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Role of Kukkutandatwak Bhasma and Pushyanuga Ghanavati in the management of shwetapradara W.S.R. to certain physico-pathological conditions

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Abstract
Shwetapradara is one of the common complaints in gynecological practice. The word Shwetapradara, which is commonly used in practice, is generally found in different contexts of Yoni Roga in the term of Shwetasrava in Ayurvedic classics. Thus, in Ayurvedic literature like Brihatrayee, there is no separate entity of Shwetapradara as a disease. Commentator Chakrapani has explained the word Pandura-Asrigdara as Shwetapradara in his commentary on Cha. Chi. 30/116 (Shleshmika Asrigdara). The present study, deals with Shwetapradara as a disease form and not as a Lakshana. In this present clinical study, total numbers of 121 patients of Shwetapradara Roga from OPD & IPD of I.P.G.T. & R.A., Jamnagar were registered and divided in three groups randomly. In Group a patients were treated with Kukkutandatwak Bhasma, in Group B patients were treated with Pushyanuga Ghanavati and in Group C only placebo treatment was given. The entire test drugs in 250 mg b.i.d. dose, in the form of tablet with Tandulodaka, for duration of 21 days were advised and the effect on the signs and symptoms were assessed before and after treatment noted and also assessed by a specially prepared proforma. It was found that Kukkutandatwak Bhasma treated patients show better result in the disease Shwetapradara.

Keywords: shwetapradara, kukkutandatwak bhasma, pushyanuga ghanavati

Introduction
The advancement of civilization, the increased awareness as well as improved educational status have enabled women to compete with men to attain equality in the society. Perfect health especially reproductive health is an essential pre-requisite for the same. Wide ranges of pathogens are involved in the disease of female reproductive organ due to sexual activity, low socio-economic standard, stress etc.
Among all those complaint, Shwetapradara, the abnormal vaginal discharge is quite frequent met in day to day gynecological practice. It may be physiological or pathological. In physiological excess of vaginal discharge doesn't require any treatment. But, the pathological conditions are involved many infection due to Candida, Trichomonas, gram negative, gram positive etc. organism. So it needs a special attention. Sometimes the general ill health (weight loss, anaemia etc.) may also produce Shwetapradara.
Although, Shwetapradara is neither causes mortality nor morbidity in susceptible women. But this complaint is liable to cause much mental distress, problem of sexual anxiety and even sometimes fear of carcinoma or failure to conceive. Apart from this, it also causes local inconvenience to the patient.
In Ayurvedic literature as everything is in the form of sutras detailed description is not available. They provide some clues, which are to be elaborated.
Regarding the Shwetapradara, there is no separate chapter is allotted in Samhita.
Commentator Chakrapani has explained the word Pandura-Asrigdara as Shwetapradara in his commentary on Cha. Chi.[1]

पाण्डुरे प्रदरे इति श्वेतप्रदरे ..[2]

Shwetapradara is also described as symptom in many of the Yonirogas like Shleshmala, Upapluta etc. Yonivyapada.
Whenever the women suffer from certain pathological conditions the effective treatment is very essential for them. It is hoped that the research work in the field of Ayurveda will create much interest in the medical practice and for scientific investigations of Ayurvedic formulation, which is also a rich mine of principles and medications.
The present study is aimed to find out a method of treatment, which can be easily administered and accepted by the patient.
For the treatment of Shwetapradara many drugs are available. In such recipes, we have selected Kukkutandatwak Bhasma from the reference Rasatantrasara Va Siddha Prayoga Samgraha. [3]
Hingula Marit Kukkutandatwak Bhasma having Yogavahi Guna. This remedy is also beneficial in Pradara Roga because of its Balya, Brihana effect.
In second group, Pushyanuga Ghanavati has been selected.

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स्त्रीणां श्यावारूणं यच्च प्रसह्य विनिवर्तयेत् ..
चूर्णं पुष्यानुगं नाम हितमात्रेयपूजितम् .[4]

All the Dravyas in this formulation are having Kaphaghna, Pittaghna, Kandughna, Jantughna etc. properties. So it is a very effective remedy to cure Shwetapradara. Taking into consideration the uniform dose and the easiness of administration the form of Ghanavati has been selected in the present study.

Thus the present study deals with Shwetapradara as a disease form and not as a Lakshana and was planned to find out a method of treatment, which can be easily administered and accepted by the patient.

