



A REVIEW ON PRIMARY DYSMENORRHEA: RECENT TRENDS IN PRIMARY DYSMENORRHEA REMEDY

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ABSTRACT

Alternative and Therapeutic system of medicines around the world depends on nature having diverse variety of plants with renowned metabolites and propitious biological activity. Since there is a quest in isolating newer compounds from plants, large number of plants are constantly being screened for their potent pharmacological activity. Many herbs are used in alleviating the symptoms of primary dysmenorrhea, but were transmitted orally among generations. Whereas, the herbs that were mentioned to have anti-dysmenorrhoeal activity were not validated scientifically. Primary dysmenorrhea is a recurrent menstrual cramp without any disease background in the uterus. It was proven that prostaglandin F2 alpha was key aspect for the symptoms during primary dysmenorrhea. This review article describes various treatment modules used since earlier time. Most of the regimen modules except non-steroidal anti-inflammatory drugs allay the symptoms of primary dysmenorrhea. Non-steroidal anti-inflammatory drugs antagonizes cyclo-oxygenase enzyme which is an ideal component for synthesis of prostaglandins. Non-steroidal anti-inflammatory drugs causes many aftereffects. In this review article various therapeutic modes were explained and herbs that were used traditionally for treating primary dysmenorrhea were unveiled.

Key words: Primary dysmenorrhea, alternate remedies, herbs with anti-dysmenorrhoeal activity.

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INTRODUCTION

The word “dysmenorrhea” makes its origination in the English verbal around 1810 (Smith et al., 2002). Amenorrhea and dysmenorrhea were to Egyptian practitioners as abnormal conditions. Dysmenorrhea was also recognized by Greek philosopher Hippocrates, according to him dysmenorrhea occurs due to termination of flowing of menstrual blood, which causes painful menstrual cycle but it does not occur when the menstrual flow is regular and adequate in quantity (Morre et al., 1993).

According to Hippocrates, delaying of motherhood may be one of the causes of uterus disorder.

An ancient song about dysmenorrhea is mentioned in Dhanvandi vaithiyam first part in page number 187 under the heading of karpa suronitham.

திரண்டு புரண்டு கீழ் வயிற்றில் திங்கள்
முழுக்க இல் வலியுண்டா

மருந்து குருதி குறுகி வரும் வாய்நீருறு
மயங்கிவருந்

திரண்டு சிலநாட் சிக்கிநிற்கும் திறமாங்
கருவை யழிப்பிக்கு

முருண்ட கர்ப்பச் சுரோணிதமென்
றுரைக்குங் குணங்கண் டறிவீரே.

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The song itself describes dysmenorrhea. Every month women will have an unbearable pain in the lower abdomen but the flow is not increased. Increased saliva secretion and drowsiness will be felt. These are the symptoms of dysmenorrhea.

Menstrual cycle is defined as cyclic event that takes place in a rhythmic fashion during the reproductive age of a women's life. Menstrual cycle starts at the onset of puberty. 75% of female folks are affected by menstrual pain in their life time. Although amenorrhea, abnormal uterine bleeding, dysmenorrhea, and premenstrual syndrome are common throughout reproductive life, the predominant cause of these problems' changes with maturation. (Gail B. Slap 2008).

Dysmenorrhea is defined as pain associated with menstrual cycle which affects millions of women of reproductive age. Prevalence of menstrual pain is common in the world and ranges from 45-90%. Dysmenorrhea can be classified into primary dysmenorrhea and secondary dysmenorrhea. Primary dysmenorrhea is associated with ovular cycles in the absence of pathological findings. It affects 20-90% of women of reproductive ages. (De Sanctis *et al.*, 2015) Secondary dysmenorrhea is caused by pelvic pathology such as endometriosis outflow tract obstruction. (Gail B. Slap 2008).

MECHANISM OF PAIN PRODUCTION

The Obstructive theory: acute bend in the uterus causes obstruction to the blood outflow, worsen by premenstrual congestion, the retained blood results in irregular, spasmodic and painful contractions occurs (*Sir Jeffcoat 1995*) As per Ayurveda this obstruction is caused due to *vata*.

The Hypoplasia theory: the under developed muscle of pre pubertal uterus with long cervix unable to expel the menstrual blood, retained blood sets up painful contractions (*McClure Browne 1973*) due to *alpa mamsa dathu*.

