



Review Article

Menstrual Disorders: Causes and Natural Remedies

Monawara Begum¹, Sumit Das^{2*}, H.K. Sharma¹

¹Department of Pharmaceutical Sciences, Dibrugarh University, Dibrugarh-786004, Assam, India

²Girijananda Chowdhury Institute of Pharmaceutical Science, Azara, Hatkhowapara, NH-37, Guwahati- 781017, Assam

***Corresponding Author:** Sumit Das, Assistant Professor, Girijananda Chowdhury Institute of Pharmaceutical Science, Azara, Hatkhowapara, NH-37, Guwahati- 781017, Assam

Received: 12 May 2016

Revised: 29 July 2016

Accepted: 05 August 2016

ABSTRACT

Menstruation often bring about a wide variety of uncomfortable symptoms. Premenstrual syndrome (PMS) encompasses the most common issues, such as mild cramping and fatigue, but the symptoms usually go away when your period begins. However, other, more serious menstrual problems may also arise. Menstruation that is too heavy or light, or a complete absence of a cycle, all signal issues that can contribute to an abnormal menstrual cycle. Allopathic drugs have shown many significant effect for the treatment of menstrual problem. Hence focus has been turned towards home remedies. Medicinal plants play an important role in management of menstrual disorder like as dysmenorrhea or Amenorrhea. The present review gives detailed information about various medicinal plants and some home remedies used in the treatment of the disease.

Keyword: Menstruation; dysmenorrhea; amenorrhea; medicinal plants

INTRODUCTION

Menstruation, is the periodical flow of blood from the uterus through the cervix and out through the vagina, and it is also called a "period". Menstruation occurs during the years between puberty and menopause[1]. Monthly menstrual periods are a normal part of a woman's life. Menstruation is essential for the renewal of the uterine lining in preparation for

pregnancy. The process of degeneration of endometrial bed and removal of the same though vagina occurs at regular interval and is called the menstrual cycle. The menstrual cycle provides important body chemicals, called hormones, to keep healthy. It also prepares body for pregnancy each month. A cycle is counted from the first day of 1 period to the

first day of the next period. The average menstrual cycle is 28 days long. Cycles can range anywhere from 21 to 35 days in adults and from 21 to 45 days in young teen [2].

It is intended to discuss about this physiological process and associated complications in detail in the following sections including traditional ways to get relief from such discomforts

highlighting the herbs and home remedies commonly used.

Phases of Menstrual cycle

The entire duration of a Menstrual cycle can be divided into four main phases (Fig. 1) such as - Menstrual phase (From day 1 to 5), Follicular phase (From day 1 to 13), Ovulation phase (Day 14), Luteal phase (From day 15 to 28).

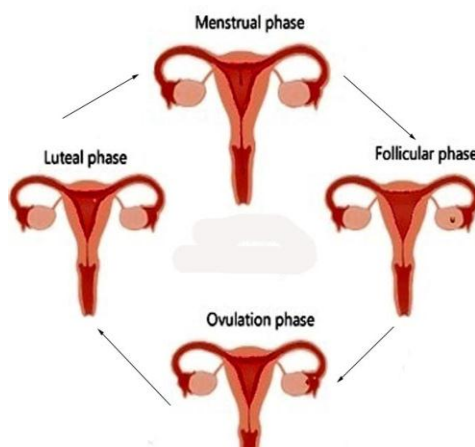


Fig.1: Phases of menstrual cycle [3]

1. Menstrual phase (day 1-5)

Menstrual phase begins on the first day of menstruation and lasts till the 5th day of the menstrual cycle. The following events occur during this phase [3]:

- The uterus sheds its inner lining of soft tissue and blood vessels which exits the body from the vagina in the form of menstrual fluid.
- Blood loss of 10 ml to 80 ml is considered normal.
- During these phase cramps may occur due to the contraction of the uterine and the abdominal muscles to expel the menstrual fluid.

2. Follicular phase (day 1-13)

This phase also begins on the first day of menstruation, but it lasts till the 13th day of the menstrual cycle. The following events occur during this phase [4]:

- The pituitary gland secretes a hormone that stimulates the egg cells in the ovaries to

grow. One of these egg cells begins to mature in a sac-like-structure called follicle. It takes 13 days for the egg cell to reach maturity.

- While the egg cell matures, its follicle secretes a hormone that stimulates the uterus to develop a lining of blood vessels and soft tissue called endometrium.

3. Ovulation phase (day 14)

On the 14th day of the cycle, the pituitary gland secretes a hormone that causes the ovary to release the matured egg cell. The released egg cell is swept into the fallopian tube by the cilia of the fimbriae. Fimbriae are finger like projections located at the end of the fallopian tube close to the ovaries and cilia are slender hair like projections on each Fimbria[3].