Importance of Study

i) The reasons why Shwetapradara has been chosen:

- Due to today's food habits, changing life style etc. many women are suffering from this disease means incidence rate is high.
- Shwetapradara is among the most frequent disorder for which patients seek care from gynecologists. By understanding the patho-physiology of this disease and having an effective approach to their diagnosis.
- Unfortunately, we do not have reliable estimates of the prevalence of genital infection like Shwetapradara from India nor a screening program. The purpose of this study was to screen women at risk for genital tract infection.
- According to center for disease control and prevention, genital infection is the most common Sexual Transmitted Disease (STD) in women. Sometimes, many genital tract infections are asymptomatic and can cause long term morbidity. It may also convert into chronicity, which produce, lots of trouble and psychological upsets in susceptible women. So it is important to screen out that all causative factors like cervicitis, vaginitis etc.
- Shwetapradara, which occurs due to genital tract infection, has been linked to the occurrence of tubal factor infertility and ectopic pregnancy. The medical, social and financial consequences of tubal factor infertility are considerable while in developed countries ectopic pregnancy remains an important cause of maternal mortality in the first trimester of pregnancy. The aim of the study is to determine if there is unequivocal evidence that screening by any method, is effective in reducing both the prevalence of genital tract infection, ectopic pregnancy and tubal factor infertility (International Journal of Gynecology and Obstetrics, India).
- ज्ञानार्थ यानि चोक्तानि लिङ्गानि सङग्रहे .[5]

  means symptoms of a disease may also constitute a disease. Shwetapradara has been described here as a disease form and not only as a symptom.
- Shwetapradara is found to be scattered form all over the Ayurvedic classics.
- Shwetapradara is characterised by an evil in the bud stage.
- In the allied sciences, it is treated with modern medicine, which produces massive side effects.

ii) Why these two drugs have been selected?

- The present study is aimed to find out a method of treatment, which will impart a permanent, easy, effective and less side effect producing care, which can be easily administered and accepted by the patient.
- Even though some progress has been made in treating this disease, the recurrence is still there. This recurrence has lead once again in search of long standing treatment, without recurrence, with the present day demand when one looks at the Ayurvedic classics finds that Ayurveda has contributed a lot of drugs and methods of treatment to the ailing humanity. Among them, we have selected above mentioned drugs which have a minimum dose which is easy to take by the patients.
- Both drugs are in the form of tablets, so dose maintenance is to be perfect.
- Both drugs don't having any bitter etc. taste, so it is again very easy to take by the patient.
- Pushyanuga Ghanavati is in the form of Ghana rather than Churna, so that the dose of medicine is reduced and there is no question of taste also.
- Kukkutandatwak Bhasma is easily available animal origin calcium and low cost without any toxic effect. It is also having a property like Yogavahi, Upashoshana, Sangrahi, Stambhana etc. Karma, which directly effects on disease Shwetapradara.
- Both drugs are widely described as treatment of Shwetapradara in various Ayurvedic classics.
- Both the drugs are available in low cost. Both recipes are simple and efficacious.
- Now a day, when other system like modern medicine has failed to treat some disease or recurrence is often more, people look for Ayurvedic medicine, which have a permanent cure without any side effect.

Aims and Objectives

- To study the detailed etiopathogenesis of the disease Shwetapradara.
- To compare the disease Shwetapradara with similar clinical entities of modern medical science.
- To evaluate the clinical efficacy of selected drugs on Shwetapradara.
- To find out a simple and efficacious recipe for Shwetapradara.
- To study the complications if any after the treatment.

Criteria for Selection of Patient

- The patients having complaints of excessive white discharge through vagina.
- Those patients who are satisfying diagnostic criteria of Shwetapradara.
- Only married patients were under taken for this study.
- Patients having symptoms like Yonisrava with Arati, Katishula, Yonikandu, etc. were selected.

Criteria for Exclusion of Patient

- Pregnant women were excluded.
- The patients having genital malignancy, polyps, fibroid were excluded.
- Patients of diabetes, hypertension etc. were excluded.

Materials and Methods

For the present study, three type of material have been utilized viz. the literary material, clinical material and the laboratory materials.

Conceptual Study

Different Ayurvedic and modern texts, research papers, modern and Ayurvedic journals etc. were referred for the conceptual part which is includes:

A) Anatomical consideration of Stri Sharira (Yoni)

To know proper patho-physiology and management of any disease, the knowledge of anatomy and physiology of concern organ is very necessary.

This section deals with the Stri Sharira – i.e. Yoni and Garbhashaya from Ayurvedic point of view as well as modern point of view.

B) Physiology Consideration of Yoni

This section mainly deals with physiology of vagina from Ayurvedic and modern view.

