

An Open Label Randomised Controlled Clinical Study To Evaluate The Effect Of An Ayurvedic Indigenous Drug Compound And Norethisterone Tablet In Induction Of Menstruation

Dr Laxmi Iranna Benur ¹, Dr Usha D T ², Dr Sudharani ³, Dr Suma Patil⁴, Dr. Prathap. T⁵, Dr Raut Deepali Lahu ⁶

^{1,3,4,6} Final year PG Scholar, Department of PG studies in Prasuti Tantra & Stree Roga, JSS Ayurveda Medical College & Hospital, Mysuru

²Professor & HOD, Department of PG studies in Prasuti Tantra & Stree Roga, JSS Ayurveda Medical College & Hospital, Mysuru

⁵Associate Professor, Department of Obstetrics & Gynecology, JSS Medical College & Hospital, Mysuru

Corresponding Author: Dr Usha D T ; Email:ID: benurlaxmi059@mail.com

ABSTRACT

Background: Amenorrhea, the absence of menstruation, is a common gynecological condition causing significant physical and psychological distress. It may be physiological or pathological, the latter resulting from disorders of the endocrine system or the uterine-ovarian axis. The prevalence of amenorrhea is reported to be 3–4% worldwide and 21.3% in India. Modern management commonly employs synthetic progestins such as norethisterone to induce menstruation; however, prolonged use may be associated with adverse effects including weight gain, mood changes, and breast discomfort. In *Ayurveda*, amenorrhea is described as *Nashtartava*, *Anartava*, *Rajonasha*, and absence of *Raja* by various *Acharyas*. The pathogenesis involves improper formation of *Artava* or obstruction of *Artavavaha Srotas* by vitiated *Kapha* and *Vata*. *Acharyas* advocate the use of *Pittavardhaka*, *Agneya*, and *Artavajanana* drugs for the management of *Anartava*. Based on these principles, a combination of four *Artavajanana* drugs—*Jatamamsi*, *Jyotishmati*, *Vacha*, and *Shatapushpa*—was selected for the present study. **Study Design and Objectives:** An open-label, randomized, double-arm controlled clinical study was conducted to evaluate and compare the efficacy of an Ayurvedic indigenous drug compound with Norethisterone Tablet in inducing menstruation. Secondary objectives included assessment the timing of withdrawal bleeding during and after the medication and patient compliance with treatment. **Methods:** Women fulfilled the diagnostic and inclusion criteria were recruited from the OPD and IPD of the Department of Prasooti Tantra and Stree Roga, JSS Ayurveda Hospital, and through camps and referrals. Assessment was based on the appearance of menstrual bleeding, timing of withdrawal bleeding, duration of flow, and amount of bleeding. **Results:** Comparative analysis showed that Group B (Norethisterone) was significantly more effective in inducing menstruation and demonstrated a better safety profile than Group A (Ayurvedic compound) ($p = 0.005$ and $p < 0.001$, respectively). Group A showed a significantly earlier onset of menstruation and a shorter duration of withdrawal bleeding ($p < 0.001$). No significant difference was observed regarding duration of menstrual flow ($p = 0.365$) or amount of bleeding ($p = 0.268$). **Conclusion:** Both the Ayurvedic Indigenous Drug Compound and Norethisterone Tablet were effective in inducing menstruation. Norethisterone showed superior efficacy and safety, whereas the Ayurvedic compound demonstrated earlier menstrual onset and shorter withdrawal duration. Both treatments were comparable with respect to duration and amount of menstrual bleeding

Keywords: Amenorrhea, Anartava, Artavajanana, Shatapushpa, Jyotishmati, Jatamamsi, Vacha, Norethisterone

How to cite this article: Benur LI, Usha DT, Sudharani, Patil S, Prathap T, An Open Label Randomised Controlled Clinical Study To Evaluate The Effect Of An Ayurvedic Indigenous Drug Compound And Norethisterone Tablet In Induction Of Menstruation, Int J Drug Deliv Technol. 2026;16(69s): 1675-1681. DOI: 10.25258/ijddt.16.69s.164

Source of support: Nil.

