The Efficacy of Dang Gui Shao Yao San for the Treatment of Primary Dysmenorrhea

By

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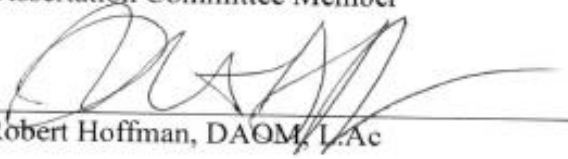

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Abstract

Dang Gui Shao Yao San (DSS) is a traditional Chinese herbal medicine (CHM) that has been used historically for the treatment of primary dysmenorrhea. The purpose of this study is to determine the efficacy of DSS as a possible treatment approach for primary dysmenorrhea. This study involved a systematic review of 25 relevant studies 13 of which were randomized controlled trials (RCTs) that used DSS for the treatment of primary dysmenorrhea. Both qualitative and quantitative data methods were used to score the efficacy of DSS. This Meta-analysis and systematic review provided sufficient evidence suggesting the efficacy and success of DSS in the alleviation of dysmenorrhea symptoms. This research concludes that the Chinese herbal medicine DSS, which was originally believed to ameliorate abdominal pain, is capable of efficiently helping women recover from dysmenorrhea symptoms quicker than any other intervention, and has no side effects as observed in other CHMs used to treat the same symptoms.

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Chapter 1: Introduction

According to modern statistics, women have menstrual periods for an average of about 40 years throughout their lives. Dysmenorrhea is the most common issue among the many health problems derived from menstrual syndrome. The term "Dysmenorrhea" indicates pain that occurs before, during or after menstruation. The pain may occur in the lower abdomen or sacral region and sometimes extend to the legs. In severe cases, there may be nausea and vomiting or even fainting. The adolescents with dysmenorrhea range from 60% to 93%, while the most severe dysmenorrhea ranges from 36% to 52.5% (Jiang, et al., 2019) In the treatment of Western medicine, oral nonsteroidal analgesics (NSAIDs) are often the mainstay. Although the pain is temporarily relieved, it often recurs and but have many side effects. (Morrow C. & Naumburg EH, 2009) Dysmenorrhea is a cyclical problem. If you can grasp the physique caused, and then provide appropriate Chinese medicine prescriptions, it may be a good way to respond.

Chinese herbal medicines have now become one of the interests of medicine, pharmacology, and agricultural biotechnology worldwide. According to several versions of ancient pharmacopoeia, Chinese herbal medicine is usually composed of 3–5 herbs in a formula or prescription for treatment of illness, according to several versions of ancient pharmacopoeia. Despite the fact of a long history of human use, a clinical trial for establishing evidence-based medicine has been thought essential. The records of the dysmenorrhea names in the traditional Chinese medicine books appear first in in 200 BC. The description and treatment of its symptoms are also found in that era.

“Essential Prescriptions of the Golden Cabinet” Jin Gui Yao Lue is known as "the ancestor of clinical gynecology" during the Eastern Han Dynasty (Leem et al. 2019), presenting Gynecological diseases are difficult and complex. The three chapters on the treatment of women in the book have

both theoretical elaboration and clinical experience records, which are highly praised by clinicians. Dang Gui Shao Yao San (DSS) has been commonly used clinically to treat dysmenorrhea, menstrual abnormalities, irregular menstrual cycles, Amenorrhea, Leucorrhea, and many other gynecological disorders for thousands of years. In modern China, DSS is widely used to alleviate these types of symptoms.

Primary Dysmenorrhea in Western Medicine

The term "dysmenorrhea" originated in Greece and stands for menstrual difficulties (Mazson & Rosenwaks, 2000), which indicates pain that occurs before, during or after menstruation. The pain may occur in the lower abdomen or sacral region and sometimes extend to the leg. In severe cases, there may be nausea and vomiting or even fainting. There are two types of dysmenorrhea. The first one is Primary dysmenorrhea. It's also known as functional disorder. The other one called Secondary dysmenorrhea which means pain causes by disorder in the woman's reproductive organs, such as endometriosis or Pelvic Inflammatory Disease (PID).

This study is focused on Primary dysmenorrhea. It's mainly occurred due to excessive contraction of the uterine muscle layer and caused uterine ischemia. Although the etiology of the cause is still not clear, it is generally explained that the endometrial cells release prostaglandins (PGF2α & PGE_2) to produce free radicals that cause the uterus to contract, and then the uterine blood flow decreases to increase the sensitivity of pain fibers. The following summarizes the factors that Western medicine believes are closely related:

1. Cervical occlusion: If the cervix is too narrow, the endometrium is not easy to discharge, or if the channel is blocked by blood clots, then that can cause uterine contractions and pain (Brown, 1982)
2. Prostaglandins (PGs): active lipid substances that contract uterine muscle fibers can be found during menstruation. They are the highest in the endometrium and mainly contain PGF2α & PGE_2. The former can inhibit uterine contraction and relax the uterus. It causes contraction and increasing tension while the latter stimulates uterine muscles. Women have twice to four times more than women without dysmenorrhea.
3. Arginine Vasopressin, AVP: Myometrium small blood vessels are more sensitive to AVP. It is thicker than blood vessels. The role of AVP is to cause increased uterine myometrium vitality and uterine contraction, which causes uterine ischemia and pain. Women with dysmenorrhea are more sensitive to AVP.
4. Endorphin(β-EP): It is considered to be a neurohormone related to pain, (Zhong guo, 2008), which is responsible for the regulation of uterine function. When in the luteal phase, β-EP will decrease and lead to abnormal uterine activity, which becomes one of the causes of pain.
5. Other factors: Calcium plays a critical role of fertilization. (Sakineh M. C, et al., 2017). Many lifestyle factors such as Psychology, stress, early menstrual age, smoking and obesity can greatly influence the role of calcium in fertilization. (Dawood, 1985).

Primary Dysmenorrhea in TCM

In ancient China, menstruation was called “lunar water” or “lunar event”, it is related to excretion, adjusted by Ren Mai and Chong Mai. Ren Mai is responsible for saving yin blood. When yin blood is rich in ovaries, it will become menstrual blood. Chong Mai is important to regulate menstruation and reproduction. Ren Mai and Chong Mai are only meridians without organs, but because they are close to liver and spleen, they cannot function independently.

The function of liver storing blood has a marked influence on menstruation relevance in clinical practice. When there is deficiency of liver blood, it will lead to be amenorrhea or scanty periods; when liver blood is stagnant, it will cause painful periods with dark blood clots and premenstrual tension. The liver ensures the smooth flow of Qi (Shu Xie) which means ‘to flow’ and ‘to let out’ Spleen is in charge of regulate the blood. Spleen Qi in particular holds blood in vessels. If spleen-Qi is deficient and does not ascend properly, blood may spill out of the vessels causing “hemorrhage”. The liver and spleen complement each other and coordinated in physiological function, liver depression and spleen vacuity combined with Qi stagnation and blood stasis are the key factors causing primary dysmenorrhea.