Ayurvedic view

The life span of human being is mainly divided into three stages

- Balavastha (childhood)
- Madhyamavastha (adult age)
- Vriddhavastha (old age)

During Madhyamavastha energy, potency, strength, working capacity, understanding, retention power, memory, vocabulary, analysing capacities and all the Dhatus are fully developed and mature, psychology is stable. But in female, there is a major anatomical and physiological change occurs during middle age. Woman is mature to achieve conception and this maturity can come even earlier if she is free from disease and has good diet. This stage is called puberty.

Stri Shukra

A white mucoid substance from the Yoni secreted during the sexual act, which is described as Strishukra by Acharya Sushruta [6] and Acharya Vagbhatta. But Acharya Vagbhatta clearly mentioned that this Stri Shukra is incapable for conception. This may be correlated with Bartholin's glands secretion or this may be physiological vaginal discharge secreted during coitus or sexual excitement.

अपत्यानां मूलं नार्याः परं नृणाम् . [7]

God has gifted women with rare and unique phenomenon of giving rise to offspring. To effectively fulfill the above aim, nature has conferred special anatomical and physiological characteristics in the women which are collectively referred to as "A#i)kr Biv: " i.e. presence of uterus and ovum etc., Rajasrava, Stanyuktata etc. All these Strikarabhavas develops at appropriate period or age means during Yuvavastha.

Modern View

Secretion of Vagina

- The vaginal secretion is very small in amount sufficient to make the surface moist.
- The secretion is mainly derived from the glands of the cervix, uterus, transudation of the vaginal epithelium and Bartholin's glands.
- The vaginal secretion consists of tissue fluid, epithelial debris, some leucocytes (never contains more than an occasional pus cells) electrolytes, proteins and lactic acid (in a concentration of 0.75%).
- Normal vaginal secretions are also composed of vulvar secretions from sebaceous, sweat, Bartholin's and Skene glands, transudate from the vaginal wall, exfoliated vaginal and cervical cells, cervical mucous, endometrial and oviductal fluids and microorganisms and their metabolic products.
- Apart from this, it contains many a pathogenic organism including Cl. Welchii.
- The type and amount of exfoliated cells, cervical mucous and upper genital tract fluids are determined by biochemical process that are influenced by hormone level.
- Vaginal secretions may increase in the middle of the menstrual cycle because of an increase in the amount of cervical mucous. This cyclic variation do not occurs when oral contraceptives are used and ovulation does not occur.
- In this way, normal vaginal secretions are floccular in consistency, white in color and usually located in the dependent portion of the vagina i.e. posterior fornix.

Various changes in vaginal tissues

- The vaginal desquamative tissue is made up of vaginal epithelial cells that are responsive to varying epithelial cells that are responsive to varying amounts of estrogen and progesterone. Superficial cells the predominant cell type in women of reproductive age, predominate when estrogen stimulation is present. Intermediate cells predominate during luteal phase because of progestogenic stimulation. Parabasal cells predominate in the absence of either hormone, a condition that may be found in post-menopausal women who are not receiving hormone replacement therapy.

Doderlein's Bacillus

- It is a rod shaped gram -ve bacillus, which grows anaerobically an acid media.
- It appears in the vagina 3 - 4 days after birth and disappears after 10-14 days. It appears again at puberty and disappears after menopause.
- It probably comes from the intestine.
- Its presence is dependent to estrogen and its function is to convert the glycogen present in the vaginal mucosa into lactic acid. So that the vaginal pH is maintained towards acidic side. The acidic pH prevents growth of the other pathogenic organisms.

Vaginal pH

- The vaginal squamous epithelium responds to ovarian hormones, the cells become rich in glycogen, which provides a medium for the resident lactobacilli of Doderlein.
- The glycogen content is highest in the vaginal fornix to the extent of 2.5-3.0 mg and is lowest in the lower third being 0.6-0.9 mg.
- As a result of the lactic acid production of these bacilli the pH of the vagina is normally acidic (pH = 4 - 4.5)
- The pH is more towards acidic during child bearing period and ranges between 4.0 – 5.5 with average of 4.5.
- The pH is highest in upper vagina because of contaminated cervical secretion (alkaline).
- These factors include vaginal pH and the availability of glucose for bacterial metabolism. The pH of the normal vagina is lower than 4.5, which is maintained by the production of lactic acid.
- Vaginal acidity is protective against infections. It depends mainly on estrogen.
- Vaginal acidity is reduced when there is lack of estrogen at pre-puberty, postpartum period and postmenopausal status.
- Vaginal pH is reduced by seminal fluid, menstrual blood, douching and progestin therapy.