Conflict of interest: Nil.

INTRODUCTION

The absence of menstruation is called Amenorrhea, it can be classified as physiological and pathological amenorrhea. Physiological amenorrhea like wise in pregnancy, lactation and menopause. Pathological amenorrhea is due to pathology in endocrine or the uterine-ovarian axis. Pathological amenorrhea is commonly seen in day to day OPD's with prevalence rate of 3 to 4%¹ world wide and

21.3%² in India. Progestins (Hormonal pill) are widely used to alter (to induce/to stop) menstruation which are having its own adverse drug reaction like breast discomfort, muscle ache, abnormal vaginal discharge and so on³. As of now there is no ayurvedic formulation practiced for symptomatic treatment in amenorrhea.

*Author for Correspondence: benurlaxmi059@mail.com

An Open Label Randomised Controlled Clinical Study To Evaluate The Effect Of An Ayurvedic Indigenous Drug Compound And Norethisterone Tablet In Induction Of Menstruation

In Ayurveda classics the word 'Artava' denotes two meanings one of them is Antah Pushpa and another one is Bahir Pushpa. Both are interrelated. Bahir Pushpa is outward manifestation of appropriate work of Antah Pushpa which is necessary for conception. Here, the present study deals with Bahir Pushpa that is Menstrual blood⁴. The word Artava is also used in our Shastras in various contexts to refer (Dhatu upadhatu roopa artava) hormones, (Beejaroopa artava) ovum and (rajas) menstrual blood⁵.

Acharyas have mentioned various terms for absence of Artava i.e Nashtartava by Sushruta, Anartava by Vagbhata, absence of Raja by Bhela & Rajonasha by Bhavaprakasha⁶. In Ayurveda, Anarthava as a symptom is taken up as temporary imbalance of the presiding factors like Doshadushtilakshana, or as a symptom of a disease Vyadhilakshana. The pathophysiology of Anartava can be understood as there is no proper formation of artava or their will be kapha and vata obstructs the passage or orifices of channels carrying artava (artava vaha srotas), thus there will be no menstrual discharge⁷. Acharya Sushruta told, the treatment of anartava is to use kaphavatahara and pittavardaka dravyas as like "Artava shonitam tu agneyam"⁸ and even Acharya Vagbhata also mentioned "pittalai upacharet pravartamanam"⁹

So as per references planned to administer pittavardaka(agneya) dravyas for induction of menstruation i.e artavajanana or artava pravatana or rajapavrutti. Now a days the prevalence rate of amenorrhea is increasing day by day may due to unhealthy foods and lifestyle or some other causes. And women seeking treatment like hormone replacement therapy.

Hence there is need for the safe, potent and effective drug for induction of menstruation. So it will be a great boon to the women if it can be replaced by natural remedies with no side effects. Present study conducted to know the effectiveness of an Ayurveda indigenous drug compound and comparing it with effectiveness of tablet Norethisterone in induction of menstruation.

AIMS AND OBJECTIVES OF THE STUDY

A) Primary objective:

- 1.To Evaluate The Efficacy Of An Ayurvedic Indigenous drug compound in induction of menstruation.
2. To Evaluate The Efficacy Of Norethisterone Tablet in induction of menstruation.
3. To Compare The Efficacy Of Oral Administration Of An Ayurvedic Indigenous drug compound Versus Norethisterone Tablet in induction of menstruation.

B) Secondary objective:

To Assess The Heavy Bleeding And Patient Compliance – The Timing Of Withdrawal Bleeding During And After The Medication And Their Compliance With Treatment Will be Considered As Secondary Objective.

MATERIALS AND METHODS

SOURCE OF DATA

a. Literary source: Classical text books of Ayurveda, Text books of Contemporary sciences, Published articles and journals from authentic websites.

b. Sample source: - Subjects fulfilling the criteria for diagnosis and inclusion visited to OPD and IPD's of Dept of Prasooti Tantra and Stree Roga, JSS Ayurveda Hospital, camps and other referrals were considered for the study.

c. Drug source: –

1.Tab. Noretisterone 5 mg was Purchased from GMP Certified Pharmacy.