“Essential Prescriptions of the Golden Cabinet” written by Zhang Ji has three chapters on women’s health: pregnancy, postpartum, and miscellaneous diseases. It is the first book to offer separate chapters on women’s health, and covers theory, methods, formulas, and herbal medicine. Those three chapters contain over 30 formulas for diseases of menstruation, pregnancy, postpartum, vaginal discharge, visceral agitation, and concretions and conglomerations. It introduces formulas such as “**Jiao Ai Tang”, “Gui Zhi Fu Ling wan”, “Dang Gui Shao Yao San”, “Wen Jing Tang”, “Gan Mai Da Zao Tang” and “Ban Xia Hou Po Tang”**. It is the earliest and complete monograph on gynecology in China.

DSS was often thought to be the oldest formula for the treatment of abdominal pain due to Liver-Spleen disharmony. Zhang originally designed the formula to address persistent mild abdominal pain during pregnancy, with or without edema. As understanding of the effects of the formula deepened in the subsequent centuries, its range of application expanded considerably. Primary Dysmenorrhea is abdominal pain due to disharmony between the Liver and Spleen characterized by both blood stasis and qi stagnation with dampness. The pain is like wind-like pain that reflects its root in a Liver disorder, but not as severe as pin from qi stagnation, cold, or blood stasis (therefore reflecting its deficiency nature). This pain occurs more readily, but not exclusively in women, both in relation to the menstrual cycle and during pregnancy. At the same time, diagnostic differentiation must be combined with menstruation, body constitution, accompanying sign, location and nature of the pain all together, excess type such as blood and cold stagnation.

From Traditional Chinese Medicine point, *"Pain means blocked or Unblocked means No pain"*
In medical classic there are five common etiologies and pathologies of dysmenorrhea:

1. Stagnation of the Qi and blood: these Gynecological Symptoms are premenstrual or menstrual lower abdominal distending pain with paroxysmal aggravation, small or large amount of purplish-red flow with clots, and alleviation of the pain after the discharge clots. The general signs of Stagnation of the Qi and blood is PMS. The most effect treatment is moving Qi and blood, to eliminate stagnation and stop pain. **Dang Gui Shao Yao San** was most commonly used with this symptom, which drives out blood stasis below the Diaphragm decoction. Several formulas including Dang gui, Chuan xiong, Bai shao, Fu Ling, Bai Zhu, Ze Xie. **Ba Wu Tang** (eight substances decoctions), also work for treating stagnation of the Qi and blood.

2. (a) Deficiency cold with stagnation: these Gynecological Symptoms are cold sensation and pain or colicky pain in the lower abdomen before or during periods, like pressure, a prolonged menstrual cycle with small amounts of dark-pale blood flow. The general signs of deficiency cold with stagnation are clear and long urination, soreness in the lower back and knees, deep pulse, and white and moist tongue. The most effective treatment is to warm the channels and worm, expel cold, regulate the blood and stop pain. **Modify Wen Jing Tang** was often used to warm the menses decoction. The formulas used include Dang gui, Wu zhu yu, Gui zhi, bai shao, Ren shen, Sheng jiang, Ban xia, Mu dan pi, E jiao, Gan cao, Fu zi, Ai ye, and Xiao hui xiang.

   (b) Retention of cold-damp stagnation: these Gynecological Symptoms are: cold pain in the lower abdomen before or during periods, relieved by warmth and worse with pressure, a prolonged menstrual cycle with small amounts of dark-purple flow with clots. The general signs of retention of cold-damp stagnation is body ache or aversion to cold, white greasy tongue coating, deep and tight pulse. The most effect treatment is to warm the channels and expel cold damp, invigorate blood and stop pain. Using **Modify Shao Fu Zhu Yu Tang** to drive out stasis from the lower abdomen decoction. The formulas used include Dang gui, Chuan xiong, Xiao hui xiang, Gan jiang, Mo yao, Cang zhu, Fu ling, Rou gui, Chi shao, Pu Huang, Wu ling zhi, and Yan hu suo.

3. Damp-heat in the liver channel: these Gynecological Symptoms are: distending pain or pulling pain in the lower abdomen before or during the period, possibly occurring bilaterally, the pain with a burning sensation aggravated by pressure. The general signs of damp-heat in the liver channel is a shortened or prolonged menstrual cycle with small or large amounts of sticky, purplish-red flow and no clots. The most effective treatment is

clear heat, resolve dampness and eliminate stasis. **Modify Qing Re Tiao Xue Tang** was often used to clear heat and regulate blood decoction. The formulas include Tao Hong Si Wu Tang and Mu dan pi, Huang lian, E zhu, Xiang fu, Yan hu suo, Yi yi ren, Hong teng, and Bai jiang cao.

4. Deficiency of Qi and blood: these Gynecological Symptoms are lower abdominal pain of a dull, lingering or bearing-down nature towards the end of or after the period, which may be alleviated by pressure. The general sign of deficiency of Qi and blood is a prolonged menstrual cycle with large amounts of light-red flow and absence of clots. The most effective treatment is to tonify Qi, nourish blood and relieve pain. **Modify Sheng Yu Tang** was commonly used as a sage-like healing decoction. The formulas include Dang gui, Chuan xiong, Sheng di, Bai shao, Huang qi, Ren shen, Xiang fu, and Yang hu suo. **Shi Quan Da Bu Tang** (Ba Zhen Tang plus Huang qi and Rou Gui) also works for treating deficiency of Qi and blood.
5. Liver and kidney Xu: these Gynecological Symptoms are dull lower abdominal pain towards the end of or after the period, soreness in the lower back. The general signs are a prolonged menstrual cycle with small amounts of light-dark flow and no clots. The most effective treatment is to tonify the kidney, nourish the liver will stop in pain. **Tiao Gan Tang** is often used to regulate the liver decoction. The formulas include Dang gui, Shan yao, E jiao, Bai shao, Shan zhu yu, Ba ji tian, and Gan cao. On the other side, **Yi Shen Tiao Jing Tang** is used to tonify the kidney and regulate the menses. The formulas include Dang gui, Bai shao, Shu di, Yi mu cao, Ba ji tian, Du zhong, Xu duan, Wu yao, and Ai ye.