4. Luteal phase (day 15-28)

This phase begins on the 15th day and lasts till the end of the cycle. The following events occur during this phase[5]:

- The egg cell released during the ovulation phase stays in the fallopian tube for 24 hours.
- If a sperm cell does not impregnate the egg cell within that time, the egg cell disintegrates.
- The hormone that causes the uterus to retain its endometrium gets used up by the end of the menstrual cycle. This causes the menstrual phase of the next cycle to begin.

Menstrual Disorders

There are a number of different menstrual disorders. Problems can range from heavy, painful periods to no periods at all. There are many variations in menstrual patterns, but in general women should be concerned when periods come fewer than 21 days or more than 3 months apart, or if they last more than 10 days. Such events may indicate ovulation problems or other medical conditions.

Dysmenorrhea (Painful Cramps)

Dysmenorrhea is severe, frequent cramping during menstruation. Pain occurs in the lower abdomen but can spread to the lower back and thighs. Dysmenorrhea is usually referred to as primary or secondary.

- *Primary dysmenorrhea.* Primary dysmenorrhea is cramping pain caused by menstruation. The cramps occur from contractions in the uterus and are usually more severe during heavy bleeding.
- *Secondary dysmenorrhea.* Secondary dysmenorrhea is menstrual-related pain that accompanies another medical or physical condition, such as endometriosis or uterine fibroids [6].

Menorrhagia (Heavy Bleeding)

Menorrhagia is menstrual flow that lasts longer and is heavier than normal. The bleeding occurs at regular intervals (during periods). It usually lasts more than 7 days and women lose an excessive (more than 80 mL) amount of blood.

Menorrhagia is often accompanied by dysmenorrhea because passing large clots can cause painful cramping.

Amenorrhea (Absence of Menstruation)

Amenorrhea is the absence of menstruation. There are two categories: *primary* amenorrhea and *secondary* amenorrhea. These terms refer to the time when menstruation stops:

- Primary amenorrhea occurs when a girl does not begin to menstruate by age 16. Girls who show no signs of sexual development (breast development and pubic hair) by age 13 should be evaluated by a doctor. Any girl who does not have her period by age 15 should be evaluated for primary amenorrhea.
- Secondary amenorrhea occurs when periods that were previously regular stop for at least 3 months.

Oligomenorrhea

Oligomenorrhea (Light or Infrequent Menstruation) is a condition in which menstrual cycles are infrequent, greater than 35 days apart. It is very common in early adolescence and does not usually indicate a medical problem [7].

Premenstrual Syndrome (PMS)

Premenstrual syndrome (PMS) is a set of physical, emotional, and behavioral symptoms that occur during the last week of the luteal phase (a week before menstruation) in most cycles. The symptoms typically do not start until at least day 13 in the cycle, and resolve within 4 days after bleeding begins. Women may begin to have premenstrual syndrome symptoms at any time during their reproductive years, but it usually occurs when they are in their late 20s to early 40s.

Causes of Painful Menstrual Cramps

There could be some factors that lead to menstrual cramps. Given below are a few of the

health conditions that have been known to cause severe menstrual pain and cramps:

- **Hormonal imbalance** is one of the most common causes for menstrual cramps. The prostaglandins, which are hormone-like substances, trigger off contractions in the uterine muscles, which also leads to pain. The higher the level of prostaglandin, the more severe the menstrual cramps are likely to be occurred [8].

- **Pelvic Inflammatory Disease (PID)**, which is a disease or rather an infection, affecting the female reproductive organs (Fig.2). PID is one of the most serious complications of a sexually transmitted disease in women: It can lead to irreversible damage to the uterus, ovaries, fallopian tubes, or other parts of the female reproductive system, and is the cause of cramps and also primary preventable cause of infertility in women [9].

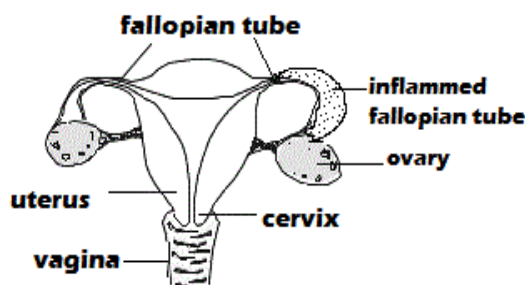


Fig.2: Pelvic Inflammatory Diseases [9]

- **Uterine fibroids** are very common non-cancerous (benign) growths that develop in the muscular wall of the uterus (Fig.3). They can range in size from very tiny (a quarter of an inch) to larger than a cantaloupe. Occasionally, they can cause the uterus to grow to the size of a five-month pregnancy.

In most cases, there is more than one fibroid in the uterus. While fibroids do not always cause symptoms, their size and location can lead to problems for some women, including pain and heavy bleeding [10].

