupressure was performed.

The researcher would like to see future research focus on comparisons of different acupuncture protocols in their effectiveness for treating primary dysmenorrhea. The studies considered herein generally focused on investigating whether or not acupuncture could be effective in treating primary dysmenorrhea, rather than investigating what acupuncture protocol might be most effective in doing so. Ideally, future research would focus on different

combinations of acupuncture points and different timings of treatment during the menstrual cycle. This future research would aid in strengthening the validity of acupuncture as part of modern medicine in the United States.

Medical Insurance Policy Implications

Acupuncture is a covered service by a number of health insurance companies in the United States. With the passage of the Affordable Care Act (ACA), California, Maryland, Washington, and New Mexico chose to have acupuncture considered an essential health benefit and is covered by all individual and small-group plans located within the state. At least 13 states chose to have acupuncture covered on state employee policies. Unbeknownst to many insurance consumers, acupuncture can often be restricted by diagnosis code. Coverage can limit acupuncture to the treatment of osteoarthritis, low back pain, or in lieu of anesthesia. Sometimes diagnosis restrictions are selected by the human resource department of a business; other times they are part of the standard coverage offered by the insurance company. Using acupuncture for the treatment of dysmenorrhea by most insurance companies is considered experimental and is often not covered.

Aetna health insurance, one of the largest managed care companies in the United States, per their own clinical policy guideline 0135, “considers acupuncture experimental and investigational” for almost all diagnoses “because there is inadequate scientific research assessing the efficacy of acupuncture compared with placebo, sham acupuncture or other modalities of treatment in these conditions.” With the research done in this capstone and the current changes to healthcare coverage, it is hoped that insurance companies and non-acupuncture practitioners will see that there is adequate scientific research to consider covering and prescribing the use of acupuncture for the treatment of dysmenorrhea.

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