Treating Primary Dysmenorrhea with DSS

TCM treatment of dysmenorrhea has obvious advantages and less side effects than use of NSAIDs. Most TCM treatment experience and feedback will be reflected in the formula of the prescription. The prescription is adjustable and depends on patient's symptoms. They are scattered in ancient classic and modern medical books and clinical literature. Researchers from the "Dictionary of traditional Chinese medicine prescription" and "The prescription of traditional Chinese medicine obstetrics and gynecology" collected 425 ancient and modern dysmenorrhea prescriptions. Statistics of the top three most common diagnosis of Primary Dysmenorrhea are Qi and blood stagnation, Cold coagulation and blood stasis, and Ovary stasis. On the other side, the top three prescriptions to eliminate stasis to activate blood formulas, regulate qi to dissipate blood stasis formula, and dispel internal cold formula. The above-mentioned core herbs are Dang gui, Chuan qiong, Yan hu suo, Xiang fu, Bai shao, Wu ling zhi, Tao ren, Wu yao, Rou gui, and Hong hua. The combination of Dang qui and Chuan qiong has a very important effect in the prescription of Primary Dysmenorrhea, and that is also basic formula of DSS.

Original Source of DSS

DSS is a widely used formula of Traditional Chinese Medicine derived from **"Essential Prescriptions of the Golden Cabinet"** (Jin Gui Yao Lue) a medical classic written by Zhang during the Eastern Han Dynasty (Leem et al. 2019). DSS has been used for gynecological disorders for thousands of years. It is composed of Angelicae sinensis (Dang Gui) 9g, White Paeonia Radix (Bai Shao) 30g, Poria (Fu Ling) 12g, Atractylodis macrocephalae Rhizoma (Bai Zhu) 12g, Alismatis Rhizoma (Ze Xie) 15g, and Chuanxiong Rhizoma (Chuan Xiong) 9g. The DSS formula

is well balanced, nourishing and reducing. There are two categories, one is blood region herbs (including Bai Shao, Dang Gui and Chuan Xiong), and the other one is Qi region herbs (including Ze Xie, Fu Ling and Bai Zhu). DSS has the functions of harmonizing Liver and Spleen, smoothing qi and blood, moistening and flowing water, clearing and reducing turbidity, moving the blood, and calming pain.

The following are two quotations from **"Essential Prescriptions of the Golden Cabinet"** that evidence the use of DSS in ancient times:

1. In Chapter 20—Women's pregnancy: "For the women's tense pain in the abdomen during pregnancy, Dang gui Shao yao San governs." This one describes the signs and treatment of abdominal pain in the pregnancy that is due to liver-spleen disharmony

2. In Charter 22—Women's Miscellaneous Disease" For all abdominal pain in women, Chinese An there are "women's abdominal Dang gui Shao yao San governs." The cases treated may also manifest with inhabited urination, abdominal distention and fullness, and slight swelling of the head, face and limbs.

Original indication is for women in pregnancy or menstruation, who has abdominal pain due to disharmony between the Liver and Spleen characterized by both blood stasis and qi stagnation with dampness. Symptoms include continuous, cramping pain of the abdomen that is not severe, urinary difficulty, and slight edema (primarily of the lower limbs), which occur during pregnancy.

General Indications of Primary Dysmenorrhea with DSS

The most common signs and symptoms of primary dysmenorrhea include continuous, cramping pain of the abdomen that is not severe, urinary difficulty, and slight edema (primarily of the lower limbs). Such pain can occur during pregnancy or with a variety of gynecological disorders. This abdominal pain is due to disharmony between the liver and spleen characterized by both blood stasis and Qi stagnation due to dampness. The liver stores the blood and dredges the Qi. The stronger the liver Qi, the better it is able to regulate the Qi dynamic, a process that includes upward diffusion of clear yang as well as downward draining of turbid fluids. When the liver blood and Qi are insufficient, dampness accumulates, the Qi stagnates, and the blood becomes static. This is reflected in continuous cramping pain (a wind-like pain that reflects its root in a liver disorder), which is not as severe as pain from Qi stagnation, cold, or blood stasis (reflecting its deficient nature). The liver is closely connected to the sea of blood in the lower abdomen; it governs women's physiology. Thus, such symptoms occur more readily (but not exclusively) in women, both in relation to the menstrual cycle and during pregnancy. When the liver over controls the spleen, the metabolism of water is disrupted, which gives rise to internal-generated dampness. Dampness contributes to the abdominal pain by causing stagnation. It also causes urinary difficulty and edema, primarily in the lower limbs where it tends to collect.

Here are some characteristics of pain due to primary dysmenorrhea:

- Sustained pain that is milder but more continuous than that for Jiao Ai Tang and no bleeding.
- The pain is in the central abdomen and may extend upward to the epigastrium or chest.
- The pain may prevent bending forward or backward.

- On abdomen palpation, the abdomen alongside of the umbilicus may be tender and hypertonic and may be the same on both sides.

The combination of pain and fluid accumulation is a key maker for the formula's use in the clinical practice. These symptoms may be accompanied by cold (either a subjective aversion to cold or coldness of the extremities), fatigue (deficiency), and some kind of edema (often around eyes).

Modern application of Primary Dysmenorrhea with DSS

DSS has a wide range of adaptations and also has many treatment syndromes. In clinical application, on the basis of "differentiating syndromes and seeking the cause, examining the cause and treating," then understand its scope of application, can often achieve the expected therapeutic effect. It resolves an underlying pattern that is common to a multitude of physiological disruptions, has been found to be effective in treating an unusually large array of indications.

Pregnancy with symptoms of abdominal pain and bleeding: such as dysmenorrhea, amenorrhea, infertility, functional uterine bleeding (Zhaorong Ding and Fang Lian, 2015), Perinatal period with edema and diarrhea as the associated symptoms: such as the abnormal position of the fetus, fetal dysplasia, threatened abortion, habitual abortion, pregnancy induced hypertension syndrome (Xiong, et al. 2013). Immune related Liver diseases with yellow complexion, edema as symptoms: such as chronic hepatitis, liver cirrhosis, Hashimoto's disease, iron deficiency anemia(Xu,2020). Acne with scanty menstruation, diarrhea; liver spots; anal-rectal prolapse; hemorrhoids and so on all are opportunities to use modified DSS.

On the other side, (Lee, 2016) found that the aqueous extract and alcohol extract of DSS can inhibit the spontaneous contraction of isolated uterus of rats, resist the spasm of uterine smooth muscle

caused by pituitrin and prostaglandin E1, and are effective for various gynecological pain. Other experiments have proved that DSS has the functions of anti-inflammatory, sedative, regulating the endocrine balance of hypothalamus pituitary ovary axis, regulating the autonomic nerve function, reducing blood viscosity, improving microcirculation, inhibiting blood coagulation and platelet aggregation, and anti-anemia.