Disturbed Polarity of uterus: painful menstruation is due to retained blood in the uterus due to changes in the polarity of the uterus. (*McClure Browne 1973*) due to *apana vata* which causes *viloma gati* of *Rajas*.

Clotting of the menstrual blood: According to this view dysmenorrhoea may be caused by clotting the menstrual blood (*baddha artava*), the clots being then difficult to expel (*Davis 1938*) (due to *kapha*)

The muscle ischemia theory: It is suggested that the pain is due to ischemia of the uterine muscle during exaggerated uterine contractions (*Davis 1938*)

Low pain threshold, General ill health (*alpa sara*).

Pathophysiology

Due to hyper contraction of myometrium, tissue ischemia and hypersensitivity of pain nerve terminals in the uterine cavity. Secretion of **prostaglandin F₂α** in the

endometrium is responsible for the symptoms of dysmenorrhea. Symptoms of dysmenorrhea are headache, vomiting, backache, diarrhea, dizziness, and fatigue. (Gail B. Slap 2008)

Treatments Available For Dysmenorrhea

- Home remedies
- Yoga
- Herbal remedies
- Allopathy
- Alternative therapies

Home Remedies

- Applying heat
- Massaging with essential oils
- Healthy diet

Applying Heat

A research has concluded that applying heat to lower abdomen and lower back may relieve menstrual pain. 18 to 30 years old women who had regular menstrual cycles found that a heat patch at 104°F (40°C) was as effective as ibuprofen. (Shahindokht Navvabi Rigi *et al.*, 2012)