- The vaginal pH varies during different phase of life which is given as below:
  - Birth to 10 days - 4.9 to 5.7
  - From childhood to puberty - Neutral or alkaline
  - Just near to puberty - 4.5
  - During reproductive life - 4.5 to 5.0
  - During pregnancy - 3.8
  - During menopause - 7.0 to 7.8
- Variation in pH is reported in 1955 by Karl Johen and Karmkay in different conditions as follows:
  - Normal vaginal pH - 3.8 to 4.2
  - Four hour after coitus and Douche - 4.5 to 4.7
  - Trichomonas vaginalis - 5.5 to 6.5
  - Candidiasis - 5.0 to 6.5
  - Cervical erosion - 5.1 to 7.5

Thus an admixture of the vaginal, the cervical and the endometrial discharges as well as the estrogen production are too important factors on which the vaginal acidity depends very much. Secondly the conversion of glycogen in the exfoliated squamous epithelial cells to lactic acid by the Doderlein's bacilli depends on estrogen. So totally the pH of the vagina depends mainly on two things – (1) Vaginal flora, (2) The availability of oestrogen – this occupies clinical importance.

Disease Review

The disease review deals with general view of Shwetapradara starting with etymology and historical review, further Nidana Panchaka, Chikitsa etc. of this disease from Ayurvedic concept is described. In the modern concept of disease review detail description of causative factors, types, related investigation and management of leucorrhoea is explained.

Drug Review

In such recipes, we have selected Kukkutandatwak Bhasma from the reference Rasatantrasara Va Siddha Prayoga Samgraha [8]

In second group, Pushyanuga Ghanavati has been selected, instead of Pushyanuga Churna, we are using Pushyanuga Ghanavati and ingredients of Ghana are same as Churna.

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Compound Drug Study

Drug review with highlight on Compound and Individual drugs has been described.

I) Kukkutandatwak Bhasma-

Shodhana of Ashuddha Kukkutanda Twak:

Ref.: Ra. Ta. Sa. Va Si. Pra. Sa. Part-I [10]

Ingredients

1) Kukkutanda Twak	1 part
2) Saindhava Lavana	1/8th part
3) Navasadar	1/8th part
4) Water	Q.S.

Procedure

- Firstly, water was boiled and Saindhava Lavana and Navasadar added to it making it into solution.
- In the above solution the Kukkutanda Twak pieces were mixed thoroughly and kept for 48 hours.
- Then it is strained; inner cover of the Twak pieces is removed and kept in the Sun for drying.
- The dried Kukkutanda Twak pieces are fined grind in a grinder.

Shodhana of Hingula

Ref.: Rasa Tarangini [11]

Ingredients:

1) Ashuddha Hingula	1 part
2) Nimbu Swarasa	Q.S.

Procedure

- A Hingula is powdered in Khalva Yantra.
- Nimbu Swarasa is added to it and Mardana done till it gets completely dried.
- In this way seven Bhavana were given.
- At the end of the Hingula is washed till its sourness is lost and dried in Sun.

Preparation of Kukkutandatwak Bhasma

Ref.: Ra. Ta. Sa. Va Si. Pra. Sa, Part-I [12]

Ingredients:

1) Shuddha Kukkutanda Twak	1 part
2) Shuddha Hingula	1/8th part
3) Changeri Swarasa	Q.S.
4) Kumari Swarasa	Q.S.

Procedure

- Shuddha Kukkutanda Twak Churna was kept in a Sharava, Changeri Swarasa added to it till it gets completely immersed, another Sharava is used to cover this; Sharava Samputa made and subjected to Gajaputa.
- After Swanga Sheeta white soft Bhasma is collected from Sharava.
- To the above white Bhasma, 1/8th part of Shuddha Hingula is added, Bhavana done in Kumari Swarasa, Chakrika made, dried and subjected to Gajaputa.
- In this way adding 1/8th part of Shuddha Hingula to each Puta and giving Kumari Swarasa Bhavana, four Putas were given.
- After Swanga Sheeta white Mrita Bhasma is procured from the Sharava.
- 250 mg tablets are made of the above Bhasma.

II) Pushyanuga Ghanavati:

Ref.:

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चूर्णं पुष्यानुगं नाम हितमात्रेयपूजितम् .[१३]

Ingredients

Sr.	Drugs	Qty.	Sr.	Drugs	Qty.
01	Patha	1 part	14	Lodhra	1 part
02	Jambu	1 part	15	Shuddha Gairika	1 part
03	Amra	1 part	16	Katvanga (Shyonaka)	1 part
04	Pashanabheda	1 part	17	Maricha	1 part
05	Rasanjana	1 part	18	Sunthi	1 part
06	Ambashtha (Patha)	1 part	19	Mudvika (Munakka)	1 part
07	Shalmali Shlesha (Mocharasa)	1 part	20	Rakta Chandana	1 part
08	Samanga (Manjistha)	1 part	21	Kataphala	1 part
09	Vatsaka (Kutaja)	1 part	22	Vatsaka (Indrayava)	1 part
10	Bahlika (Nagakeshara)	1 part	23	Ananta (Sariva)	1 part
11	Ativisha	1 part	24	Dhataki	1 part
12	Bilva	1 part	25	Madhuka (Yashtimadhu)	1 part
13	Musta	1 part	26	Arjuna	1 part

Note: In second group, instead of Pushyanuga Churna, we are using Pushyanuga Ghanavati and ingredients of Ghana are same as Churna.