It was also found the significant effect in the infertility field, in 2016 Hung, et al. included 8766 women with newly diagnosed infertility in this study. This is an important large-scale survey of Chinese herbal prescriptions and herbs used in the treatment of female infertility in a Taiwanese population. Of those, 8430 (96.17%) had sought traditional Chinese medicine treatment in addition to visiting the gynecologist. These seemed to be high demand by infertile women for traditional Chinese medicine treatment as a complementary or alternative medicine. Ninety-eight percent of all prescriptions for female infertility contained at least 2 Chinese herbal prescriptions per prescription. There was an average of 5.81 Chinese herbs in a single prescription. DDS was the most commonly prescribed herbal formula (17.25%), followed by Wen-Jing-Tang (16.35%). The study found that the most common individual Chinese herbal prescriptions and herbs among female infertility patients were DDS and *Semen Cucuta*. DSS is an herbal mixture used for abdominal pain during pregnancy. Previous reports revealed that DSS corrects luteal phase insufficiency via an antioxidant mechanism or an antagonistic action on both prostaglandin F2-α and acetylcholine-induced uterine contraction.

In Japan, one clinical study on the effects of DSS was conducted in vivo, with a group of 50 women. Basal body temperatures and abnormal hormonal levels verified by blood and urine tests indicated luteal insufficiency in 35 participants in this study. A portion of the group (15 women) had dysmenorrhea, exhibiting PMS symptoms but had normal menstrual cycles and hormonal

levels. All were given 7.5g of the DSS formula daily, dosing 2.5g, 3 times daily for more than three months. The results suggest that DSS improves luteal insufficiency in women by establishing proper hormonal balance, yet does not adversely affect the hormonal levels of women with normal menstrual cycles. iv Thus DSS was shown to have no adverse effects on the hormonal levels in women with normal menstrual cycles.

Chapter 2: Literature Review

Dysmenorrhea is a widespread gynecological problem which involves experiencing a pain before, during and/or after menstruation. The current treatments that apply the use of synthetic medications such as analgesics and placebos have not been effective and have created interest in the reasons why the traditional Chinese medications solved dysmenorrhea cases effectively as compared than those that are currently used in Western medicine.

Traditional Chinese medicine has treated Primary Dysmenorrhea for more than 2000 years and its featured therapies include Chinese herbal medicine, acupuncture, moxibustion, massage, cupping, qigong, and food therapy. The effectiveness of acupuncture (Woo HL et al., 2018), moxibustion(Gou CQ, et al., 2016), and massage (Sut N, et al., 2017) in treating Primary Dysmenorrhea have been reviewed. According to the guidelines set by the Japan Society of Obstetrics and Gynecology and Japan Association of Obstetricians and Gynecologists (2011 edition), traditional Chinese medicine could be used for Primary Dysmenorrhea. In 2011 Takeda T. et al. reported that a number of clinical trials established Chinese herbal medicine is beneficial for the treatment of Primary Dysmenorrhea. Jaafarpour et al. found that Cinnamon markedly lightens the severity and duration of menstrual pain. In 2015. Rehman et al. also confirmed Rheum Emodi is able to relieve the symptoms of Primary Dysmenorrhea.

In recent years, there have been a few systematic reviews on specific traditional Chinese medicine prescriptions for treating Primary Dysmenorrhea. There are two different protocols. In the first one, the effect of Chinese herbal for Primary Dysmenorrhea, patients received various Chinese herbal medicines instead of the synthetic medications they had expected. In the second protocol, traditional Chinese medicine was limited to DSS that is, DSS was the only herb medicine given to

treat Primary Dysmenorrhea. The detail regarding the studies use can be found in chapter 3 (Methodology).

The effect of Chinese herbal medicine for Primary Dysmenorrhea

In 2014, Chen et al. performed an investigation into Chinese herbal medicine for primary dysmenorrhea in Taiwan. In this observational retrospective study, a total of 57,315 prescriptions were given to the women between the age of 13 to 25 during 1998 to 2008. On average, 5.3 herbs were used in one prescription. DSS was the most commonly used herbal formula (27.2%), followed by Jia-Wei-Xiao-Yao-San (JWXYS) (20.7%) and Wen-Jing-Tang (WJT) (20.5%). Multi-target effects on primary dysmenorrhea, such as analgesia, mood modifying and hormone adjustment, were found among commonly prescribed Chinese herbal medicine in this study.

A 2018 study to examine the longitudinal change in Australian women's prevalence of cyclic premenstrual pain and discomfort and the association between their symptoms and use of complementary and alternative medicine (CAM). The examined period of the study was during 2006 to 2013 and analyzed the women between the age 28 to 33. The result shows that women's use of all other CAM practitioners increased as did their use of vitamin/minerals, yoga/meditation, and Chinese medicines, while aromatherapy use declined. (Carole Fisher, et al.,2018)

A random, double blind, placebo-controlled, pilot clinical trial was conducted in an ad hoc clinic setting at a teaching hospital in Taipei. Seventy-eight primary dysmenorrhea young women were enrolled. A dosage of 15 odorless capsules daily for five days starting from the onset of bleeding or pain was administered. Statistically significant differences in both peak-pain and overall-pain appeared in the first follow-up cycle. (Lan Lan Liang Yeh, et al.,2007)

Zhu et al. involved a total of 3475 women in a systematic review to assess the efficacy and safety of traditional Chinese medicines in the treatment of primary dysmenorrhea. The results showed a significant advantage compared with other treatments. Similar conclusions were also obtained in the meta-analysis of Shaofu Zhuyu decoction (SZD), (Lee H, et al.2016) and Wen jing decoction (Gao L, et al.2017).

The effect of DSS for Primary Dysmenorrhea

From 2014 to 2017, there were three articles in China that discussed the Clinical application of treating dysmenorrhea with modified DSS. In 2010~2013, 68 women aged 18~50 years old with dysmenorrhea with blood deficiency and liver depression, or spleen deficiency and dampness were chosen and randomly divided into two groups. The treatment group took modified DSS (ex: women has more leucorrhea add Huang bai, abdomen pain serious add Chuanlianzi). The control group only took only the Leonurus Artemisia powder (Yi Mu Cao). The improvement ratio result shows that treatment group was 83.3% better than the control group 59.3% (Aijun Li & Yong liang Lou in 2014, Chunping Zhang in 2016, Shu Li in 2017).

The second part of the study was done by Liao (2012). These 70 primary dysmenorrhea cases from May to October 2011 in Taiwan were randomly divided into the treatment group and control group. The treatment group received DSS, and the control group was given XuanYu given. The period of treatment was three menstrual cycles. The result showed the total effective rate of the treatment group clinical 91.5%, the control group clinical effective rate was 88.6%, both groups of curative effect is statistically significant ($P < 0.05$).