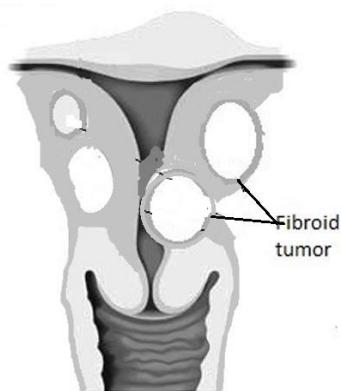


Fig.3: Uterine fibroids [10]

- **Cervical Stenosis**, where the opening of the cervix is quite small because of which, it impedes the flow of blood. This causes the pressure in the uterus to increase, along with the pain.
- **Adenomyosis** is a condition in which the inner lining of the uterus (the

endometrium) breaks through the muscle wall of the uterus (Fig.4). Adenomyosis can cause menstrual cramps, lower abdominal pressure, and bloating before menstrual periods and can result in heavy periods [11].

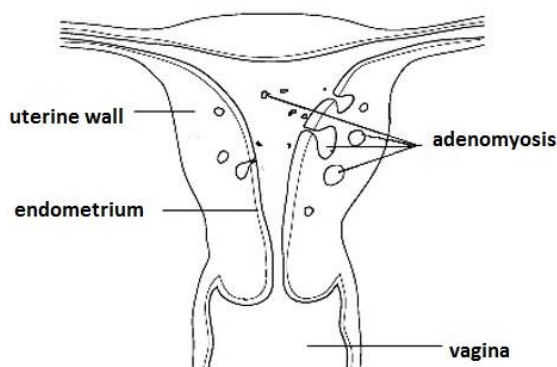


Fig.4:Adenomyosis [11]

- **Endometriosis** is a very painful health condition, where the tissues that are supposed to line the walls of the uterus get implanted in other parts of the body,

mainly the fallopian tubes, pelvic tissues and the ovaries (Fig.5) also cause menstrual problem [12].

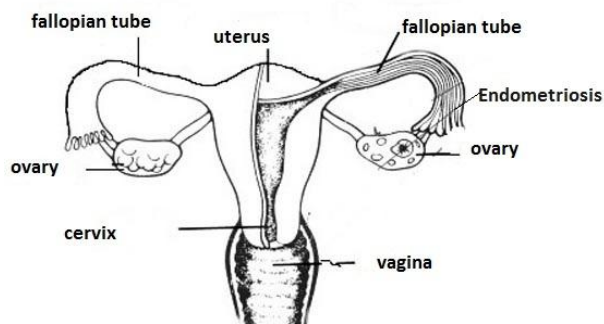


Fig.5: Endometriosis [12]

- Pregnancy-related conditions are the most common causes of abnormal bleeding amongst women from the age of 20 to 40. Pain may accompany the abnormal bleeding. A late and/or painful, heavy period may be an early miscarriage or a 'blighted ovum' where the foetus fails to develop normally.

Few Symptoms of Menstrual disorder

Three most common symptoms present on both days, that is, the day before and first day of menstruation were lethargy and tiredness (first), depression (second), and inability to concentrate on work (third), other possible symptoms are Nausea or vomiting, Excess perspiration, Loose stools, Increase in the frequency of urination, Dizziness, Loss of appetite, Mood swings, Uneasiness.

Complication associated with menstrual problem

- *Anemia (reduction in red blood cells)*

Menorrhagia is the most common cause of anemia in premenopausal women. A blood loss of more than 80mL (around three tablespoons) per menstrual cycle can eventually lead to anemia. Most cases of anemia are mild. Nevertheless, even mild anemia can reduce oxygen transport in the blood, causing fatigue and a diminished physical capacity. Moderate-to-severe anemia can cause shortness of breath, rapid heart rate, lightheadedness, headaches, ringing in the ears (tinnitus),

irritability, pale skin, restless legs syndrome, and mental confusion [13].

- *Osteopenia (loss of bone density)*
Amenorrhea caused by reduced estrogen levels is linked to osteopenia. Conditions that are associated with low estrogen levels include eating disorders, pituitary tumors, and premature ovarian failure.
- *Osteoporosis (more severe bone loss that increases fracture risk)*
Osteoporosis is a condition characterized by progressive loss of bone density, thinning of bone tissue, and increased vulnerability to fractures. Osteoporosis may result from disease, dietary or hormonal deficiency.
- *Infertility*
Some conditions associated with heavy bleeding, such as ovulation abnormalities, fibroids, or endometriosis, are important contributors to infertility. Many conditions that cause amenorrhea, such as ovulation abnormalities and polycystic ovary syndrome, can also cause infertility [14].

