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A review on Dysmenorrhea and its Herbal Treatment

Yamini Verma[1], Tilotma Sahu[2]*

[1]Rungta Institute of Pharmaceutical Science, Khoka-Kurud Road, Bhilai - 490024, Chhattisgarh, India.
[2]Rungta Institute of Pharmaceutical Science and Research, Bhilai - 490024, Chhattisgarh, India.

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ABSTRACT: Dysmenorrhea, characterized by painful menstruation, is a common gynaecologic issue affecting the quality of life for many women. This article explores the diagnosis and treatment of dysmenorrhea, emphasizing the role of the interprofessional team. The term encompasses two types: primary, unrelated to underlying pathology, and secondary, linked to a defined disorder. Risk factors include age, smoking, weight management attempts, anxiety, depression, and family history of dysmenorrhea. The etiology involves psychological, biological, and anatomical factors, with prostaglandins playing a crucial role in uterine contractions. Primary dysmenorrhea negatively impacts the quality of life, with symptoms ranging from physical to psychological.Secondary dysmenorrhea can be caused by various conditions like endometriosis, fibroids, and pelvic inflammatory disease. Diagnosis involves a thorough medical history, physical examination, and, if necessary, imaging techniques. Primary dysmenorrhea treatment aims to improve the quality of life and may include NSAIDs, hormonal contraceptives, and non-pharmacological interventions like exercise and heat application.Non-pharmacological options such as heating pads and exercise can provide relief, but evidence supporting herbal medicines, acupuncture, and certain supplements is limited. Transcutaneous electrical nerve stimulation (TENS) is a promising non-invasive option. In severe cases, surgical interventions like laparoscopic uterosacral nerve ablation (LUNA) or hysterectomy may be considered.The article also discusses natural herbal treatments, such as Shatavari, Lodhra, Ashoka, and Udumbar in Ayurveda. These herbs have been traditionally used to alleviate menstrual pain and provide relief from related symptoms.The comprehensive approach to dysmenorrhea involves understanding its types, risk factors, etiology, pathophysiology, diagnosis, and various treatment modalities. The interprofessional team plays a crucial role in managing dysmenorrhea and improving the overall well-being of affected individuals.

Corresponding author:
Ms. Tilotma Sahu
Rungta Institute of Pharmaceutical Science and Research,
Khoka-Kurud Road, Bhilai - 490024,
Chhattisgarh, India.
E. Mail ID: tilu06sahu@gmail.com

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INTRODUCTION:

Pain experienced throughout the menstrual period is known as dysmenorrhea. Usually originating in the lower abdomen, the pain can also spread to the back and inner thighs. It can have a severe effect on a patient's life and is a relatively prevalent gynecologic issue. Offering dysmenorrhea patients therapeutic alternatives can greatly lower the morbidity that comes with it [1]. There are several choices for treatment, some of which a

patient may find more or less beneficial. This exercise goes over how to diagnose and treat dysmenorrhea, or unpleasant menstruation. It emphasizes the part that the inter-professional team plays in diagnosing, treating, and, when necessary, sending individuals in need of specialized care for dysmenorrhea [2].

The Greek word dysmenorrhea means "painful monthly bleeding." There are two types of dysmenorrhea: primary and secondary. Recurrent lower abdomen pain that occurs during the menstrual cycle and is unrelated to underlying pathology or other disorders is known as primary dysmenorrhea [3]. It is an exclusionary diagnosis. Secondary dysmenorrhea, on the other hand, is linked to a possible or well defined disorder. During their reproductive years, patients who are menstruating frequently complain of dysmenorrhea. Significantly detrimental effects on emotional, psychological, and functional health may be linked to dysmenorrhea [4].