In 2017, Xin Wang study a total of 72 women aged 14~35 years old were randomly divided into two groups, all of them in primary dysmenorrhea and with abdominal pain during or before menstruation, or pain to the waist, the most severe person faints. The treatment group took modified DSS (ex: women has Cold-pain with cinnamon and Cumin, stabbing pain with Tao ren and Hong hua) and the control group toking NSAID for three menstrual cycles. The improve ratio result shows that treatment group 89.47% better than control group 76.32%. On the other side, Hongjuan Li also get the similar result in 2006.

In 2016, there were two studies in China to analyze the clinical effect of modified DSS in treating primary dysmenorrhea. Women who suffered from dysmenorrhea of liver stagnation and spleen deficiency were randomly divided into a control group and an observation group. The control group was given dysmenorrhea Granules; the observation group was given modified DSS for three months. The change of PGF2α & PGE2 was used to determine the effects of substances used. The PGF2α of the observation group was significantly lower than the control group. The totally efficiency ratio is 90.57%. (Yanan Wu in 2016, Qiufeng Sun in 2016).

A 2016 Taiwan study, used the descriptive statistical analysis to measure 11,860 females who used DSS from 2005 to 2007, which had clinical effect. The results show the highest utilization rate of DSS for the clinic in Taiwan. On the other side, the patients using DSS to treat primary dysmenorrhea compared to patients not using traditional Chinese medicine had lower incidence of endometriosis (5.30% vs. 8.57%).

In 2006 study in the Netherlands, 36 women who were drawn from the general population participated in the observation cycle. They were randomly divided into a treatment group and a control group. The treatment group was given DSS and the control group was given placebo tablets that were indistinguishable in appearance. Treatment continued for three consecutive menstrual

cycles. The result showed after cycle 3, 53% of women in the TCM group reported less pain than usual compared with only 26% in the placebo group. Although not statistically significant, the finding nevertheless supports the effectiveness and safety of DSS (Kennedy et al.).

In 2016, Lee, H. W., et. al used Meta-analysis to search the three electronic databases, of all randomized clinical trials of DSS or modified DSS through October 2015. A total of 746 potentially relevant studies were identified, and met the criteria. The systematic review and meta-analysis provided suggestive evidence of the superiority of DSS over analgesics or placebo for dysmenorrhea. The quality of evidence for this finding was low to moderate because of a high risk of bias.

In 2014, Jing Xia combined two old prescriptions, DSS and Guizhi Fuling Pills from "Essential Prescriptions of the Golden Cabinet" to analysis their effect on Primary Dysmenorrhea. The study involved 45 women aged between 17 to 32 and exclude who is non-primary dysmenorrhea. They had different symptoms such as Qi of stomach increase to nausea and vomiting, liver depression and breast pain, abdominal and limbs cold pain. They all took modified DSS and Guizhi Fuling Pills for three menstrual cycles. The improvement ratio result shows 83.3%.

In 2020, Hye Lin Woo, et al. collected 240 participants in Korea between 18 to 40 were divided into one of three groups. The interventions will be administered for two menstrual cycles, and the follow-up will be carried out for the following six menstrual cycles. The results of this clinical trial will offer further of evidence of the efficacy and safety of DSS for primary dysmenorrhea.

Chapter 3: Methodology

The purpose of this research synthesis was to ascertain whether women who suffer from primary dysmenorrhea obtain relief when treated with DSS. This chapter highlights the research methods used to determine those points and the clinical procedures utilized to accomplish the objective.

The General Statement of the 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 text 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, and the difficulty of interpreting improvement in pain.

Sample Procedures

A web search was conducted in 2020 to find studies on treating primary dysmenorrhea with DSS.

The initial search using the terms “primary dysmenorrhea” and “herb” on the PubMed search engine resulted in 516 articles found. When the search was repeated using the term “Dang-Gui-Shao-Yao,” only 9 articles were found. To expand the results, a wider range of terms were used on additional search engines. Peer-reviewed medical articles were looked for on PubMed, Science Direct, The Journal of Alternative and Complementary Medicine, Google Scholar, and the Wiley Online Library, using the following combination of medical subject headings and their synonyms: herbal medicine OR Chinese Herb OR Dang-Gui-Shao-Yao OR San OR AND dysmenorrhea OR primary dysmenorrhea. Those searches resulted in 98 articles being found.

Of the 98 total articles, 53 were deleted from the results because they did not involve DSS. Another 34 studies were eliminated because they discussed the treatment of diseases other than primary dysmenorrhea (e.g. premenstrual syndrome, cancer, menopause, and diabetes). The remaining 25 articles focused on treating dysmenorrhea with DSS, but 13 of them were rejected

due to incomplete documentation [or were combined with Acupuncture treatment, used non-human testing or used other formulas in addition to DSS.] Ultimately, only 13 studies were useable in their entirety.

Inclusion Criteria: To be included in this research, each study had to meet all of the following criteria: it had to be published in a peer-reviewed journal, it had to involve women of reproductive age who had primary dysmenorrhea, the study must be limited to the use of DSS, and it was required to have clear documentation of protocol and acupuncture points utilized.

Exclusion Criteria : Studies meeting any of the following criteria were excluded: studies published before 2000 (to ensure that chosen studies were available in complete manuscript form and were readily available through electronic databases), studies involving women with a history of secondary dysmenorrhea, studies involving women who were not suffering from primary dysmenorrhea at the time, and studies with oral or injection of any other analgesics, studies involving acupuncture-stimulation. Other studies were excluded because they lacked essential documentation such as DSS methodology.

Data Analysis

Two of the most common forms of analysis in qualitative research, content and thematic analyses, 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 DSS used in collected studies. Data were collected and analyzed according to the researcher's abstraction form, with the predetermined inclusion and exclusion criteria.

Human Research Ethical Considerations

No informed consent was needed for this research synthesis because it consisted only of literature review. No human subjects were enrolled in this study and therefore human research ethical considerations were not involved.

Chapter 4: Results

This chapter collates the results of the studies discussed in the literature review. It focuses on summarizing the efficacy of DSS for Primary Dysmenorrhea. 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 as noted above some studies that initially fit the abstraction form were later removed for having vague results.

From Table 1, there are a total 598 women involved in 9 studies of treatments performed with improve ratio using DSS from 2006 to 2017. All the studies used control and treatment groups to exam the efficiency of taking DSS for measurement periods at least three months. The statistical results are as follows: the improvement ratio of treating group with DSS is from 53% to 91.5%, the average ratio is 85.53% higher than control group's average ratio 59.65%. Even if the improvement ratio is not shown in Table 2, those four studies offer evidence of the efficacy and safety of DSS for primary dysmenorrhea from 2016 to 2020.