Ways to help treat Menstrual Cramping

1. Nutritional Considerations

Adequate nutrition is very important and since, Dysmenorrhea is an inflammatory state in the body, it is important to avoid foods that increase inflammation response. High glycemic foods are known to increase levels of inflammatory chemicals in the body, including

PGF2. Therefore, food containing an anti-inflammatory activity or anti-inflammatory diet is important.

The food habits that should be practiced to avoid or to get relief from dysmenorrhea are summarized in Table 1.

Table 1: Food habits or food supplement that should be practiced in case of dysmenorrhea

Avoid refined carbohydrates [15].	Stick to whole grains like oats, millet, brown rice, quinoa, etc. Eat only 3 servings of grains at most a day.
Eliminate sugary foods and processed sugar [16].	Choose very limited amounts of honey or agave. Choose Stevia as a sweetener when possible.
Consider eliminating dairy [17].	Dairy products are congesting to the body and many doctors have seen a reduction in menstrual cramp pain in women who eliminated dairy products. If you choose dairy, try to purchase organic or organic raw dairy only to avoid added hormones
Reduce red meat and egg yolk consumption to at most 2-3 times a week [18].	This is because both red meat and egg yolk are high in arachidonic acid (AA). This has been found to increase cellular inflammation

2. Important Nutritional Supplements:

Several studies have indicated that certain vitamins are very effective in reducing the severity of menstrual cramps. Following a healthy diet is very important at all times and

not just during menstrual cycle. However, healthy foods can help restore energy levels and reduce lethargy, tiredness, weakness and fatigue. Some of the foods that should be included in a diet for menstrual cramps given in Table 2.

Table 2: Daily requirement of nutritional supplements for menstrual disorders

Vitamin A	Vitamin A is an important nutrient in the growth and development of adolescents and ensures healthy endometrial growth. Women with normal menstrual loss appear to have significantly better levels of vitamin A than women with menorrhagia. When the women with heavy menstrual loss were given vitamin A [19].
Magnesium	Magnesium supplements reduce PMS symptoms such as aches and pains, depression, irritability, mood swings and fluid retention. Magnesium helps to relax smooth muscle tissue. It has been shown to reduce menstrual cramping greatly[20].
Omega-6 essential fatty acids (EFAs)	Borage oil and Evening Primrose Oil are high in Omega-6 fatty acids. Omega-6 fats can assist fertility by improving reproductive cell structure, decrease risk of inflammation and improve the condition of organs in the body. Borage and EPO tone the uterus [21].
Fermented Cod Liver Oil	Provides many of the necessary building blocks for hormone production including Vitamins A, D, and K. It also is a great source of Omega-3s and beneficial fats [22].
Gelatin	Is a great source of calcium, magnesium and phosphate? It supports hormone production and digestive health and helps sooth inflammation, especially in joints [23].

3. Herbal Support for Dysmenorrhea:

Medicinal herbs are significant source of dysmenorrheal drugs. Mono and poly-herbal preparations have been used in various disorders. According to one estimate, more than 700 mono and poly-herbal preparations in the form of decoction, tincture, tablets and

capsules from more than 100 plants are in clinical use. A drug having beneficial effect on the heavy bleeding during menstruation is known as anti dysmenorrheal drug. There are a number of herbs that can affect the activity of the uterine muscle, some are listed in Table 3

Table 3: List of common herbs used in uterine disorder

Scientific name	Common name (English)	Parts used	Method of use
<i>Rubus idaeus</i> L.; Rosaceae	Red raspberry	Leaf	Make a strong cup of raspberry leaf tea and added into it the juice of an orange. Take 3 cups of this mixture daily during menstruation if pain is occurred [24].
<i>Ocimum basilicum</i> L.; Lamiaceae	Basil	Leaf	Add 15 ml of basil leaves extract to one cup of boiling water. Cover tightly and allow it to cool. Drink this every few hours to relief cramps [25].
<i>Cinnamomum zeylanicum</i> J. Presl.; Lauraceae	Cinnamon	Bark	Cinnamon is hot and aromatic herb, and it is taken at a dose of up to 1 g three times per day as an infusion, or as part of a herbal tea formula at a dose of between 2–4 ml, three times daily [26].
<i>Foeniculum vulgare</i> Mill.; Apiaceae	Fennel	Seeds	Adding 4 gm of fennel seeds to a cup of boiling water simmer the mixture on low heat for five minutes then removed from heat and strain the tea and add honey and mix well. Drink this herbal tea two times daily beginning three days before the expected start date [27].
<i>Zingiber officinale</i> Roscoe; Zingiberaceae	Ginger	Rhizome, ginger root	Ginger can be taken as a fresh or decoction of rhizome or as tincture. The extract (tincture) is taken at a dose of 2.5–3 ml depending on strength. During menstruation lower doses preferable [28].
<i>Valeriana officinalis</i> L.; Valerianaceae	Valerian	Leaves	2 ml of valeriana tincture is taken every 3-4 hours as needed for pain [29].
<i>Viburnum opulus</i> L.; Honeysuckle	Cramps Bark	Bark	1ml of bark tincture taken every 2-3 hours during cramps [30].
<i>Viburnum prunifolium</i> L.; Caprifoliaceae	Black haw	Bark	Tincture of black haw is taken at a dose of 1ml every 2-4 hours during menstruation [31].
<i>Cimicifuga racemosa</i> L.; Ranunculaceae	Black Cohosh	Dried root	The usual dose of Black cohosh is between 1ml–2 ml of tincture, two to three times daily used during menstruation [32].
<i>Leonurus cardiaca</i> L.; Lamiales	Motherwort	Fresh /dried leaves	The fresh or dried leaves of Motherwort is used in the infusion form and the recommended dosage is 2–6 ml of 1 in 5 tincture or 2–4 ml of 1:1 fluid extract, and taken three times daily before