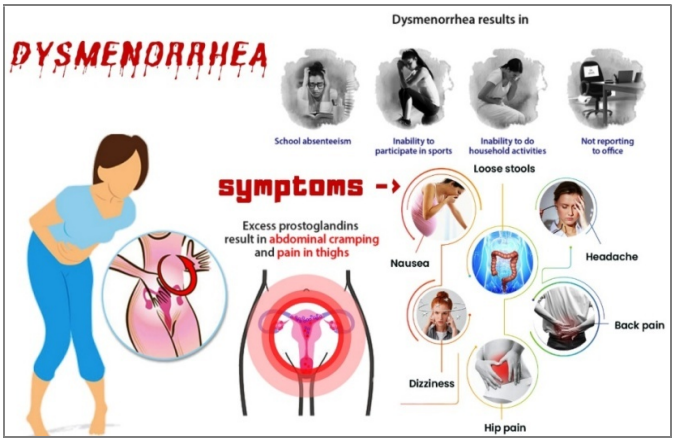

Fig 1. Dysmenorrhea.

ETIOLOGY:

Numerous theories have been put out to explain the genesis of dysmenorrhea since the 1960s. These hypotheses include etiologies that are psychological, biological, and anatomical. The anatomical theory highlights anomalies in the length or form of the cervix as well as improper uterine position [5]. In their research, Zebitay et al. suggested a favorable relationship between the volume and severity of dysmenorrhea and cervical length. Several other investigations have found that the biochemical explanation provides the strongest supporting data [6].

The following are risk factors linked to dysmenorrhea [7]:

- Age (typically) up to thirty years.
- The act of smoking.
- Attempts to reduce body weight.
- BMI that is higher or lower than average.
- Anxiety and depression.
- Extended menstrual cycles.
- Lower menarche age.
- Complete parity.
- Past incidents of sexual assault.
- Unfinished uterine scar healing from a previous cesarean section (uterine niche)
- More extended and intense menstrual flow.
- History of dysmenorrhea in the family.

CAUSES OF DYSMENORRHEA [8]:

- Endometriosis: It is a condition in which the tissue lines of the uterus start growing outside the uterus and other parts of female reproductive areas such as a fallopian tube, bladder, and ovaries.
- Fibroids: These are the uterine fibromas, a tumor which is developed in the uterus. This is also one of the major causes of dysmenorrhea. Almost 20 to 25 % of women of reproductive age have this problem.
- Pelvic inflammatory disease (PDI): It is an infection in the female reproductive organ due to sexually transmitted bacteria.
- Ovarian cyst: Sometimes the cyst develops in your ovaries which may cause painful periods.
- Being overweight.
- High level of prostaglandin, which causes uterus contraction.
- Narrow cervix
- Sexually transmitted infection.

PATHOPHYSIOLOGY:

Even so, the etiology of dysmenorrhea remains incompletely understood. Moreover, recent data indicates that elevated prostaglandin F2α (PGF2α) and prostaglandin E2 (PGE2) secretion in the uterus during endome is responsible for the etiology of dysmenorrhea trial sloughing. These prostaglandins contribute to the uterine ischemia and anaerobic metabolite synthesis by enhancing myometrial contractions and vasoconstriction. Pelvic discomfort eventually comes from the hypersensitization of pain fibers caused by this [9].

Prostaglandin synthesis occurs via the cyclooxygenase (COX) route, which mediates the arachidonic acid cascade. Progesterone levels control arachidonic acid production by acting on the activity of phospholipase A2, a lysosomal enzyme. The middle of the luteal phase, which is the latter part of the menstrual cycle that follows ovulation, is when the progesterone level peaks. The corpus luteum degenerates and the level of progesterone in the blood drops in the event that conception is unsuccessful [10]. Progesterone levels are rapidly

declining, and this is linked to endometrial sloughing, menstrual bleeding, and the release of lysosomal enzymes, which produce arachidonic acid and prostaglandins [11].

In the late luteal phase, endometrial prostaglandin levels are higher in women who have regular menstrual cycles. Nevertheless, a number of investigations that assessed prostaglandin levels in the luteal phase, using menstrual samples and endometrial biopsies, showed that dysmenorrheic females had more prostaglandin levels than eumenorrheic females. As a result, there is a clear correlation between increased endometrial concentrations of (PGF2α) and (PGE2) and period cramps, pain intensity, and related symptoms [12].