2. An Ayurvedic Indigenous Drug Compound contains

Jyotishmati – 1 part

Vacha – 1 part

Jatamamsi- 1 part

Shatapushpa- 1part

Trial drug was given in choorna form.

The compound drug was prepared in GMP certified JSS Ayurveda Pharmacy. Three drugs, namely Jatamamsi, Vacha, and Shatapushpa, were procured directly in Choorna form from a GMP-certified (JSS Ayurveda)pharmacy. Jyotishmati, which was not available in Choorna form, was purchased as a raw drug from the local market and authenticated by the Department of Dravyaguna. The raw drug was properly dried and powdered separately under hygienic conditions. Thereafter, all the four drugs in Choorna form were taken in equal quantities, thoroughly mixed to obtain a homogeneous compound formulation, and packed appropriately for administration during the study.

METHODS OF COLLECTION OF DATA

a. Study Design: An open label double arm randomized Controlled Clinical Interventional Study.

b. Sample Size: Total 60 subjects, 30 subjects in each group.

c. Selection Criteria: 60 subjects with Amenorrhea more than 40 days and who fulfilled the diagnostic and inclusion criteria were selected for the study.

d. Diagnostic Criteria: Subjects who were having amenorrhea of more than 40 days irrespective of underlying pathology were selected for the study.

e. Inclusion criteria:

1. Both married and unmarried female with age group of 16-40 yrs.
2. subjects with more than 40 days of amenorrhea.

f. Exclusion Criteria:

1. Amenorrhea due to pregnancy and lactation.
2. Patient with malnutrition (BMI<18.00), anemia (<9gm%),
3. Subjects with Primary amenorrhea.
4. Subjects taking steroid medications or under long term medication for chronic illness.
5. Subjects with known case of GERD.
6. Subjects with known case of premature ovarian failure.

An Open Label Randomised Controlled Clinical Study To Evaluate The Effect Of An Ayurvedic Indigenous Drug Compound And Norethisterone Tablet In Induction Of Menstruation

7. Diagnosed case of reproductive tract Diseases such as Pelvic Inflammatory Diseases, Genital Tuberculosis, Benign and Malignant lesions of

Reproductive organs and other Congenital deformities.

8. Known case of other Chronic illness Like Cardiac diseases, Thyroid Disorders and Diabetes mellitus.

INTERVENTION:

Plan of the study:

- a. 60 subjects fulfilled the diagnostic and inclusion criteria were selected and divided into two groups - Group A and Group B with 30 subjects in each group by Simple randomization method.

- b. Group A(Trial) - Powdered form of Ayurveda compound drugs, 4 gm with equal quantity of honey TID after food for 10 days. Group B(Standard) - Tab. Norethisterone 5 mg 1 Tab BD After food for 7 days.

Intervention period: For GROUP A - 10 days

For GROUP B - 7 days

Assessment schedule: For GROUP A – upto 10 days

For GROUP B – from 8th to 17th day.

Observation - 15 days from the attainment of menstruation.

Total duration of intervention: 17 days.

ASSESSMENT CRITERIA:

Symptoms were evaluated based on subjective parameters.

Subjective parameters:

Induction of menstruation (appearance of bleeding).

Secondary observation :

1) The Timing Of Withdrawal Bleeding During And After The Medication.

2) Duration of flow/bleeding.

3) Amount of bleeding/blood loss.