<i>Piscidiaerythrina</i> L; <i>Fabaceae</i> .	Jamaican dogwood	Root bark	expected date of menstruation [33]. It is a Cooling herb and it is used at a dose of between 2–8 ml three times per day during cramps [34]
<i>Hypericumperforatum</i> L; <i>Hypericaceae</i>	St John's wort	Leaf	The tincture of this herb is taken at a doses of range from 2–8 ml per day during menstruation[35].
<i>Matricariachamomilla</i> ;Asteraceae	Chamomile	Leaf	One cup of boiling water is poured into a cup containing a chamomile tea bag.Cover and let it steep for 10 to 15 minutes. Squeeze out the tea bag and add some lemon juice or honey as desired.then drink at least two cups ofchamomile tea a day during the week before menstrual period [36].
<i>Petroselinumcrispum</i> L; <i>Apiaceae</i>	Parsley	Leaf	The fresh leaves of parsley is Pour in one cup of boiling water and then it steep for five minutes. Strain the solution and drink the tea immediately.Drink this tea twice a day during periods to minimize pain[37].
<i>Pulsatilla vulgaris</i> L; <i>Ranunculaceae</i>	Pasque Flower	Whole herb	The herb pasque is as Warm with a Cooling potential. The tincture (dried plant) is taken at a standard dose of 1–2 ml of the daily during periods[38].
<i>Tanacetumparthenium</i> L; Asteraceae	Feverfew	Leaf	The effective dose of feverfew herb can use quite low at 50–100 mg per day if pain is occurred[39].
<i>Ligusticumstriatum</i> DC; <i>Apiaceae</i>	Cnidium	Rhizomes.	Cnidiumis acrid and warm herb and it is used as a fluid extract it can be taken at doses of 2–6 ml, one to three times per day during periods[40]
<i>Achilleamillefolium</i> L; <i>Compositae</i>	Yarrow	Whole Herb	Yarrow herb is taken by makingtea and it is prepared by covering 15 g of the dried herb with boiling water and infusing overnight. After straining, the tea is taken in divided doses over the next day during times of heavy menstruation[41].
<i>Alchemilla vulgaris</i> L; <i>Rosaceae</i>	Ladies' mantle	Root or herb	This herb should be used at the high end ofthe dose range: 1.5–2.5 ml three times daily to reduce menorrhagia[42].
<i>Hydrastis Canadensis</i> L; <i>Ranunculaceae</i>	Golden seal	Rhizomes	The tincture of Golden Seal rhizome is used at a dose of 1ml–2 ml, three times dailyto reduce the pain [43].

4. Benefits of Aroma therapy for Painful Menstrual Cramps

Essential Oil Massage blends or hot compress are another form of pain relief for menstrual cramps. The aromatherapy massage that should be performed each day between periods lead to a significant reduction in the number of days of menstrual pain. Below are some of the best aromatherapy for painful cramp.

- **Heat**
Applying heat on the lower abdomen is the easiest way to control menstrual cramps. Heat helps relax the contracting muscles in the uterus. Alternatively Place a heating pad over the lower part of abdomen and lower back or alternatively use a plastic bottle filled with hot water and apply the heat until the pain is reduced [44].
- **German Chamomile** (*Matricaria chamomilla*L; Asteraceae)
German chamomile oil is best known for its ability to reduce inflammation. This oil is a deep blue in color due to the presence of azulene. It also has some pain reducing effects, promotes calming of the nerves, reduces anger, irritability and depression which are very common symptoms during menstruation [45].
- **Sweet Marjoram** (*Origanum marjorana*L; Lamiaceae)
This is also a great oil for menstrual cramps it reduces pain on all levels. For better result it is use with a hot compress on the abdomen when menstrual cramps occur [46].
- **Sweet Fennel** (*Foeniculum vulgare* Mill; Apiaceae)
The essential oil of fennel have the ability to assist in promoting menstruation (menses) and regulating the monthly discharge, but although these oils are

very helpful in treating problems of pain associated during menses.