Preparation of Pushyanuga Ghanavati

- Yavakuta Churna of all the drugs are made, four times water is added to the whole and reduced to 1/4th, thus preparing Kwatha by Kwatha Vidhi.
- This Kwatha is subjected to Mandagni till the entire water content is evaporated and it turns into Ghana form.
- Then the Ghana is dried in sunlight.
- Dried Ghana is made into granules and from that 250 mg Pushyanuga Ghanavati in tablet form is prepared.

Note - Test formulations were prepared by Pharmacy, Guj. Ayu. Uni. Jamnagar.

Individual Drug Study

The ingredient drugs of the chosen formulation is expanded in this section with respect to the botanical source, vernacular names, *Rasa Panchaka*, officinal part, chemical constituents and related established pharmacological actions.

Clinical Study

In the clinical study, total numbers of 121 patients of Shwetapradara Roga from OPD & IPD of Hospital, I.P.G.T. & R.A. Jamnagar were registered. Out of which 101 patients completed the course of the treatment with follow up, whereas 20 patients left the treatment Against Medical Advice.

Investigation

- Haematological Investigation specially Hb, TC, DC, ESR, Blood sugar (if required).
- Routine & Microscopic examination of Urine and Stool
- Vaginal pH test and wet vaginal smear examination.
- Vaginal swab for culture examination, vaginal cytology, A.F.B. examination of vaginal discharge (If needed).

Management of patient

Groupings

Registered patients were randomly divided into three groups viz.

Group A: Treated with Kukkutandatwak Bhasma
Group B: Treated with Pushyanuga Ghanavati
Group C: Treated with Placebo (Wheat flour)

Dosage form, dose, Anupana and route were same in all three groups and given as below -
Dosage form: Tablet
Dose: 250 mg b.i.d.
Anupana: Tandulodaka
Route: Oral

Duration of Treatment

21 days in all the three groups and then the result was assessed on the basis of before and after treatment data.

Follow Up

Patient was observed for one month after completion of treatment.

Pathyapathya

- Pathya Ahara: Laghu, Supachya Ahara etc.
- Pathya Vihara: Harsha, Prashannata, light work etc.
- Apathya Ahara: Guru, Snigdha etc. Kaphavardhaka Ahara.
- Apathya Vihara: Diwaswapna, Shoka etc.

Criteria for Assessment

- **Subjective Criteria:**
  - The effect was assessed on improvement in signs and symptoms of disease on patients.
- **Objective Criteria**
  - Changes in the pH.
  - Pathological changes in routine blood, urine, stool and vaginal smear investigations.
  - In the case of cervical erosion, the time taken for the healing or the improvement in the same.
  - A detailed proforma was prepared with a special scoring pattern for signs and symptoms to assess the improvement in disease condition.

Observations

121 patients of Shwetapradara Roga were registered. Out of which 101 patients completed the course of the treatment with follow up, whereas 20 patients left the treatment against medical advice, in this series -

- Most of the patients i.e. 53.72%were of 20-30 years of age group. 85.12% of patients were Hindus. Majority of the patient i.e. 97.52% were married. 33.88% of patients were educated upto H.S.C. 98.35% of patients were housewives.

Most of the patients i.e. 67.77% were having lower middle class.66.11% of patients were from urban area.