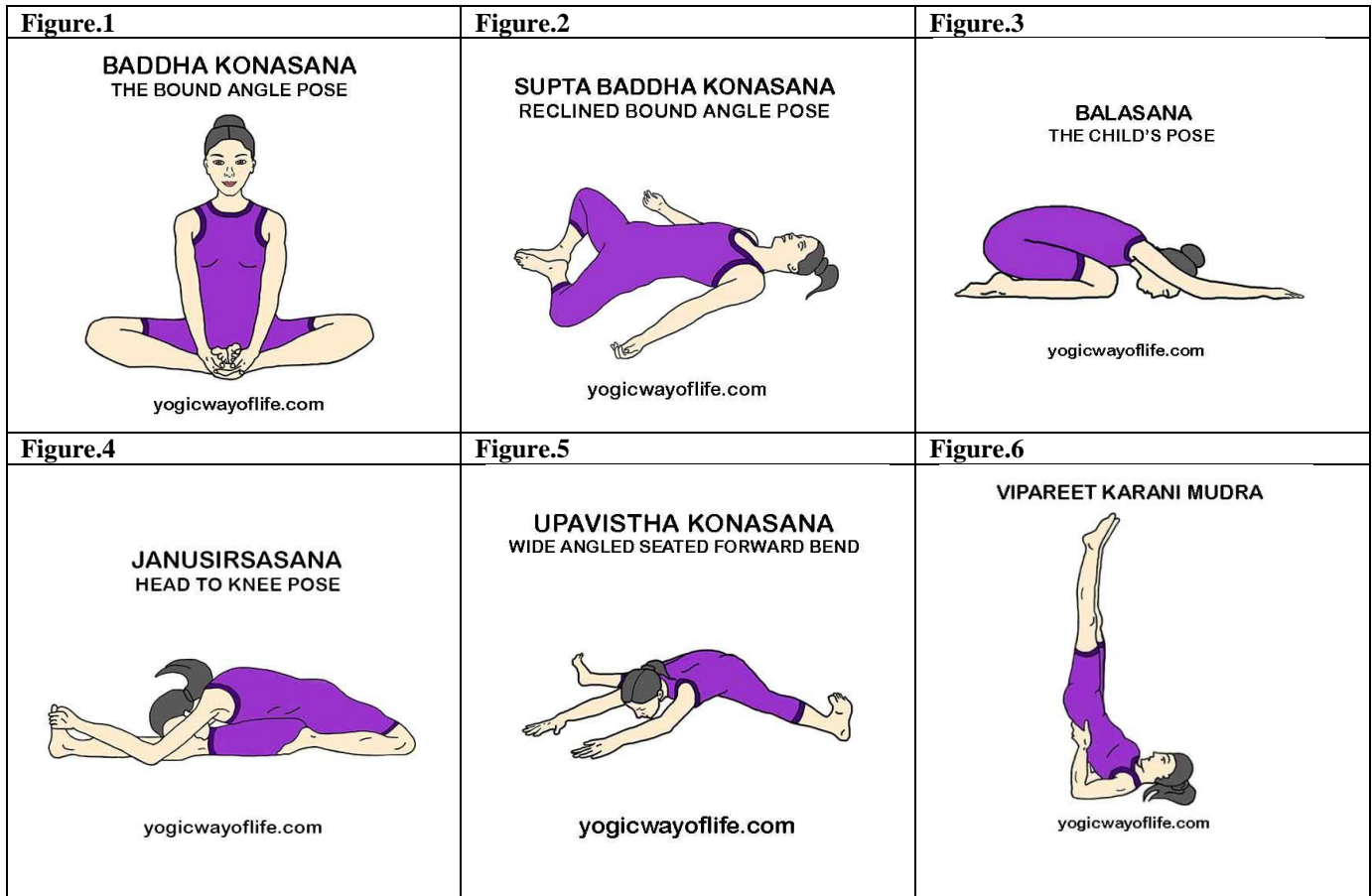
Massaging With Essential Oil

Group of researchers found that massages with essential oil during the time of menstruation significantly reduced pain immediately and subsequently. Massage therapy for menstruation involves pressing specific points while the therapist's hands move around abdomen, side, and back. (Mahboubeh Valiani *et al.*, 2010)

A Healthy Diet

During menstruation, it's a good idea to avoid food that sources bloating and water retention. Fatty foods, Alcohols, Carbonated beverages, Salty foods and Caffeine must be avoided.

- Papaya is rich in vitamins.
- Brown rice contains vitamin B-6, which may reduce bloating.
- Walnuts, almonds, pumpkin seeds and tender coconut are rich in manganese, which eases cramps.
- Olive oil and broccoli contain vitamin E.
- Flaxseed contains omega-3 fatty acid with antioxidant properties, which reduce swelling and inflammation.
- Boron reduces menstrual cramps. Boron is rich in bananas, avocado and peanut butter.
- Water reduces dehydration. Cucumber and watermelon can be taken during cramps.
- Calcium reduces muscle cramping. Dairy products and sesame seeds contain calcium. (Dina abadi bavid *et al.*, 2016).



YOGA

Yoga can actually help ease cramps, headache, anxiety, and other menses-related symptoms. If yoga is practiced for a long time, these benefits will be even more likely but even doing period yoga for 5 minutes can help even your most tenacious period pains vanish. The following asanas may reduce the cramps. (store.lenutte.com)

- Baddha konasana (fig.1)
- Supta baddha konasana (fig.2)
- Balasana (fig.3)
- Upravistha konasana (fig.4)
- Viparita karani (fig.5)
- Janusirsasana (fig.6)

Yoga is a gentle exercise that also releases endorphins and helps in reducing menstrual symptoms. Group of researchers found three different yoga poses — Cobra, Cat, and Fish — significantly reduced intensity and duration of pain during menstruation for young women. (*Zahra Rakhshae 2012*)

Herbal Remedies

These herbs contain anti-inflammatory and antispasmodic compounds that experts believe that the

herbs can reduce the muscle contractions and swelling associated with menstrual pain.

- Chamomile tea increases urinary level of glycine which help relieve muscle spasm. (Janmejai K. Srivastava *et al.*,2010)
- Cinnamon capsule reduces bleeding, pain, nausea and vomiting. (Molouk Jaafarpour *et al.*, 2015)
- Ginger in warm water helps relieving cramps and effective as ibuprofen.(Giti Ozgoli *et al.*,2009)
- 1000 mg Dill is as effective as Mefanamic acid. (Reza Heidarifar *et al.*,2014)
- Coriander has been traditionally used as a remedy for menstrual cramps. (Flores KE *et al.*, 2014)
- Consumption of mint tea reduces pain associated with dysmenorrhea. (Flores KE *et al.*,2014)

Allopathy Drugs

- Simple analgesics
- Non-steroidal anti-inflammatory drugs
- COX-2 specific inhibitor

Table.1. Plants used to treat Primary Dysmenorrhea across the world.