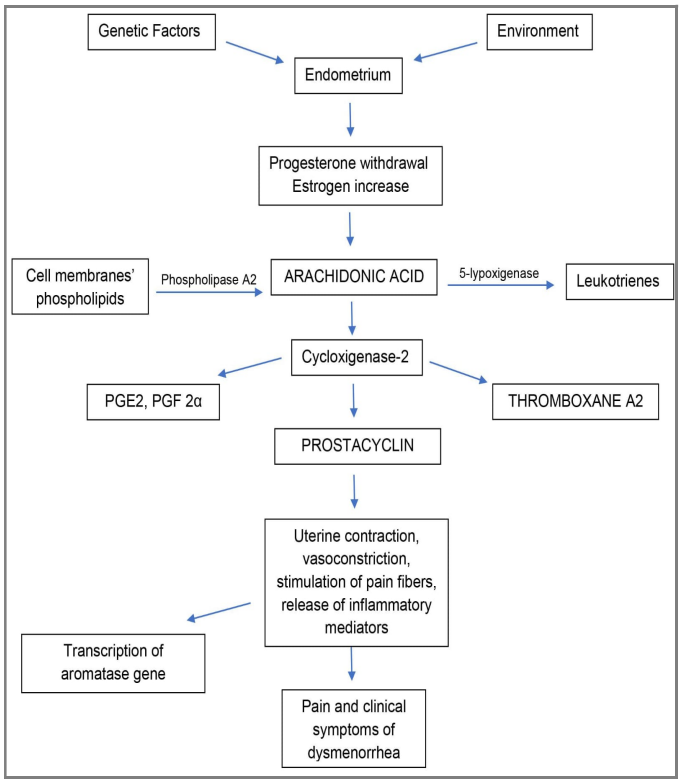

Fig 2. Pathophysiology of Dysmenorrhea.

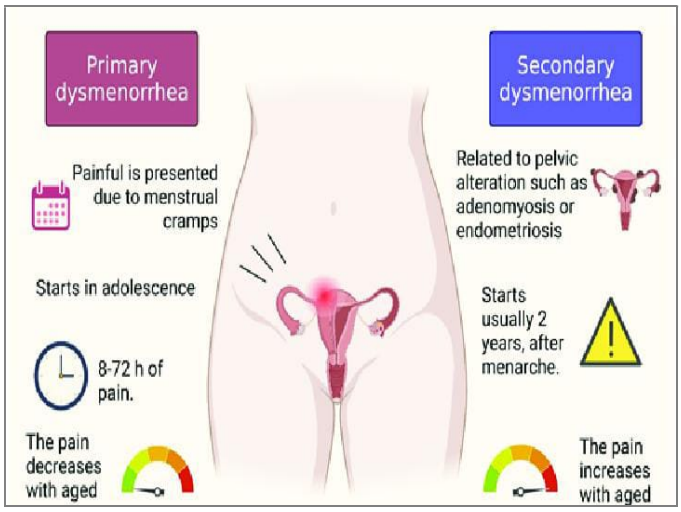

Fig 3. Primary & Secondary Dysmenorrhea.

Primary dysmenorrhea:

Primary dysmenorrhea (PD) is a common, disregarded, underdiagnosed, and inadequately treated complaint of both young and adult females [13]. It is characterized by painful cramps in the lower abdomen, which start shortly before or at the onset of menses and which could last for 3 days. In particular, primary dysmenorrhea negatively impacts the quality of life (QOL) of young females and is the main reason behind their absenteeism from school or work [14]. It is suggested that increased intrauterine secretion of prostaglandins F2α and E2 are responsible for the pelvic pain associated with this disorder. Its associated symptoms are physical and/or psychological. Its physical symptoms include headache, lethargy, sleep disturbances, tender breasts, various body pains, disturbed appetite, nausea, vomiting, constipation or diarrhea, and increased urination, whereas its psychological symptoms include mood disturbances, such as anxiety, depression, and irritability [15]. While its diagnosis is based on patients' history, symptoms, and physical examination, its treatment aims to improve the QOL through the administration of non-steroidal anti-inflammatory drugs, hormonal contraceptives, and/or the use of non-pharmacological aids (e.g., topical heat application and exercise). Patients must be monitored to measure their response to treatment, assess their adherence, observe potential side effects, and perform further investigations, if needed [16].