- **Lavender oil** (*Lavandula latifolia*; Lamiaceae)
This essential oil obtained by distillation from the flower spikes of certain species of lavender, *Lavandula latifolia* can relieve anxiety, depression and pain during menstruation [47].
- **Clary Sage oil** (*Salvia Sclarea*L; Labiatae)
The Essential Oil of clary is extracted by steam distillation from the buds and leaves of the Clary Sage plant of *Salvia Sclarea*, it regulated menstrual cycles, and alleviated symptoms of menopause [48].

5. Physical activity for menstrual disorder:

Regular physical activity is very important for promoting the flow of qi in the body. A lack of exercise can increase the severity and duration of symptoms associated with dysmenorrhea. In addition to a regular physical exercise regimen, a good moving meditation can help balance the emotions, reduce stress, strengthen the organs, and regulate menstruation. Regular exercise, including exercise right before and during your menstrual cycle can and will help lessen the severity of menstrual cramping. Swimming can also lessen menstrual flow, and lessen cramps [49].

6. Self Acupressure for menstrual pain

Acupressure and reflexology are alternative medicine techniques that are based on the theory of holistic self-healing using solely physical pressure. The pressure applied at specific points helps in increasing the flow of life energy through the meridians and clears the blockages. PMS or premenstrual syndrome is a batch of symptoms that are linked with the menstrual it can surely disrupt normal life of a woman for a few days. Acupressure therapy

can be used to treat the symptoms of PMS quite successfully. Below listed some of the most important points ranging from various parts of the body that are useful for acupressure treatment of premenstrual syndrome.

- **Points on Abdomen**

The most important acupressure treatment points for relieving PMS symptoms is located in the abdomen like Mansion Cottage(In the pelvic area, in the middle of the crease where the leg joins the trunk of the body), Rushing Door(In the pelvic area, in the middle of the crease where the leg joins the trunk of the body), Sea of Energy(Two finger widths below the belly button).stimulating these points by applying soft pressure using palms and fingers can help in relieving menstruation related discomfort[50].

- **Points on the Back**

A few of the acupressure points related to PMS are located on the back of the body such as Womb and Vitals (This pair of points are located right outside the sacrum – the bony area at the base of the spine, midway between the hipbone and the base of the buttocks), Sacral Points(These points are located in the sacrum, right at the base of the pelvis),and stimulating these points not only helps in relieving abdominal cramps, but also soothes lower back pain[51].

- **Points on Legs**

The reflexology points present on the legs such as Three Yin Crossing (Four finger widths above the inner anklebone close to the back of the shinbone), Grandfather Grandson(In the upper arch of the foot, one thumb width from the ball of the foot) are help in improving blood flow to the lower part of the body and helps in reducing bloating by driving out excess fluid from the body[52].

- **Point on Arms**

One of the most important points of acupressure therapy– the Union Valley point, there stimulation of which helps in treating a wide range of health problems.**Union Valley Point**(This acupressure point is located in the fleshy joint between the thumb and index finger on both hands). Stimulating this point by applying pressure on the fleshy region helps in normalizing delayed and irregular periods, calms the uterine muscles and treats infertility [53].

CONCLUSION

In this review we discussed about medicinal plants and some alternative home remedies for the treatment of menstrual disorder. Menstrual problem (i.e *Dysmenorrhea*, *Amenorrhea*) is a chronic disease which leads to various complications on long standing. Allopathic medicines are not effective in treating the disease leading to various adverse effects. Hence medicinal plants are the best alternative for the treatment of menstrual problem. The plant species have proved their efficacy in reducing problem. Folklore medicinal plants are mostly used for rural areas; because the availability of lavish amount of medicinal plants those areas.

CONFLICT OF INTEREST STATEMENT

The authors declare that they have no conflict of interests.

REFERENCES

1. Biggs WS, Demuth RH. Premenstrual syndrome and premenstrual dysphoric disorder. *Am Family Phys* 2011; 84(8): 918-924.
2. Casablanca Y. Management of dysfunctional uterine bleeding. *Obstet Gynecol Clin North Am* 2008; 35(2):219-234.