Table 1: Studies of treatments performed with improve ratio on DSS

First author (year)	Participants	Formula (add-on composition of formula according to pattern identification/syndrome differentiation)	Finding
Yen-Ching Liao (2012)	70 women	DSS	The recovery rate of treating group with DSS is 91.5% higher than control group 88.6 and both treatment statistically significant (P< 0.01)
Kennedy S. (2006)	36 women	DSS	53% of participants in the TCM group had reduced pain than usual against 26 % in the placebo group.
Aijun Li (2014)	68 women	Modified DSS: Leucorrhea add Huang bai,and Qian Shi Abdomen pain serious add Chuan lian zi Cold pain add Wu yao and Aiye Backache add Du zhong and Chuan Xu duan	The improve ratio result shows that treatment group 83.3% better than control group 59.3%.

Chunping Zhang (2016)	64 women	Modified DSS: Leucorrhea add Huang bai,and Qian Shi Abdomen pain serious add Chuanlianzi Cold pain add Wu yao and Aiye Backache add Du zhong and Chuan Xu duan	The improve ratio result shows that treatment group 93.8% better than control group 53.1%.
Shu Li (2017)	100 women	DSS	The improve ratio result shows that treatment group 94% better than control group 54%.
Hongjuan Li (2006)	90 women	Modified DSS: Stabbing pain add Tao ren and Hong hua Cold pain add Cinnamon and Fennel Bloating pain add Yu jin and Chuan lian zi	The improve ratio result shows that treatment group 91.1% better than control group 60.2%.
Yanan Wu (2016)	53 women	Modified DSS: Liver depression and Qi stagnation add Xiang fu,Yu jin and Chai hu Blood stasis add Tao ren and Hong hua	The totally efficiency ratio is 90.57%
Xin Wang (2017)	72 women	Modified DSS: Stabbing pain add Tao ren and Hong hua Bloating pain add Yu jin and Xiang fu	The improve ratio result shows that treatment group 89.47%

		Cold pain add Cinnamon and Dry ginger Dull pain add Huang qi and Dang shen	better than control group 76.32%.
Jing Xia (2014)	45 women	Modified DSS: Liver depression and breast tenderness add Chuan lian zi and Yu jin Cold pain add Pao jiang, Cumin and Aiye Qi and blood deficiency add Huang qi and Dang shen Backache add Xu duan, Shan zhu yu and Sang jisheng Blood fever add Hu Zi and Sheng di huang	The improve ratio result shows 83.3%.

Table 2: Studies of treatments performed on DSS

First author (year)	Participants	Formula (add-on composition of formula according to pattern identification/syndrome differentiation)	Finding
Hye Lin Woo (2020)	240 women	DSS	Clinical trial will offer evidence for the efficacy and safety of DSS for primary dysmenorrhea.
Yu-ling Lu (2016)	11,860 women	DSS	DSS has a lower incidence of endometriosis (5.30% vs. 8.57%) compared with those who do not seek TCM treatment.
Lee, H. W. (2016)	746 potentially relevant studies	DSS	The evidence of the superiority of DSS over analgesics or placebo for dysmenorrhea. The quality of evidence for this finding was low to moderate because of a high risk of bias.
Qiufeng Sun (2016)	82 women	Modified DSS: Additional add Dry ginger, Xiang fu, Gan cao, Hong hua and Zhu yu	Both treatment statistically significant ($P< 0.05$)

It also can be seen from the above table that the key pathology of dysmenorrhea is "stagnation." In 2004, Sun and Jiang counted 99 Chinese journals on the treatment of dysmenorrhea with traditional Chinese medicine from 2003 to 2004, and found the prescriptions used most was activating blood and removing stasis formula 32.3%, tonic formula 23%, regulating Qi formula 11.8% and warming meridians formula 8.4%. After statistic, the top 10 most frequently used Chinese medicine is Dang Gui (88.9%), Chuan Xiong (78.8%), Yan Hu Suo (70.7%), Xiang Fu (63.6%), Cinnamon (44.4%), Bai Shao (43.3%), Hong Hua (42.4%), Tao Ren (41.4%), Wu Ling Zhi (38.4%), and Wu Yao (36.4%).

Table 3: The top 10 core herbs of primary dysmenorrhea

Herb	Flavor and Meridian tropism	Efficacy	Indications
Dang Gui	Sweet, hot and warm. Return to liver, spleen and heart channel	Activate blood Adjust menstruation Relieve pain Laxative	It called Gynecological Holy herb, for surgery also used widely with muscle growth.
Chuan Xiong	Hot and warm. Return to liver, gallbladder and heart channel	Activate blood Exercise Qi Relieve pain	Essential medicine for Gynecological blood circulation and menstruation. "Headache is inseparable Chuan Xiong" means good for treat headache.

Yan Hu Suo	Bitter, hot and warm. Return to liver, spleen and heart channel	Activate blood Exercise Qi Relieve pain	Mainly used in stagnation of Qi and blood with pain. The effect of pain reduce is great and could combine with any formula.
Bai Shao	Bitter, sour and sweet. Return to liver, spleen channel	Nourish blood Adjust menstruation Relieve pain Relieve sweat	Antispasmodic effect, It also has certain sedative, analgesic, anticonvulsant, antihypertensive, and vasodilator effects.
Xiang Fu	Micro Bitter, hot, sweet and flat. Return to liver, spleen and San Jiao channel	Regulating Qi Soothing liver Adjust menstruation Relieve pain	Essential medicine for qi and pain relief.
Rou Gui	Sweet, hot and warm. Return to liver, spleen, kidney and heart channel	Warming interior Dispelling cold Relieve pain Warm meridians	Dilated blood vessels, promote circulation and increase coronary and cerebral blood flow, reduce vascular resistance, etc.
Hong Hua	Hot and warm. Return to liver and heart channel	Activate blood Relieve stasis Relieve pain	Specialized in blood and regulates meridians. It could be used independent.

Wu Ling Zhi	Bitter, salt, sweet and warm. Return to liver channel	Activate blood Relieve stasis Relieve pain	Relieve smooth muscle spasm
Tao Ren	Bitter, sweet and flat. Return to heart, liver and intestine channel	Activate blood Remove stasis Laxative	Multiple used in blood stasis symptoms: bruises, amenorrhea and dysmenorrhea. It was called Po Xue Yao.
Wu Yao	Hot and warm. Return to liver, spleen, kidney and bladder channel	Regulating Qi Relieve pain Warm kidney Dispelling cold	Gastrointestinal tract has two-way regulation of excitement and inhibition. Relieve muscle cramps and pain

Results from Efficacy of DSS in Treating Primary dysmenorrhea

Most of the studies reviewed and selected from over the last 10 years for this research demonstrate how the modern Chinese medical practitioners employ more herbal medicine than modern synthetic drugs. They recognize the compounds in the herbal medicines as natural with immediate actions and results on the patients. However, at the health centers surveyed in China, the practitioners said that no drug lacks natural extracts and that only the form changes, that is the chemical combination remains untouched even in research and development of drugs. The fact is that many studies on its effects and efficacy of DSS on primary dysmenorrhea demonstrate that embrace of traditional herbal medicine yields very good results.