Secondary dysmenorrhea:

Menstrual pain brought on by an underlying illness, condition, or structural anomaly inside or outside the uterus is known as secondary dysmenorrhea. Women may experience it at any point following menarche. For women in their 30s or 40s, it may be their first-time symptom. Different pain levels and occasionally additional symptoms like dyspareunia, menorrhagia, intermenstrual bleeding, and post-coital hemorrhage might be linked to secondary dysmenorrhea [17]. Secondary dysmenorrhea can be caused by a variety of common conditions, such as endometriosis, adenomyosis, big cesarean scar niche, fibroids, endometrial polyps, pelvic inflammatory disease, and possibly the use of an intrauterine contraceptive method. The prevalence of endometriosis in women with dysmenorrhea may reach 29 %. Up to 35 % of patients with NSAID-resistant dysmenorrhea may also have

endometriosis. Another prevalent underlying condition is adenomyosis [18].

DIAGNOSIS OF PRIMARY DYSMENORRHEA:

Obtaining a thorough medical history and doing a physical examination to rule out pelvic pathology are the primary methods used to diagnose Parkinson's disease (PD) [19]. The first assessment diagnosis of primary dysmenorrhea entails gathering pertinent sexual, gynecological, menstrual, and medical history. The following details are among the details that should be gathered from the focused medical history: the location of discomfort, the menstrual cycle, the regularity and length of menstrual bleeding, irregular vaginal discharge, the onset and persistence of symptoms related to the age of menarche, and accompanying systemic symptoms. Inquiries males with classic Parkinson's disease symptoms can be identified based only on their medical records, empirical treatment, such as NSAIDs (nonsteroidal anti-inflammatory medicines) and/or oral contraceptives, should be started without a pelvic exam or physical examination [20].Nonetheless, sexually active women who exhibit signs of STDs, pelvic inflammatory disorders, or severe dysmenorrhea should have a pelvic examination.

If the patient experiences irregularities and worsening symptoms, severe symptoms linked to abnormal menstrual bleeding, or an abrupt or delayed onset of dysmenorrhea following menarche, secondary dysmenorrhea should be investigating of symptoms; dyspareunia; an endometriosis family history; or a failure to respond to conventional therapy [21]. If any of these symptoms appear, a pelvic exam is required. In some cases, transvaginal ultrasound or magnetic resonance imaging may also be performed. Findings from a normal pelvic exam may further support the PD diagnosis [22].

TREATMENT OF PRIMARY DYSMENORRHEA:

The primary goal of primary dysmenorrhea treatment is to give dysmenorrheic ladies enough pain relief so they can carry out their regular activities, enhance their quality of life, and reduce their absenteeism from work or school [23]. Potential methods for managing Parkinson's disease (PD) include complementary and alternative therapies that do not include medication. NSAIDs and hormonal contraceptives are the first-line treatments advised for Parkinson's disease (PD) because they prevent prostaglandins from being produced, which is directly linked to menstruation pain and the systemic symptoms that accompany it [24]. The American Academy of Family Physicians recommends starting empiric therapy with hormonal contraceptives or NSAIDs for females with a normal medical history and primary dysmenorrhea presentation. The Society of Obstetricians and Gynecologists of Canada as well as the American College of Obstetricians and Gynecologists endorse this. Nevertheless, there isn't any data supporting the superior effectiveness of hormonal contraceptives or NSAIDs [25]. Before transferring to a different modality of treatment, the patient's adherence to the first modality needs to be evaluated whether it is ineffective or fails after three to six months. It makes sense to combine NSAIDs and hormonal contraceptives if the patient's symptoms don't improve with just one medication class [26].