OBSERVATIONS

Table No. 1: Distribution of subject based on age				
Age (in years)	Number of subjects		Total	Percentage
	Group A	Group B		
16-20	6	1	7	11.6
21-25	16	10	26	43.3
26-30	2	9	11	18.3
31-35	4	6	10	16.6
36-40	2	4	6	10

Table No.2: Distribution of subject based on Locality				
LOCALITY	Number of subjects		Total	Percentage
	Group A	Group B		
Rural	10	17	27	45.00
Urban	20	13	33	55.00

Table No.3 -Distribution of subject based on Marital Status				
MARITAL STATUS	Number of subjects		Total	Percentage
	Group A	Group B		
Unmarried	20	7	27	45.00
Married	10	23	33	55.00

Table No.4: Distribution of subject based on Past Known Case				
PAST K/C/O	Number of subjects		Total	Percentage
	Group A	Group B		
None	12	10	22	36.67
PCOD	17	20	37	61.66
Hyperprolactinemia	1	0	1	1.67

Table No.05-Distribution of subject based on H/O Hormonal Therapy				
H/O HORMONAL THERAPY	Number of subjects		Total	Percentage
	Group A	Group B		
No Hormonal Therapy	18	13	31	51.67
Hormonal Therapy	12	17	29	48.33

Table No.06 -Distribution of subject based on Regularity of Cycle				
REGULARITY	Number of subjects		Total	Percentage
	Group A	Group B		
Regular	7	0	7	11.67
Irregular	23	30	53	88.33

An Open Label Randomised Controlled Clinical Study To Evaluate The Effect Of An Ayurvedic Indigenous Drug Compound And Norethisterone Tablet In Induction Of Menstruation

Table No. 07-Distribution of subject based on Nature of Work				
NATURE OF WORK	Number of subjects		Total	Percentage
	Group A	Group B		
Heavy	0	0	0	0.00
Moderate	20	21	41	68.33
Sedentary	10	9	19	31.67

Table No.08 - Distribution of subject based on BMI				
BMI	Number of subjects		Total	Percentage
	Group A	Group B		
18-20kg/m ²	2	4	6	10.00
20-22kg/m ²	5	3	8	13.33
22-24kg/m ²	3	8	11	18.33
24-26kg/m ²	7	6	13	21.67
26-28kg/m ²	1	0	1	1.67
28-30kg/m ²	5	5	10	16.67
Above 30kg/m ²	7	4	11	18.33

Table No.09- Distribution of subject based on SATVA				
SATVA	Number of subjects		Total	Percentage
	Group A	Group B		
Pravara	18	0	18	30.00
Madhyama	12	30	42	70.00
Avara	0	0	0	0.00

Table No.10- Distribution of subject based on Agni				
AGNI	Number of subjects		Total	Percentage
	Group A	Group B		
Manda	14	13	27	45
Tikshna	8	6	14	23.3
Sama	8	11	19	31.6

Table No.11 - Distribution of subject based on Manasika Bhava				
Manasika bhava	Number of subjects		Total	Percentage
	Group A	Group B		
None	11	10	21	35.00
Chinta	19	20	39	65.00

Table No.12- Distribution of subject based on Diagnosis				
DIAGNOSIS	Number of subjects		Total	Percentage
	Group A	Group B		
Amenorrhea	14	9	23	38.33
PCOD	15	21	36	60.00
Hyperprolact inemia	1	0	1	1.67

RESULTS

1) Induction of menstruation: Result of Chi square test is as follows:

Table no: Result of Chi square test- Induction of menstruation

Induction of menstruation	No	Yes	Test statistic	P value
Group A	7	23	7.925	0.005 (Significant)
Group B	0	30		

In Group A, menstruation was induced in 23 patients (76.7%), while 7 patients (23.3%) did not show induction. In Group B, all 30 patients (100%) showed successful induction of menstruation. The Chi-square test statistic was 7.925 with a p-value of 0.005, which is statistically

significant. This indicates that there was a significant difference between the two groups, with Group B showing better effectiveness in the induction of menstruation compared to Group A.