Summary

Based on the combined successful outcome of the 13 studies herein, even when taking into account the difficulty of measuring the description of the pain level and location. Respondents had the knowledge of the experiences they were undergoing concerning primary dysmenorrhea though they have local ways of expressing their symptoms. What is important is that the women in the collected studies had symptoms that decreased over time, and the care was not just palliative, as they subjectively felt that the pain was reduced from eight weeks to three months after the test.

Chapter 5: Discussion

There is a wealth of positive information regarding the efficacy of Chinese herbal medicines for treating Primary Dysmenorrhea, with DSS being the most commonly used herbal formula. Even with modern studies, it continues to be valuable to study **"Essential Prescriptions of the Golden Cabinet"** to provide us with instructive insight into the theoretical aspects of treating primary dysmenorrhea with DSS.

The root base of DDS for Primary dysmenorrhea

As Chapter 1 mentioned, the etiology of primary dysmenorrhea is accumulation of damp-heat in the liver and spleen channels. DSS has the functions of promoting blood circulation and removing blood stasis, regulating qi and blood, and relieving Qi and analgesia without the disadvantage of dryness and heat.

"Essential Prescriptions of the Golden Cabinet" points out that "to see the disease of the Liver, and know the disease will translate from the Liver to the Spleen, and so should first strengthen the Spleen." This prescription can be used in combination with the methods of strengthening the Spleen and purging the Spleen, tonifying the Liver and dispersing the Liver, reflecting the principle of Liver and Spleen harmonizing, which deserves attention in clinical practice. "Use Formula to Assess Syndrome" is a methodology in keeping with the overall concept of traditional Chinese medicine and the practice of syndrome differentiation and treatment, applied according to the principle of with said syndrome use said medicine. It is a method to study the syndrome and treatment of prescriptions by analyzing the specific syndrome performance of diseases from the

properties of prescriptions. Primary dysmenorrhea is in the Liver and affects the Spleen, and should be treated mainly by regulating the Liver and nourishing the Spleen.

Through the analysis of the other side syndrome, we know that DSS can treat both blood deficiency and blood stasis, with Spleen deficiency and phlegm dampness. At the same time, **"Essential Prescriptions of the Golden Cabinet"** also puts forward the view that "when blood is not moving smoothly, then becomes water," which provides us with clinical guidance. With patients presenting with edema, one often needs to consider the existence of blood stasis. Once the existence of blood stasis is detected, the addition of blood activating drugs on the basis of diuretic drugs is very effective.

The concept of "Simultaneously treating blood and water" is important in order to grasp the relationship between Liver and Spleen. Liver governs the dredging, and its important role is to regulate the operation and distribution of blood and body fluids. The central concept of the function of Liver dredging is to regulate the qi mechanism, which constructs the relationship between water and blood with "Liver qi" as the center. The Spleen dominates the transport, and the excess water retention can only become body fluid through the transport and transformation of the Spleen. The transport and transformation function of the Spleen is closely related to the Liver. The close relationship between the Liver and the Spleen is the main contradiction of the syndrome of water-blood interaction in pathological conditions.

Qi regulation is also an important factor in the process of "Simultaneously treating blood and water." Qi can move the body fluid and also blood. The basis of blood movement is the regulation and promotion of qi. If the qi movement is smooth, phlegm and blood stasis can move, blood and water flowing smoothly can cure the disease. The motivating force of qi movement should be the Zheng qi of human body, so when we attach importance to qi stagnation, we should not forget qi

deficiency. If the Liver qi is weak and lax, it is mostly caused by the insufficiency of Liver blood. Therefore, at this time, the qi regulating system needs to be supplemented in addition to nourishing the Liver blood to restore the smooth function of the Liver qi dredging.

There are two diagnoses needed to assistant to get overview judgment, from the tongue diagnosis, the phlegm is often manifested in the tongue coating, which can be slightly thick or greasy; the tongue quality can often reflect the water dampness and blood stasis. If the tongue body is fat, there is a lot of saliva on the tongue, with tooth marks, it often indicates Spleen deficiency so body fluids cannot transform, which results in internal water retention. If the tongue is purplish and dark or even has ecchymosis, and the sublingual collaterals are deep, it often indicates blood stasis. In terms of pulse diagnosis, a hesitant pulse usually indicates blood stasis, and also blood stasis has no fixed pulse, so it is difficult to judge blood stasis only by pulse condition. From clinical experience, it is more common for DSS to have slippery pulse, which is an important sign to indicate that there is water damp phlegm retention in the body. Through the combination of tongue and pulse, we can judge the syndrome of DSS.

The mechanism analysis of DSS for Primary dysmenorrhea

The traditional DSS composition is Dang Gui 9g, Bai Shao48g, Fu Ling12g, Bai Zhu12g, Ze Xie24g, Chuan Xiong24g. In order to increase liver blood and reduce pain, the Bai Shao's proportion is relatively high. Dang Gui and Chuan Xiong both support Bai Shao. Bai Shao provides pain relief and is also good for urination, supplementing vital energy, and promoting blood circulation. In modern pharmacology, it has sedative, dilation, and analgesic effects. The advantage of Bai Zhu is its effect on the Qi between the waist and navel. It can indirectly cure

blood, eliminate wind and cold dampness, the moisture would make blood stagnation and further development other diseases mentioned by “The Holy Husbandman's Classic on Roots and Herbs” vol. 6. In conclusion, Bai Zhu can tonify spleen Qi, dry the moisture and is good for both CV and TV. Dang gui was called Gynecological Holy herb, activating blood circulation and supplementing blood. In “New Compilation of Materia Medica” (Ben cao cong xin) mentioned Dang gui can let skin shine, dissipate blood stasis and renew, nourishing stomach, drain damp and relieve pain, and let Qi and blood function normally. Chuan Xiong is warm in nature but spicy, it enters liver, gall and pericardium channel. It called “Qi of blood herb,” promoting qi to activate blood. Fu Ling can promote urination and leach out dampness, and also strengthens the spleen, And Ze Xie is similar to Fu Ling but can drain kidney fire.