Shared decision-making between clinicians and patients is also essential to the best management of Parkinson's disease (PD) in order to maximize therapy efficacy and guarantee patient satisfaction and adherence. Hence, in order to deliver patient-centered care, women with dysmenorrhea should be informed about the condition, available treatments, and any possible side effects so they can make an informed decision. Healthcare professionals must to take into account the patient's preferences, choice, and need for contraception as well as any possible side effects and hormone therapy contraindications [27].

Pharmacological Therapies:

***Non-steroidal anti-inflammatory drugs*:**

NSAIDs are reasonably priced anti-inflammatory and analgesics that are most frequently used to treat Parkinson's disease (PD). Because they prevent cyclo-oxygenase from acting, which prevents prostaglandin synthesis, they are regarded as the cornerstone in the treatment of dysmenorrhea. Consequently, in cases where contraception is contraindicated or in females who want to use analgesics, NSAIDs are advised as the first line of treatment [28].

There isn't a better NSAID formulation than another, according to the data that is currently available, but different NSAIDs are about the same safe and effective in treating Parkinson's disease. To ascertain the safety and effectiveness of NSAIDs in Parkinson's disease, a comprehensive analysis of 80 randomized controlled trials involving 5,820 female participants was carried out [29]. It was determined that NSAIDs were not superior for pain relief, but were 4.5 times more effective than a placebo (odds ratio [OR], 4.37; 95 % confidence interval

[CI], 3.76–5.09), and more than twice as effective as paracetamol (OR, 1.89; 95 % CI, 1.05–3.43).33) However, NSAIDs were also linked to negative side effects (OR, 1.29; 95 % CI, 1.11–1.51), such as negative neurological and gastrointestinal consequences (OR, 1.58; 95 % CI, 1.12–2.23) [30].

The effectiveness of an NSAID is predicted by when it is administered. NSAIDs should be started one to two days prior to the anticipated start of menstruation, taken with meals to minimize any negative gastrointestinal effects, taken on a regular dosage schedule, and continued for the first two to three days of bleeding in order to provide the best possible treatment efficacy and safety. It has been demonstrated that starting NSAIDs prior to the onset of the COX-2 cascade leads to total inhibition of prostaglandin synthesis [31].

As a result, delaying the consumption of NSAIDs results in partial or progressive suppression. Swapping out a particular NSAID with one from a different class is another therapeutic option if the patient does not get better with it.

Despite the fact that the majority of females respond well to NSAID medication, 18 % were found to not respond sufficiently to them. If NSAIDs don't work for a female patient, non-pharmacological therapy or hormone-based treatments may be used instead [32].

Hormonal contraceptives:

Unless they are contraindicated, hormonal contraceptives are also regarded as first-line treatment for the treatment of dysmenorrhea. NSAID-resistant or non-responsive dysmenorrheic females who require contraception, for whom the use of contraceptives is permitted, or both are typically advised to take them [33].

It has been demonstrated that hormonal contraceptives inhibit ovulation and endometrial growth, which prevents prostaglandin synthesis. Proven hormonal therapies for Parkinson's disease (PD) include subcutaneous depot medroxyprogesterone acetate, levonorgestrel intrauterine system, combination oral contraceptive (COC), and contraceptive transdermal patches or vaginal rings [34]. The choice of a method is contingent upon several factors, including patient preferences, cost, cycle control, convenience of administration, side effect profile, availability, and ease of administration. In order to avoid breast cancer and venous thromboembolism, clinicians should also assist women in selecting hormonal contraceptives and make sure they are medically qualified to use them [35].

It was revealed that the most often used hormonal contraception among women with dysmenorrhea was the COC of estrogen-progestin. A long-term epidemiological study revealed that COC dramatically reduced the severity of Parkinson's disease [36].

The rate of COC use in dysmenorrheic females has not yet been determined, although a study has revealed that most women use them to prevent pregnancy, with only 14 % using them for non-contraceptive purposes such as, primary and secondary dysmenorrhea [37].