- 66.11% of patients were having moderate physical exertion. Most of the patients i.e. 64.46% were vegetarians and 33.88% were having poor appetite. 90.08% of patients were habituated to tea. 76.86% of patients were having regular bowel habit and 71.90% of patients were having regular / usual micturation habit.
- 34.71 of patients attained their menarche age at 14 years. 34.78% of patients had duration of menstrual period of 3 days. 91.30% of patients were having inter-menstrual period between 28 to 35 days. 84.35% of patients were having regular menstrual cycle. 68.69% of patients had no pain during menstruation. 77.39% of patients had moderate amount of menstrual blood loss. 38.84% of patients were not using any contraceptives. 80.99% of patients were multiparous.
- Majority of the patients i.e. 64.46% had Vata-Pitta Prakriti and 80.99% of patients had Rajasika Manasa Prakriti. 73.55% of patients were having Madhyama Sara, 69.42% of patients were having Madhyama Samhanana, 66.94% of patients were having Madhyama Pramana, 94.21% were having Mishra Rasa Satmya, 80.16% were having Madhyama Satva, 89.26% of patients were Yuvati and 95.87% of patients were from Jangala Pradesh. 67.77% were having Madhyama Yyayama Shakti, 66.11% of patients were having, Madhyama Abhyavaharana Shakti, 63.63% of patients were having Madhyama Jarana Shakti and 57.02% of patients were having Vishamagni.
- Majority of the patients i.e. 34.71% were having Annavaha Srotodushti Lakshanas like Aruchi and Avipaka. 49.59% of patients were having Shrama Lakshana of Rasavaha Srotodushti, 54.54% of patients were having Sandhivedana Lakshana of Mamsavaha Srotodushti and 34.71% of patients were having Asthishoola Lakshana of Asthivaha Srotodushti.
- Most of the patients i.e. 80.99% were having RVRF uterus, 98.35% of patients were having normal size uterus, 95.04% of patients were having mobile uterus, 56.20% were having hard cervical consistency, 100% of patients were normal cervical size, 76.86% of patients were having non tender cervix and 61.16% were having tenderness of fornicies.
- Gram -ve bacilli was found in 34.71% of patients by wet vaginal smear examination, 33.88% of patients were having pH of 5, 100% of patients were having normal vaginal cytology and 100% of patients were not having A.F.B. in vaginal discharge.
- 55.83% patients had dysfunctional vaginal discharge and 50.41% of patients were having cervical erosion. 97.52% patients had negative family history, 66.94% patients had taken modern medicine for this disease previously. 43.80% of patients were suffering from more than 12 months and 75.21% patients had gradual onset. 35.54% patients had Pandu Pichchhila Yonisrava, 50.41% patients had Yoni Pichchhilata and 75.21% patients had suffering from Katishoola.

Results

- Overall effect of therapy in Group A, complete remission was observed in 20 patients i.e. 58.82%. Markedly improvement and only improvement were found in equal numbers of patients i.e. 3 (8.82%). 8 patients i.e. 23.53% in Group A remain unchanged.
- Overall effect of therapy in Group B, complete remission was observed in 17 patients i.e. 50.00%. Markedly improvement was found in 2 patients i.e. 5.88%, only improvement was obtained in 5 patients i.e. 14.71% and 10 patients i.e. 29.41% in Group B remain unchanged.
- Overall effect of therapy in Group C, complete remission was observed in 9 patients i.e. 27.27%. Markedly improvement was not found in any patient, only improvement was obtained in 1 patient i.e. 3.03% and 23 patients i.e. 69.70% in Group B remain unchanged.

Discussion

Conceptual Study

Disease Review

- At that era, there in possibility that Shwetapradara was occurred as a symptom complex of various Yonivyapada, so details description on Shwetapradara is not available. And for this reason Shwetapradara is not mentioned as a specific disease due to its occurrence as a symptom complex.
- The word "Shwetapradara" was firstly mentioned by Acharya Vrinda Madhava on 9th century A.D. Later on Acharya Chakrapani had mentioned Kaphaja Asrigdara as Shwetapradara, but he had not described it in details.
- In modern medical science leucorrhoea is described as a separate disease. In the books of modern gynecology, details describes about etiology, pathology, signs and symptoms, investigation and management are available. In this present study a correlation of Shwetapradara and leucorrhoea is drawn.
- Among the causative factors of leucorrhoea, Trichomonas vaginitis is the commonest according to modern gynecology but in this study more cases of Bacterial vaginitis are found.
- Mostly E. coli is found in the wet vaginal smear of patients of the present study. Although E. coli is commonly found in stool. It may be spreaded to the vagina due to bad sanitary habit or contamination from stool. It may also be possible by cross infection from infected male partner.
- Leucorrhoea is solely a clinical finding. Though in the modern gynecology so many laboratory investigations are available for detecting of leucorrhoea like wet vaginal smear study for cytology, cervical scraping etc. But sometime no causative organism is found in cytology study due to improper sampling and drying of vaginal smear. So the laboratory investigations should not be counted as ultimate, these should be taken as the secondary measures to establish the clinical findings. So in this study although organisms are not detected in some patients yet they are included in the clinical trial on the basis of clinical finding of chief complaints.
- The management of leucorrhoea should be conducted according to the causative factors. Physiological leucorrhoea needs no treatment but only proper counseling. Vaginitis, malnutritional leucorrhoea need only oral medicine and avoidance of causative factors. Cervical erosion needs both oral treatment as well as local treatment like cauterization etc. In the Ayurvedic classics also there are two types of treatment schedules are given, one is oral medicine with avoidance of causative factors (Nidana

Parivarjana) and another is local application like Yoni Pichu, Yoni Prakshalana etc.