2) Time of onset of menstruation: Result of Mann Whitney U test is as follows:

Table: Result of Mann Whitney U test- Time of onset of menstruation

Time of onset of menstruation	N	Mean Rank	Test statistic	P value
Group A	23	20.61	198.000	<0.001 (Significant)

An Open Label Randomised Controlled Clinical Study To Evaluate The Effect Of An Ayurvedic Indigenous Drug Compound And Norethisterone Tablet In Induction Of Menstruation

Group B	30	31.90		
---------	----	-------	--	--

The comparison of the time of onset of menstruation between Group A and Group B showed a statistically Highly significant difference (Mann–Whitney U = 198.000, $p < 0.001$). The lower mean rank observed in Group A (20.61) compared to Group B (31.90) indicates that

menstruation occurred significantly earlier in Group A. Thus, although Group B showed a higher success rate in inducing menstruation, Group A demonstrated an advantage in achieving earlier onset of menstruation

3) Duration of flow: Result of Mann Whitney U test is as follows:

Table: Result of Mann Whitney U test- Duration of flow

Duration of flow	N	Mean Rank	Test statistic	P value
Group A	23	24.91	297.000	0.365 (Not Significant)
Group B	30	28.60		

The comparison of the duration of menstrual flow between Group A and Group B showed no statistically significant difference (Mann–Whitney U = 297.000, $p = 0.365$). The mean ranks were comparable between Group A (24.91) and

Group B (28.60), indicating that both interventions had a similar effect on the duration of menstrual flow. Thus, Group A and Group B were equally effective in maintaining the duration of menstrual bleeding after induction of menstruation.

4) Amount of bleeding: Result of Mann Whitney U test is as follows:

Table: Result of Mann Whitney U test- Amount of bleeding

Amount of bleeding	N	Mean Rank	Test statistic	P value
Group A	23	25.17	303.000	0.268 (Not Significant)
Group B	30	28.40		

The comparison of the amount of menstrual bleeding between Group A and Group B showed no statistically significant difference (Mann–Whitney U = 303.000, $p = 0.268$). The mean ranks were comparable between Group A (25.17) and Group B (28.40), indicating that both

interventions produced a similar amount of menstrual bleeding among patients who achieved induction of menstruation. Thus, Group A and Group B were equally effective with respect to the amount of menstrual bleeding.

DISCUSSION

Amenorrhea is a common gynecological condition resulting from disturbances in the hypothalamic-pituitary-ovarian axis, ovarian dysfunction, uterine abnormalities, endocrine disorders, or metabolic factors. In Ayurveda, it can be correlated with Anartava, a condition primarily attributed to vitiation of Vata and Kapha Doshas, leading to obstruction of Artavavaha Srotas and impaired Artava Pravritti. Management therefore aims at correcting the underlying pathology and restoring normal menstruation.

The present study compared the efficacy and safety of an Ayurvedic Indigenous Drug Compound with

Norethisterone tablet in the induction of menstruation. The findings demonstrated that both interventions were effective in inducing menstruation. However, the Norethisterone group exhibited a higher success rate, indicating superior efficacy in achieving menstrual induction. This may be attributed to the established pharmacological action of Norethisterone, which induces withdrawal bleeding through its progestogenic effect on the endometrium.

The Ayurvedic indigenous compound also demonstrated appreciable efficacy with more than three-fourths(76.7%)

An Open Label Randomised Controlled Clinical Study To Evaluate The Effect Of An Ayurvedic Indigenous Drug Compound And Norethisterone Tablet In Induction Of Menstruation

of subjects attaining menstruation. The probable mode of action of the Ayurvedic compound may be attributed to its Vata-Kapha shamaka, Artavajanana, Agnideepana, Srotoshodhana, and Vatanulomana properties. In Ayurveda, anartava is mainly considered a condition of Kapha avarana of Apana Vata, resulting in obstruction of Artava vaha srotas. The Ushna and Tikshna guna of the drugs help remove obstruction from Artavavaha srotas and restore normal downward movement of Apana Vata, thereby inducing menstruation. Modern Pathological Perspective the probable mechanism may include Improvement in pelvic circulation, Stimulation of uterine activity, Correction of metabolic and endocrine imbalance, Enhancement of ovarian function, Endometrial stimulation. Jyotishmati is having katu, tikta rasa, teekshana guna, ushna veerya and katu vipaka¹⁰ helps in vilayana of kapha and alleviating the vata dosha relieving the obstruction, it also helps in agnivardhana, amapachana so there will be proper formation of rasadi dhatu. Artava is the upadhatu of rasa dhatu so there will be proper formation of artava.¹¹

Vacha is an important Artavajanana drug possessing Katu-Tikta rasa, Ushna veerya, and Tikshna guna. It is widely known for its Srotoshodhaka and Vatanulomana properties¹². In Anartava, obstruction of Artavavaha srotas by Kapha prevents normal menstrual flow. Vacha, due to its penetrating and channel-clearing action, removes this obstruction and stimulates Artava pravritti.