Acetaminophen (paracetamol):

For dysmenorrheic individuals who do not want hormonal contraceptives and cannot take NSAIDs due to gastrointestinal distress, acetaminophen is a tolerable analgesic. It lowers prostaglandin synthesis due to its mild COX inhibitory effect45) and is regarded as a safe analgesic with manageable gastrointestinal side effects. However, acetaminophen is less effective than NSAIDs and hormonal contraceptives in treating Parkinson's disease (PD), according to multiple research examining the effectiveness of various medications. Therefore, it should only be used for mild to severe dysmenorrheic discomfort [38].

Non-pharmacological interventions:

For dysmenorrheic individuals who do not want hormonal contraceptives and cannot take NSAIDs due to gastrointestinal distress, acetaminophen is a tolerable pharmacological analgesic. It lowers prostaglandin synthesis due to its mild COX inhibitory effect and is regarded as a safe analgesic with manageable gastrointestinal side effects. However, acetaminophen is less effective than NSAIDs and hormonal contraceptives in treating Parkinson's disease (PD), according to multiple research examining the effectiveness of various medications. Therefore, it should only be used for mild to severe dysmenorrheic discomfort [39].

Nevertheless, there is disagreement over the data recommending non-pharmacological therapies. Menstrual pain has been shown to be greatly reduced by topical heat application and exercise, with efficacy comparable to that of NSAIDs. Because they are low-cost, proven effective, and rarely cause harm, heating pads and regular exercise should be promoted as complementary or alternative therapies. However, there is not enough data to support the use of herbal medicines, acupuncture, yoga, massage, or nutritional supplements (such omega-3 fatty acids or vitamins B, D, and E) in the treatment of Parkinson's disease.

An excellent non-invasive therapy option for lowering menstruation pain is transcutaneous electrical nerve stimulation (TENS). It is a tiny, battery-powered portable gadget that is put to the surface of the pelvis using adhesive electrodes to produce electrical current [39].

Two distinct pathways mediate its analgesic action. In the first mechanism, uterine hypercontractility during menstruation reduces pain perception by raising the sensory uterine pain threshold through a series of afferent electrical impulses transmitted via large diameter sensory fibers. In the second mechanism, peripheral nerves induce endorphin release, which attenuates pain. The two primary types of TENS are low-frequency (2–5 Hz) and high-frequency (<50 Hz), with high-frequency TENS being more often utilized due to its proven ability to reduce menstruation discomfort [39].

Surgical interventions:

Surgical interventions include laparoscopic uterosacral nerve ablation (LUNA), presacralneurectomy (PSN), and hysterectomy; in rare cases, these treatments have been suggested for patients with severe dysmenorrhea who do not respond to conventional treatment modalities. LUNA and PSN both involve interrupting cervical sensory pain fibers by transection of afferent nerve fibers in the uterosacral ligaments or pelvis; however, there is not enough data to support the effectiveness and safety of these procedures, so they are unlikely to be advised for the treatment of Parkinson's disease (PD). Additionally, hysterectomy is thought to be a last resort in refractory severe cases, and should be avoided by young girls and women who intend to become pregnant [40].

DIAGNOSIS OF SECONDARY DYSMENORRHEA:

The diagnosis of secondary dysmenorrhea, which refers to painful menstrual cramps due to an underlying medical condition, involves a thorough medical history, physical examination, and often additional testing to identify the specific cause. Here's a general outline of the diagnostic process [40].

Medical history:

The doctor will ask about the patient's menstrual cycle, the nature and timing of the pain, and any other symptoms. They might also inquire about family history, sexual history, and any previous medical treatments or surgeries.

Physical Examination:

A physical exam, including a pelvic exam, is performed to check for any abnormalities in the reproductive organs. The doctor may also conduct a general physical exam to check for signs of related conditions.

Ultrasound:

An ultrasound may be used to create images of the uterus, ovaries, and pelvis to identify abnormalities such as fibroids, cysts, or other structural problems that could be causing pain.

Laparoscopy:

In some cases, a laparoscopy may be recommended. This is a surgical procedure in which a camera is inserted into the pelvis through a small incision to directly visualize the reproductive organs.

Other Imaging Tests:

Additional imaging tests like MRI (Magnetic Resonance Imaging) can be used for further evaluation if needed.

Laboratory Tests:

Blood and urine tests may be conducted to rule out infections or hormonal imbalances.