- The previous research works on Shwetapradara had been carried out by both the oral and local treatment. In this present study emphasis has been given to treat leucorrhoea by oral therapy and avoidances of causative factors (Nidana Parivarjana). According to modern gynecology local treatment like douche etc. is contraindicated in leucorrhoea to avoid iatrogenic infection from un-sterile instruments. In this present study no local therapy is taken in clinical trial. Because Yoni Pichu, Yoni Prakshalana etc. are done by mainly decoction (Kwatha) preparation, and it is very difficult to prepare sterile decoction. Sometimes the un-sterile instrument cause primary and later on the local treatment leads to persistent infection to the cervix and vagina leads to chronic leucorrhoea.

Drug Review

- **Pushyanuga Ghanavati:** This drug is mentioned in the Ayurvedic classics by the name of Pushyanuga Churna. It is also dispensed from the OPD & IPD of I.P.G.T. & R.A., Hospital in powder form. But it made difficulties to the patients to intake in such a large dose (3 to 6 g). In the present study the raw drugs (Course powder - Yavakuta) of Pushyanuga Churna were collected from Pharmacy of Gujarat Ayurved University, decoction was prepared, and again the decoction was concentrated by evaporations, Ghana was prepared and finally Pushyanuga Ghanavati in tablets form were made to convert the powder form in a palatable and convenient dosage form. It facilitates in dose fixation and easy intake.
- **Kukkutandatwak Bhasma:** Mainly medicines of Kashaya Rasa dominance are prescribed to the patients of Shwetapradara. Because Kashaya Rasa acts as Stambhana thus restrain the Srava. Kukkutandatwak Bhasma is a drug of Kashaya Rasa dominance, so it is chosen for the clinical trial. The Bhasma preparations are very effective and described in Rasashastra (branch of Ayurveda). These preparations are palatable, effective in less dose and act quickly. In this present study Kukkutandatwak Bhasma was prepared by using Hingula (cinnabar) as Maraka Dravyas (drug for incineration). Hingala is Yogavahi in nature. It may impart this quality to the Bhasma preparation. By the help of this quality the drug may enter easily into the Srotasa and mitigate the disease within a shorter duration.

Clinical Study

- Pushyanuga Ghanavati is found to be comparatively more effective on Yonitah Shwetasrava because of its Kashaya Rasa Pradhana properties. But, this difference is not apparent between the test drugs treated groups because both are having Kashaya Rasa and by virtue of its Gunas restrains Yonitah Shwetasrava.
- Comparatively Kukkutandatwak Bhasma treated groups showing better effect on Yonigat Lakshanas like Yoni Pichchhilata etc. This may be due to Yogavahi effect of this Bhasma. Means it acts quickly on these symptoms.
- Kukkutandatwak Bhasma delivered significant results on associated symptoms like Katishoola etc. So it may be inferred that Kukkutandatwak Bhasma due to its calcium content alter calcium deficiency state. Further Kukkutandatwak Bhasma is a Rasa preparation so, reach to rapidly affected Srotasa and cure Srotodushti.
- None of the test drugs are effective to treat cervical erosion. Cervical erosion is generally treated by Agnikarma, cauterization etc. local treatment. Suggest that only oral treatment can't be effective on cervical erosion.