S.no	Traditional drug used	Family	Parts used	Reference
1	<i>Aegle marmelos</i>	Rutaceae.	Fresh fruits or decoction of leaves.	Anonymous
2	<i>Cardiospermum halicacabum</i>	Sapindaceae	Fresh leaves wrapped in betel leaf.	Anonymous
3	<i>Hibiscus rosa sinensis</i>	Malvaceae	Infusion of flower petals.	Embeya <i>et al.</i> ,(2014)
4	<i>Phyllanthus emblica</i>	Phyllanthaceae.	Fruit juice.	Anonymous
5	<i>Trigonella foenum graecum</i>	Fabaceae.	Decoction of leaves or raw seeds.	Sima Younesy <i>et al.</i> ,(2014)
6	<i>Crotalaria verrucose</i>	Leguminosae.	Leaves are used.	Anonymous
7	<i>Grewia flavescens</i>	Tiliaceae.	Root is used.	Sathishkumar and Anbarasu(2019)
8	<i>Themeda triandra</i>	Poaceae.	Root is used.	Sathishkumar and Anbarasu(2019)
9	<i>Achyranthes aspera</i>	Amaranthaceae.	Dried leaves boiled with water.	Wasserheit <i>et al.</i> ,(1989)
10	<i>Leucus aspera</i>	Lamiaceae.	Leaves crushed and juice is taken.	Embeya <i>et al.</i> ,(2014)
11	<i>Pedaliium murex</i>	Pedaliaceae.	Leaf juice is taken orally.	Balamurugan <i>et al.</i> ,(2017)
12	<i>Tephrosia purpurea</i>	Fabaceae.	Dried root powder mixed with honey	Balamurugan <i>et al.</i> ,(2017)
13	<i>Zingiber officinalis</i>	Zingiberaceae	Boiled with water.	Ozgoli <i>et al.</i> ,(2009)
14	<i>Mentha longifolia</i>	Lamiaceae.	Mint tea.	Flores KE <i>et al.</i> ,(2014)
15	<i>Cinnamum camphora</i>	Lauraceae	Bark.	Molouk & Jaafarpour <i>et al.</i> ,(2015)
16	<i>Matricaria chamomilla</i>	Asteraceae.	Chamomile tea.	Janmejai & Srivastava <i>et al.</i> ,(2010)
17	<i>Coriandrum sativum</i>	Umbelliferae.	Stems are boiled in water.	Flores KE <i>et al.</i> ,(2014)
18	<i>Anethum graveolens</i>	Umbelliferae.	Seed powder.	Reza Heidarifar <i>et al.</i> ,(2014)
19	<i>Foeniculum vulgare</i>	Umbelliferae.	Fennel oil.	Zahra Ghodsi, MaryamAsltoghiri (2014)
20	<i>Cocos nucifera</i>	Palmae	Coconut shell fiber extract	Wong 1976
21	<i>Cuminum Cyminum</i>	Apiaceae	Cumin oil	Bharti Goel, Neelesh Kumar Maurya (2019)
22	<i>Neurolaena lobata</i>	Compositae	Infusion of leaf is drunk	McKinnon <i>et al.</i> ,(2014)
23	<i>Rose tea</i>	Rosaceae	Tea	Ying-Fen Tseng (2010)
24	<i>Valeriana officinalis</i>	Caprifoliaceae	Root extract	Zahra Behboodi Moghadam <i>et al.</i> ,(2016)
25	<i>Ananas comosus</i>	Bromeliaceae	Fruit	Bharti Goel, Neelesh Kumar Maurya (2019)

Simple Analgesics

Simple analgesics, such as aspirin and paracetamol, may be useful as a starting point especially when NSAIDs are contraindicated. (Marjoribanks et al.,2003)

Non-Steroidal Anti-Inflammatory Drugs

The different formulations of NSAIDs have similar efficacy for dysmenorrhea, and pain relief is achieved in most female folks. Between 17% and 95% of women achieve pain relief with an NSAID. Gastrointestinal effects such as nausea, vomiting, and/or diarrhea are side effects with NSAIDs. Effects are generally tolerable, but women with risk factors for NSAID induced ulceration, the potential risks and benefits of using an NSAID should be considered. Women with a history of gastroduodenal ulcer, gastrointestinal bleeding, or gastroduodenal perforation should probably seek alternatives. (Marjoribanks J et al.,2003)