3. Laufer A, Breech MR. Menstruation in girls and adolescents: using the menstrual cycle as a vital sign. *Pediatrics* 2006; 118(5): 2245–2250.
4. Silverthorn, Dee Unglaub. *Human Physiology: An Integrated Approach*. Glenview, IL: Pearson Education; 2013, p 850.
5. Menstruation and the menstrual cycle fact sheet. USA: Office of Women's Health; 2014.
6. Osayande AS, Mehulic S .Diagnosis and initial management of dysmenorrhea. *Am Family Phys* 2014; 89 (5): 341–346.
7. Cho SH, Hwang EW. Acupuncture for primary dysmenorrhea: a systematic review. *BJOG* 2010; 117(5):509-521.
8. Bhattacharya S, Middlestone LJ, Tsourapas A, Lee AJ, Champaneria R, Daniels JP. Hysterectomy, endometrial ablation and Mirena for heavy menstrual bleeding; a systematic review of clinical effectiveness and cost-effectiveness analysis, *Health Technol Assess* 2011; 15 (19): 1-252.
9. Mitchell C, Prabhu M. Pelvic inflammatory disease: current concepts in pathogenesis, diagnosis and treatment. *Infect Dis Clin North Am* 2010; 27 (4): 793-809.
10. Wallach EE, Vlahos NF. Uterine myomas: an overview of development, clinical features, and management. *Obstet Gynecol* 2004; 104 (2): 393–406.
11. Matalliotakis I, Kourtis A, Panidis D. Adenomyosis, *Obst Gynecol Clin North America* 2003; 30(1): 63-82.
12. Bulletti C, Coccia ME, Battistoni S, Boini A. Endometriosis and infertility. *J Assist Reprod Genet* 27(8): 441–447.
13. Kaunitz AM, Meredith S, Inki P, Kubba A, Sanchez-Ramos L. Levonorgestrel-releasing intrauterine system and endometrial ablation in heavy menstrual bleeding. A systematic review and meta-analysis. *Obstet Gynecol* 2009; 113(5):1104-16.
14. Uriel H. History and trajectory of PMS towards a balanced adaptation and a biosocial homeostasis. *J Repro Infant Psychol* 2006; 24(4): 336-346.
15. Usuki S, Nakauchi T, Higa S, Someya K. The Improvement of luteal Insufficiency in Fecund Women by Tokishakuyakusan treatment. *The Am J Chinese Med* 2002; 30 (2,3): 327-338.
16. Balbi C, Musone R, Menditto A. Influence of menstrual factors and dietary habits on menstrual pain in adolescence age. *Eur J Obstet Gynecol Reprod Biol* 2000; 91(2): 143-148
17. Penland JG, Johnson PE. Dietary calcium and manganese effects on menstrual cycle symptoms. *Am J Obstet Gynecol* 1993; 168: 1417-1423.
18. Dennehy CE. The use of herbs and dietary supplements in gynecology: an evidence-based review. *J Midwifery Womens Health* 2006; 51(6): 402-406.
19. Brabin L, Brabin BJ. The cost of successful adolescent growth and development in relation to iron and vitamin A status. *Am J Clin Nutr* 1992; 55(5): 955-958.
20. Guerrera MP, Volpe SL, Mao JJ. Therapeutic uses of magnesium. *Am Fam Physician* 2009; 80(2): 157-162.
21. Sohrabi N, Kashanian M, Ghafoori SS, Malakout SK. Evaluation of the effect of omega 3-fatty acids in the treatment of premenstrual syndrome. *Complement Ther Med* 2013;21(3);141-146
22. Bope and Kellerman: *Conn Current Therapy* 2013. 1st ed. Philadelphia, PA: Elsevier Saunders; 2012.
23. Yuichiro I, Shuji I, Akira K, Eisuke K, Makiyo H, Seiji K, Toyohiro O, Tsuneo I. Uterine artery embolization by use of porous gelatin particle for symptomatic uterine leiomyomas. *Japanese J Radiol* 2015; 33(8): 461-470.