Probable Mode of Action

Pushyanuga Ghanavati

- Cure of disease happens due to Samprapti Vighatana. This happening can be explained by the action of Rasa, Guna, Virya, Vipaka and Prabhava of drugs in the various Srotasa and on Dosha and Dushyas in human body.
- Pushyanuga Ghanavati was possess mainly Kashaya Rasa. This Rasa is formed by the conjugation of Prithvi and Vayu Mahabhuta. Prithvi by virtue of its Kathina Guna is opposite to Drava Guna and Sthira in quality and Vayu is Ruksha in quality. So, Kashaya Rasa by virtue of its Guna restrain Srava.
- Acharya Charaka has mentioned Kashaya Rasa as having pharmacological properties like Stambhana and Kaphanashaka. So, by this way also Kashaya Rasa stops Srava.
- The second dominant Rasa in Pushyanuga Ghanavati is Tikta Rasa, this is a combination of Vayu and Akasha Mahabhuta. This two Mahabhutas are having qualities opposite to Kapha, thus, alleviates Srava and Akasha Mahabhuta helps in opening of closed Srotasa. Tikta Rasa itself is Ruchivardhaka thus, increase appetite leads to mitigate malnutrition. It also excites Samana Vayu which leads to stimulation of Jatharagni causing alleviation the condition of Ama.
- The third dominant Rasa is Katu Rasa in Pushyanuga Ghanavati. This Rasa is formed by Vayu and Agni Mahabhuta, having qualities opposite to Kapha, thus, lessen Srava. And digests Ama by stimulating Jatharagni due to enhancement of Agni.
- Some of the ingredients possess Madhura Rasa. Madhura Rasa causes nourishment (Brimhana) of Dhatus thus, eradicates the ill effect of malnutrition.
- Most of the ingredients of Pushyanuga Ghanavati possess Laghu and Ruksha. By the virtue of this property this may pacify vitiated Kapha and Kleda. Snigdha Guna is predominant in some ingredients. So, this ingredients alleviate vitiated Vayu, thus leads to stop secretion.
- Most of the ingredients of Pushyanuga Ghanavati are having Katu Vipaka. By virtue of this quality this may alleviate the vitiated Kapha and eradicate Shwetapradara.
- Almost ingredients possess Sheeta Virya and rest of the ingredients possess Ushna Virya. Sheeta Virya drugs alleviates the condition of vitiated Pitta. And the Ushna Virya drugs pacify vitiated Vata and Kapha, this also stimulate Jatharagni thus help in digestion of Ama. So ultimately the drug Pushyanuga Ghanavati act as a Tridoshanashaka drug.
- The Tridosha Prashamana effect of this drug can also be interpreted by the Doshaghna effect of the ingredients. Some are Kapha-Pittanashaka, Vata-Kaphanashaka some are and rest are Tridoshanashaka.
- The symptomatic relief of Shwetapradara by Pushyanuga Ghanavati can be explained by pharmacological action of the ingredients. Most of ingredients are having Kashaya,

Tikta and Katu Rasa, so having properties of Deepana and Pachana. And help in digestion of Ama, because Ama is the prime causative factor for Shwetapradara. Inflammatory condition may be lessen due to Shothaghna action, Vedana may be pacify the Vedana Sthapana and Dahaprashamana properties, general debility may be improve due to Balya, Brimhana and Rasayana effect and the local causative organism may be destroy by Krimighna property of the ingredients.

Kukkutandatwak Bhasma

- Kashaya Rasa is predominant in Kukkutandatwak Bhasma. It dries of Kleda by virtue of Sangrahi, Soshana, Stambhana and Shleshma Prashamana properties of Kashaya Rasa. [14] Kashaya Rasa is mainly formed by conjugation of Vayu and Prithvi Mahabhuta. Both have opposite qualities of Drava Guna. So, this help in cessation of Srava.
- Kukkutandatwak Bhasma is chiefly having Ruksha Guna. Ruksha Guna by virtue of its Shoshana action restrain Srava.
- Kukkutandatwak Bhasma is having Sheeta Virya. A drug by virtue of its Virya mainly acts in Srotasa. Sheeta Virya drugs acts in Srotasa and causes Stambhana. By this way trial drug restrain Srava by Stambhana action in Srotasa.
- The drug possess Katu Vipaka, so it acts the same way of Pushyanuga Ghanavati, which is described earlier.
- This Bhasma is a Rasa preparation, so may act quickly and enter into the Srotasa by Tikshna Guna. It was prepared by using Hingula as drug of incineration (Maraka Dravya). Hingula possess Yogavahi Guna.
- During Bhasma preparation it may impart the Yogavahi Guna to the Bhasma. So, the Bhasma may act quickly and in smaller dose.

Conclusion

- Acharya Vrinda Madhava had firstly quoted the word "Shweta Pradara".
- Kukkutandatwak Bhasma and Pushyanuga Ghanavati had shown statistically highly significant result on Yonitah Shwetasrava, but placebo had shown insignificant result. In this respect both the test drugs, Kukkutandatwak Bhasma and Pushyanuga Ghanavati were equiactive.
- Also statistically highly significant results were observed on Yonigat Lakshanas in groups treated with test drugs, but comparatively Kukkutandatwak Bhasma displayed better result.
- Kukkutandatwak Bhasma had shown statistically highly significant results on associated symptoms, whereas Pushyanuga Ghanavati and placebo had shown significant results on associated symptoms. It reveals that Kukkutandatwak Bhasma is more effective on associated symptoms
- There was statistically significant result on local pathology in Kukkutandatwak Bhasma and Pushyanuga Ghanavati treated patients. But insignificant result was observed in placebo treated patients.
- Overall effect of therapy reveals more effectiveness of Kukkutandatwak Bhasma than Pushyanuga Ghanavati and these can be successfully employed in treating the patients of Shwetapradara.

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