Jatamansi is Tridosahara, Medya, Balya. It acts on the samprapti ghatakas of Anartava by balancing Vata, nourishing Rasa and Rakta dhatu, correcting Manovaha srotodushti¹³, reducing stress-induced neuroendocrine imbalance and promoting proper functioning of Artavavaha srotas.

Shatpushpa have Katu, Tikta & Madhura Rasa. Katu Rasa has Agneya (helps in increasing metabolism) properties & Tikta Rasa has Deepana –Pachana properties, which improve Jathragni Daurbalya and form Nirama Rasa Dhatu. Tikta Rasa also has Lekhana properties due to this it works on Avarana. Laghu, Ruksha, Tikshna Guna of Shatpushpa helps in Kapha Shamana¹⁴ which improve Avaranatmaka Dushti (Apana Vayu Dushti) & produce normal flow of menstrual blood. Ushna Virya of Shatpushpa removes Srotoavarodha.¹⁵ The combination of Jatamansi, Jyotishmati, Vacha, and Shatpushpa provides a multidimensional therapeutic approach in the management of Anartava. These drugs collectively act through Deepana and Pachana, Srotoshodhana, Vatanulomana, Artavajanana, Hormonal regulation, Neuroendocrine modulation, Improvement of uterine circulation.

Assessment of safety revealed adverse events in 12 subjects (40%) of Group A, while no adverse events were reported in Group B during the study period. The adverse effects observed in Group A included mild gastritis, epigastric discomfort, and gastric irritation, which may be attributed to the Ushna and Tikshna properties of the Ayurvedic formulation. These symptoms were mild in nature and were successfully managed with supportive treatment. Although no adverse events were observed in Group B, it should be noted that Norethisterone is known to be associated with

certain adverse effects such as nausea, headache, breast tenderness, abdominal discomfort, mood changes, and breakthrough bleeding¹⁶. The absence of such events in the present study may be due to the short duration of treatment, limited sample size, or individual variations among participants. Thus, Group B demonstrated a superior short-term safety profile in this study, whereas the adverse effects observed in Group A were mild, manageable, and likely related to the pharmacodynamic action of the formulation. Jatamansi mainly acts on neuroendocrine and psychological factors, while Jyotishmati and Vacha remove Kapha avarana and stimulate metabolic and reproductive functions. Shatpushpa acts directly as an Artavajanana and uterine stimulant.

In conclusion, both interventions were effective in inducing menstruation. Norethisterone demonstrated superior efficacy and short-term safety, whereas the Ayurvedic Indigenous Drug Compound showed encouraging results with earlier onset of menstruation and comparable duration of flow and amount of bleeding, suggesting its potential role as an alternative therapeutic non hormonal option in women with amenorrhea.

CONCLUSION

Both the Ayurvedic Indigenous Drug Compound and Norethisterone tablet were effective in inducing menstruation. On comparison, Norethisterone tablet was found to be more effective than the Ayurvedic Indigenous Drug Compound in the induction of menstruation. However, the Ayurvedic Indigenous Drug Compound demonstrated a significant advantage in terms of earlier onset of menstruation. Even after withdrawal of treatment, the Ayurvedic Indigenous Drug Compound was found to be comparable to Norethisterone tablet with regard to the duration of menstrual flow and the amount of menstrual bleeding, without affecting the general health status of the patients. Although a few mild adverse effects were reported during the course of treatment with the Ayurvedic Indigenous Drug Compound, they did not adversely influence the overall health condition or treatment compliance of the patients. In contrast, no adverse effects were observed among the subjects treated with Norethisterone tablet.