Cox-2 Specific Inhibitor

A review of the newest generation of anti-inflammatory agents has shown that COX 2 (cyclooxygenase-2) specific inhibitors are effective for dysmenorrhea. Questions about the cardiovascular and cardioprotective safety of COX 2 inhibitors remain unresolved, however, and these drugs have been withdrawn from use in many countries. (Michelle Proctor et al.,2006)

Alternative Therapies

- Transcutaneous electrical nerve stimulation
- Acupuncture
- Vasopressin antagonists
- Nitroglycerin
- Magnets

Transcutaneous Electrical Nerve Stimulation

Transcutaneous electrical nerve stimulation (TENS) involves stimulation of the skin using current at

various pulse rates (frequencies) and intensities to provide pain relief. (Proctor ML et al.,2002)

Acupuncture

Acupuncture excites receptors or nerve fibers, which, through a complicated interaction with serotonin and endorphins, block pain impulses. (Proctor ML et al.,2002)

Vasopressin Antagonist

Overproduction of vasopressin, a hormone that stimulates the contraction of muscular tissue, has been identified as a contributing factor to dysmenorrhea. vasopressin antagonist given as a dose of 300 mg/day starting between four hours to three days before the onset of pain and/or bleeding significantly reduced pain compared with placebo. No serious adverse effects were noted. (Brouard R et al.,2000)

Nitroglycerin

Nitric oxide can relax the uterine muscle. Nitroglycerin formulations are currently used to relax the uterus for various pregnancy problems, so it may have implications for dysmenorrhea. One study, in patients with dysmenorrhea, used 0.1-0.2 mg of nitroglycerin taken hourly during first few days of the menstrual cycle and found that pain was reduced in most patients. However, 20% of women reported headaches as an adverse effect and more research is needed. (Transdermal Nitroglycerine/Dysmenorrhea Study Group.1997)

Magnets

A static magnet of 0.27 T attached over the pelvic area, compared with a placebo magnet in women with primary dysmenorrhea showed a significant reduction in pain and irritability symptoms. (Michelle Proctor et al.,2006).

Table 2. Phytochemicals having Anti-Dysmenorrheal Effect

S.no	Parts used/ type of extract	Phytochemical	Pharmacological effect	Reference
1	Methanolic extract of the plant <i>Trigonella foenum-graecum</i>	Tetrahydrocoptisine	Inhibit uterine contraction.	Pei Liu et al.,(2011)
2	Chamomile oil	Berberine	Calcium channel blocker.	Pei Liu et al.,(2011)
3	Chamomile oil	Tetrahydrocolumbamine	Inhibit uterine contraction.	Pei Liu et al.,(2011)
4	Methanolic extract of the seed <i>Trigonella foenum-graecum</i> (100-200mg/kg)	Disogenin.	Reduces anxiety.	Fariba Sharififar et al.,(2009)
5	Ethyl acetate extract of <i>Zingiber</i>	Gingerol	Inhibit prostaglandin	Fumiyuki Kiuchi et

	<i>officinalis</i> rhizome.		biosynthesis.	<i>al.</i> ,(1992)
6	Ethanollic extract of <i>Zingiber officinalis</i> rhizome.	Shagol	Down regulate COX-2 gene expression.	Min-Hsiung Pan <i>et al.</i> ,(2008)
9	Chamomile oil	Spiroether	Relaxes aching, tense muscles and alleviates pre menstrual pain.	Pei Liu <i>et al.</i> ,(2011)

DISCUSSION & CONCLUSION

Dysmenorrhea is a pain associated with menstrual cycle various reasons are found and many modalities of treatments are available to treat dysmenorrhea. NSAID's are widely consumed around the globe. It is also associated with many side effects. Herbs, healthy diet, yoga and adapting to newer techniques that avoids intake of allopathic drugs like analgesic, NSAID and COX inhibitors that causes unavoidable effect can be avoided. Many valuable herbs and novel therapies are unexplored till date. An initiative step towards exploring herbs and other novel techniques is needed to avoid overruling of exotic chemical entities in our organs.

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