Understanding the characteristics of above herbs and study on the combined efficacy of traditional Chinese herb prescriptions for primary dysmenorrhea is very important. There are three combined effects can be discussed as below:

A. The effect of Dang gui and Chuan Xiong

This combination has a very important position in the prescription for dysmenorrhea. In” Arcane Essentials from the Imperial Library” (Waitai Miyao Fang) vol. 33 called the combination “Shén yàn tāidòng fang.” Another name was “Fos hou San” in “Pǔ jì běnshì fang” vol. 10, or called “Xiong Jian San” in “General Records of Holy Universal Relief “ (Sheng Ji Zonglu) vol. 55. In “Obstetrics and Gynecology herbal pair” chapter 7 mentioned Dang gui combined with Chuan Xiong can treat dysmenorrhea of Qi stagnation and blood stasis type. Dang gui is responsible for tonifying blood and Chuan Xiong is for activating blood, and regulating menstruation and relieving pain. They are the most effective herbal combination for irregular menstruation with blood deficiency and stasis and dysmenorrhea. “New Compendium of Materia Medica” (Ben cao xin

bian) vol. 2 comment Chuan Xiong states that "the herb could be king or minister or officer, but can't be used by independent, must assist by supplementing Qi or blood herb, making the benefit twice as effective. Adding the combination into supplementing blood prescription, Chuan Xiong Spicy fragrance could nourishe blood and operate the Qi in the blood, supplementing blood without stagnation."

B. The effect of Dang gui and Bai Shao

Dang gui and Bai Shao from the basic prescription for nourishing blood and pain. This combination has a high frequency of use. There are also many other famous prescriptions including Dang Gui Si Ni Tang, Shao Fu Zhu Yu Tang, and Tiaogan Tang. In "Obstetrics and Gynecology herbal pair" chapter 7, Dang Gui is warm in nature and can nourish and supplement blood. Bai Shao is cool-natured and can supplement blood. Its closed taste is sour but astringent. The combination of them, one warm one cold, one open one close, is appropriate to supplement blood without stagnation, and relieve pain at the same time.

C. The effect of Dang gui and Bai Zhu

The combination of Dang gui and Bai Zhu is found in "Introduction to Medicine" (Yīxué rùmén), where it is referred to as "Gui Shu San." That combination was initially used to treat gastrointestinal pain but its use expanded to gynecology for treatment of the spleen. As discussed earlier, the malfunction of the spleen readily produces moisture, and moisture inhibits the flow of Qi between the waist and naval, which affects both the Conception Vessel and Thoroughfare Vessel cases and thereby causing dysmenorrhea. The combination of Dang gui and Bai Zhu can tonify Qi and supplement blood of women with primary dysmenorrhea of Qi and blood deficiency type; if the dysmenorrhea is of the cold dampness and weak spleen type, the combination can

strengthen the spleen and dry the moisture, providing nourishment to the spleen and supplementing the blood. In most studies, DSS was used as a basic prescription, which was then modified to address particular ailments as follows:

- Abdomen pain serious add Chuan lian zi
- Stabbing pain or Blood stasis add Tao ren and Hong hua
- Liver depression and Qi stagnation add Xiang fu,Yu jin and Chai hu
- Cold pain add Wu yao, Ai ye, Cinnamon, Fennel, Dry ginger
- Backache add Du zhong and Chuan Xu duan, Shan zhu yu and Sang jisheng
- Leucorrhea add Huang bai,and Qian Shi
- Dull pain add Huang qi and Dang shen
- Bloating pain add Yu jin and Chuan lian zi

The efficacy and safety of DDS for Primary dysmenorrhea

This study demonstrates that a traditional Chinese herbal medicine, DSS, has safe and effective modern application in treating primary dysmenorrhea. In the 13 studies evaluated by the researcher, the improvement ratio of the group treated with DSS ranges from is from 53% to 91.5%, with the average ratio is 85.53% higher than control group's average ratio 59.65%. In addition to the fact that that studies show DSS is effective, when the comparing the symptoms before treatment with DSS with those after treatment, the researcher also found that using DSS is also safe, painless, and without side effects. The positive outcomes of the studies using DSS to treat primary

dysmenorrhea are significant for treatment of gynecological diseases in the modern practice of medicine.

Implications for Practice

The review of studies concentrating on the mechanisms of Chinese herbal medicine in the treatment of primary dysmenorrhea has increased the researcher's interest in the subject of how each Chinese herb works, alone and in combination, and how that knowledge can best be integrated into a modern Western medical practice. The studies show that the researcher should continue to explore the beneficial use of DSS and take action to encourage acceptance of this safe and effective Chinese herbal medicine by doctors around the world for the treatment of primary dysmenorrhea. The studies already undertaken provide exciting information about the treatment of primary dysmenorrhea. For example, Hsu, el al. (2003) analyzed the physiological mechanism of Wenjing decoction on uterine contractility in vitro and found that the antagonism of $PGF_{2\alpha}$ (prostaglandin F2alpha) and Ach (acetylcholine) was the major mechanism in the treatment of primary dysmenorrhea. (Hsu, et al., 2003) Dang-Gui has active components such as frolic acid, which shows an inhibitory effect on uterine movement (Su S., et al., 2010). Those studies provide important guidance for the continued exploration of the use of DSS.

Limitations of the Current Study

The limitations on the current study of DSS as treatment for primary dysmenorrhea in particular reflect a more general global difficulty concerning the research, acceptance and use of Chinese herbal medicine in Western medical research and practice.

In the past few decades, many scholars have studied different aspects of the mechanism and efficacy of traditional Chinese medicine in the treatment of primary dysmenorrhea. The difficulty is that full appreciation and assimilation of the studies demonstrating the efficacy and safety of DSS is hampered by the East-West dichotomy in the approach to understanding and investigating health and disease, and in evaluating the curative effects of a treatment. It is necessary, therefore, to develop guiding principles for the Western medical researcher and practitioner for use in evaluating traditional Chinese medicine according to its characteristics, particularly in the United States.

Naturally, to study Chinese herbal medicine in general, and DSS in particular, the herbs must be made available to Western countries. Use of DSS is not possible outside of Japan, China, and some other countries in Asia because of a lack of availability. The United States and other Western countries should allocate funds to increase the understanding, availability, and use of Chinese herbs and to increase the current research of data collected from the Asian countries where DSS is commonly used.

In addition to developing appropriate research methodology and ensuring the availability of DSS, the researcher suggests that an increased focus on societal and cultural differences in approach to medication is needed. Also needed are studies examining and encouraging the use of medical

insurance benefits to treat primary dysmenorrhea with DSS and the education of medical practitioners, including midwives, who treat women with gynecological problems.

Conclusion

In preparing this paper, the researcher used a combination of systematic review and meta-analysis to analyze various studies that provide both empirical and secondary evidence on the efficacy of DSS. This topic is important since it gives a detailed analysis of the effectiveness and efficacy of using DSS to treat primary dysmenorrhea and how it can help can pave a way for the research on other herbal medicines used in China. Qualitative analysis was used in the study and review of the literature with a focus on the primary data sources to see how the previous results and test statistics compare the outcomes and make justifications. The findings from past literature showed that the participants administered with DSS responded to the treatment with symptoms being alleviated while there was little or no significant change in the control group.

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