24. Burn JH, Withell ER. A principle in raspberry leaves which relaxes uterin muscle. *Lancet* 1941; 2(6149): 1–3.
25. Khodayari N, Moatar F. Efficacy of traditional medicine for the treatment of primary dysmenorrhoea. *Iran J Pharm Res* 2004; 3:37-43.
26. Akhavan Amjadi M, Mojab F, Shahbaz-Zadegan S. Effect of *Cinnamomum zeylanicum* on the severity and systemic manifestations of dysmenorrhoea. *Med J Arak Uni* 2009; 9: 204-209.
27. Ghodsi Z, Asltoghiri M. The effect of fennel on pain quality, symptoms, and menstrual duration in primary dysmenorrheal. *J Pediatr Adolesc Gynecol* 2014; 27(5): 283-286
28. Mascolo N, Jain R, Jain SC, Capasso F. Ethnopharmacologic investigations of ginger (*Zingiber officinale*). *J Ethnopharmacol* 1989; 27 (1–2):129–140.
29. Mirabi P, Doulatian M, Mojab F, Alavimajid H. Effect of *Valeriana officinalis* on the systemic manifestations of dysmenorrhoea. *Int J Gynecol Obstet* 2011;115:285-288.
30. Jarboe C, Schmidt C, Nicholson J and Zirvi K. Uterine Relaxant Properties of *Viburnum*. *Nature* 1966; 19:837-846.
31. Evans W, Harne W, Krantz J. Menstrual cramps; An Herbal approach. 1942; 174-177.
32. Jarry H, Harnischfeger G, Duker E. Studies on the endocrine efficacy of the constituents of *Cimici fugaracemosa*, *In vitro* binding of constituents to estrogen receptors. *Planta Med* 1948; 4(9):94-98.
33. Weiss RF. *Herbal Medicine*, AB Arcanum. London: Gothenburg, Sweden and Beaconsfield; 1988, p 279.
34. Costello CH, Butler CL. An investigation of *Piscidiaerythrina* (*Jamacia dogwood*). *J Am Pharm Assoc* 1948; 37(3): 89-97.
35. Van Gorp G, Meterissian GB, Haiek LN. St John's wort or sertraline Randomized controlled trial in primary care. *Can Fam Physician* 2002; 48: 905-912.
36. Barene I, Daberte I, Zvirgzdina L, Iriste V. The complex technology on products of German chamomile. *Medicina* 2003; 39: 127-131.
37. Wang ZL, Sun PP, Li TX. Pulsatilla decoction treat inflammatory bowel disease by activating NLRP3. *Zhong Yao* 2012; 35 (8): 1280-1286.
38. Anil P, Manish S, Garvendra S, Vijay B. Feverfew (*Tanacetum parthenium*). *Systemic Rev* 2011; 5 (9): 103-110.
39. Hoffmann D. *Thorson's Guide to Medical Herbalism*. UK: Thorson's; 1991, p146.
40. Chandler RF, Hooper SN. *Ethnobotany and phytochemistry of Yarrow, Achillea millefolium*, *Compositae*. *Econ Bot* 1982; 36(2): 203-223.
41. Jonadet M, MeunierM, Villie T. Flavonoids extracted from *Ribiesnigrum* L and *Alchemilla vulgaris* L, I. *In vitro* inhibitory activities on the enzyme elastase, trypsin and α -chymotrypsin. II. Angio protective activities compared *in vivo*, *J Pharmacol* 1986;17(1): 21-27.
42. Zargari A. *Medicinal plants*. 4th ed. Tehran: Tehran Univ. Pub; 1982, p 651.
43. Jamieson DJ, Stegge JF. The prevalence of dysmenorrheal, dyspareunia, pelvic pain and irritable bowel syndrome in primary care practices. *Obstet Gynecol* 1996; 87: 55-58.
44. McIntyre A. *The Complete Woman's Herbal*. Rydalmere, NSW: Hodder Headline Australia Pty Ltd.; 1995, p 110.
45. Graz B, Savoy M, Buclin T, Bonvin E. Dysmenorrhea: patience, pills or hot-water bottle. *Rev Med Suisse* 2014;10 (452):2285-2288.
46. Ali-Shtayeh MS, Yaniv Z, Mahajna J. Ethnobotanical survey in the Palestinian area, a classification of the healing potential of medicinal plants. *J Ethnopharmacol* 2000; 73(1-2):221-232.

-
47. Pimple BP, Patel AN, Kadam PV, Patil MJ. Microscopic evaluation and physicochemical analysis of *Origanum majorana* Linn leaves. *Asian Pacific J Trop Dis* 2013; 13(2):897-903.
48. Henley DV, Korach KS. Physiological effects and mechanisms of action of endocrine disrupting chemicals that alter estrogen signaling. *Hormones* 2010; 9(3):191-205.
49. Smith CA, Zhu X, He L, Song J. Acupuncture for primary dysmenorrhoea. *Cochrane Database Syst Rev* 2011;19: 1-7.
50. Wayne PM, Kerr CE, Schnyer RN, Legedza AT, Savetsk-German J, Shields MH, Buring JE, Davis RB, Conboy LA, Highfield E, Parton B, Thomas P, Laufer MR. Japanese-style acupuncture for endometriosis-related pelvic pain in adolescents and young women. *J Pediatr Adolesc Gynecol* 2008;21: 247-257.
51. Chen HM, Chen CH. Effects of acupressure at the sanjinjiao point on primary dysmenorrhoea. *J Adv Nurs* 2004; 48:380-387.
52. Helms JM. Acupuncture for the management of primary Dysmenorrhea. *Obstet, Gynecol* 1986; 69(1):51-56.
53. Jonas WB, Jacobs J. Healing with Homeopathy. *The Doctors' Guide*. New York: Warner; 1996, p 185.

Cite this article as:

Monawara Begum, Sumit Das, H.K. Sharma. Menstrual Disorders: Causes and Natural Remedies. *J Pharm Chem Biol Sci* 2016; 4(2):307-320.