Hence, the Ayurvedic Indigenous Drug Compound may be considered a promising non-hormonal therapeutic alternative for the management of amenorrhea. Its ability to induce menstruation, promote an earlier onset of bleeding, maintain menstrual characteristics comparable to hormonal therapy, and preserve overall patient well-being highlights its potential as a safe and effective non-hormonal treatment option.

REFERENCE

1. Birmingham, Alabama. Current evaluation of amenorrhea. Evidence from the practice committee of American society for reproductive medicine. :<https://www.sciencedirect.com/science/article/pii/S0015028208035279#:~:text=The%20prevalence%20of>

An Open Label Randomised Controlled Clinical Study To Evaluate The Effect Of An Ayurvedic Indigenous Drug Compound And Norethisterone Tablet In Induction Of Menstruation

- %20amenorrhea%20not,to%204%25%203%2C%204.
2. Sonal Kulshrestha, Prof. Anisa M. Durrani. Prevalence of Menstrual Disorders and Their Association with Physical Activity in Adolescent Girls of Aligarh City ; Original Research Article; International Journal of Health Sciences and Research.
3. Stat Pearls Publishing. Progestins. National Centre for Biotechnology Information (NCBI) Bookshelf. Updated 2024. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK563211/>
4. Rujuta Trivedi, Rakesh kumar Mishra and M. A. Pandya. Role of 'Krishna Tila' and 'Arkapushpa Taila' Uttarbasti in the Management of Artavakshaya: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3215327/>
5. Sushruta Samhita, Sutrasthana, Shonitavarnaneeya adhyaya, 14/10, Available from: [https://niimh.nic.in/ebooks/esushruta/?mod=read\(accessed on 29/9/2021\)](https://niimh.nic.in/ebooks/esushruta/?mod=read(accessed on 29/9/2021)).
6. Dr. Premavati tiwari. The text book of Prasooti Tantra And Stree Roga- vol II page no 168.
7. Dr. Premavati tiwari. The text book of Prasooti Tantra And Stree Roga- vol II page no 169.
8. Sushruta samhita, Dalhana commentary; sutrastana 14th chapter , Verse no. 7; pg no 59.
9. Dr. Premavati tiwari. The text book of Prasooti Tantra And Stree Roga- vol II page no 170.
10. Acharya Priyavratt Sharma Dravyaguna Vigyana, Chaukhamba Bharti Academy Varanasi volume 2nd Reprint, 2011; page no 13 or P.V.Sharma , DravyagunaVijnana Vol. 2. Chaukhambha Bharti Academy Varanasi.
11. Dr. Keerti Yadav, Dr.Vidya Ballal and Mr. Ravi Mundugaru. JYOTISHMATI : AN ARTAVAPRAVARTAKA. International journal of advanced research (ijar); www.journalijar.com; Article DOI:10.21474/IJAR01/9361;DOI URL:<http://dx.doi.org/10.21474/IJAR01/9361>
12. Dr. Sohit Singh, Dr. Manoj Yadav and Dr. Manoj. A Critical review of vacha (Acorus calamus L.) In ayurvedic & modern context; world journal of Pharmaceutical and medical research; <https://www.wjpmr.com/download/article/93022022/1646037457.pdf>
13. Acharya Priyavratt Sharma Dravyaguna Vigyana, Chaukhamba Bharti Academy Varanasi volume 2nd Reprint, 2011; page no 404 or P.V.Sharma , Dravyaguna Vijnana Vol. 2. Chaukhambha Bharti Academy Varanasi.
14. Hegde PL, Harini A. Text book of Dravya guna Vijnana. Vol-3, Reprintedition. Varanasi: Chaukhamba Publications. 2016. Chapter no.5, page no.233.
15. A Text book of Dravyaguna Vijnana volume-1 by Dr. Prakash L.Hegde, M.D. (Ayu.) Dr.Harini A., M.D. (Ayu.) Chaukhamba Publication New Delhi, chapter no.4, page no. 167
16. Huvinen E, Holopainen E, Heikinheimo O. Norethisterone and its acetate—what's so special about them? BMJ Sexual & Reproductive Health. 2021;47(2):102–109