TREATMENT OF SECONDARY DYSMENORRHEA [41]:

The treatment of secondary dysmenorrhea aims at managing pain and addressing the underlying condition causing the symptoms. Treatment strategies can vary widely depending on the specific diagnosis. Here are some common treatments for conditions associated with secondary dysmenorrhea:

Nonsteroidal Anti-Inflammatory Drugs (NSAIDs):

These medications, such as ibuprofen and naproxen, are often the first line of treatment for managing menstrual pain.

Hormonal Contraceptives:

Birth control pills, patches, vaginal rings, or injections can help regulate the menstrual cycle and reduce symptoms in conditions like endometriosis.

Gonadotropin-Releasing Hormone (GnRH) Agonists and Antagonists:

These drugs can temporarily induce a menopause-like state, reducing estrogen production and symptoms of conditions such as endometriosis. However, they can have significant side effects, including bone density loss.

Progestin Therapy:

Progestin can be taken as a pill, injection, or intrauterine device (IUD) to reduce pain and bleeding.

Danazol:
A drug that suppresses ovulation and reduces estrogen levels, which can help in treating endometriosis, though it has potential side effects.

Antibiotics:
If an infection, such as pelvic inflammatory disease, is the cause, antibiotics are necessary to treat the infection.

Surgery:
For some conditions, such as fibroids or endometriosis, surgery might be necessary to remove the abnormal tissue, relieve pain, and improve fertility. Options might include laparoscopic surgery, myomectomy for fibroids, or, in severe cases, hysterectomy.

Physical Therapy:

Some find relief from pelvic pain through physical therapy techniques that improve pelvic floor muscle function.

Diet and Lifestyle Changes:
Some individuals might find relief from symptoms through changes in diet, exercise, stress management, and other lifestyle adjustments.

Alternative and Complementary Therapies:
Acupuncture, herbal remedies, and dietary supplements might offer symptom relief for some, though it's important to discuss these approaches with a healthcare provider before starting them.

NATURAL HERBAL FOR DYSMENORRHEA TREATMENT:
Ayurveda is the natural healing process in which people get benefits from herbs without any side effects. There are a number of herbs which are helpful during painful periods.

Shatavari (*Asparagus Racemosus*):
Shatavari is one of the best herbs which is helpful during menstrual pain. It also helps the mother to lactate more. The herb shows effective results in females who are suffering from PCOS and irregular periods [42].

Lodhra (*SymplocusRacemosa*):
Lodhra is very effective during bleeding disorder, menstrual pain and diarrhoea. It belongs to *Styraceae* family. The herb contains chemical constituents such as loturine, loturidine, symposide, and stem bark contains proanthocynidin, 3-monoglucifuranosides and whole plants contain glycosides. All these natural constituents help to get relief from menstrual pain. The paste of *Symplocusracemosa* bark is used over the vaginal area this will help to provide protection from vaginal infection [42].

Fig 1. The flowering plant of Shatavari.

Fig 2. The flowering plant *Symplocus racemosa*.

Ashoka (*Saracaindica*):
Ashoka is an Ayurvedic herb which has been used for centuries due to its great medicinal properties towards the gynecological condition. It is used for the treatment of menstrual symptoms such as abdominal cramps and pain [42].

Udumbar (*FicusGlomerata*):
Udumbar is an ayurvedic herb which is used for the treatment of dysmenorrhea and heavy periods. The mixture of leaves powder with honey helps to reduce infection and decoction of leaves is used for getting relief from dysmenorrhea. It shows great anti-inflammatory,

analgesic properties which reduce the inflammation and pain during Menstruation [43].

Fig 3. The flowering plant Ashoka.

Fig 4. The flowering plant *Ficus glomerata.*

CONCLUSION:

The treatment of Dysmenorrhea is a challenging factor. However, many herbs like Udumbar, Ashoka, Lodhra, and Satavari could be effective in safe treatment of Dysmenorrhea. A lot of scientific research is required to explore the various active chemicals that are responsible in treatment of Dysmenorrhea.

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