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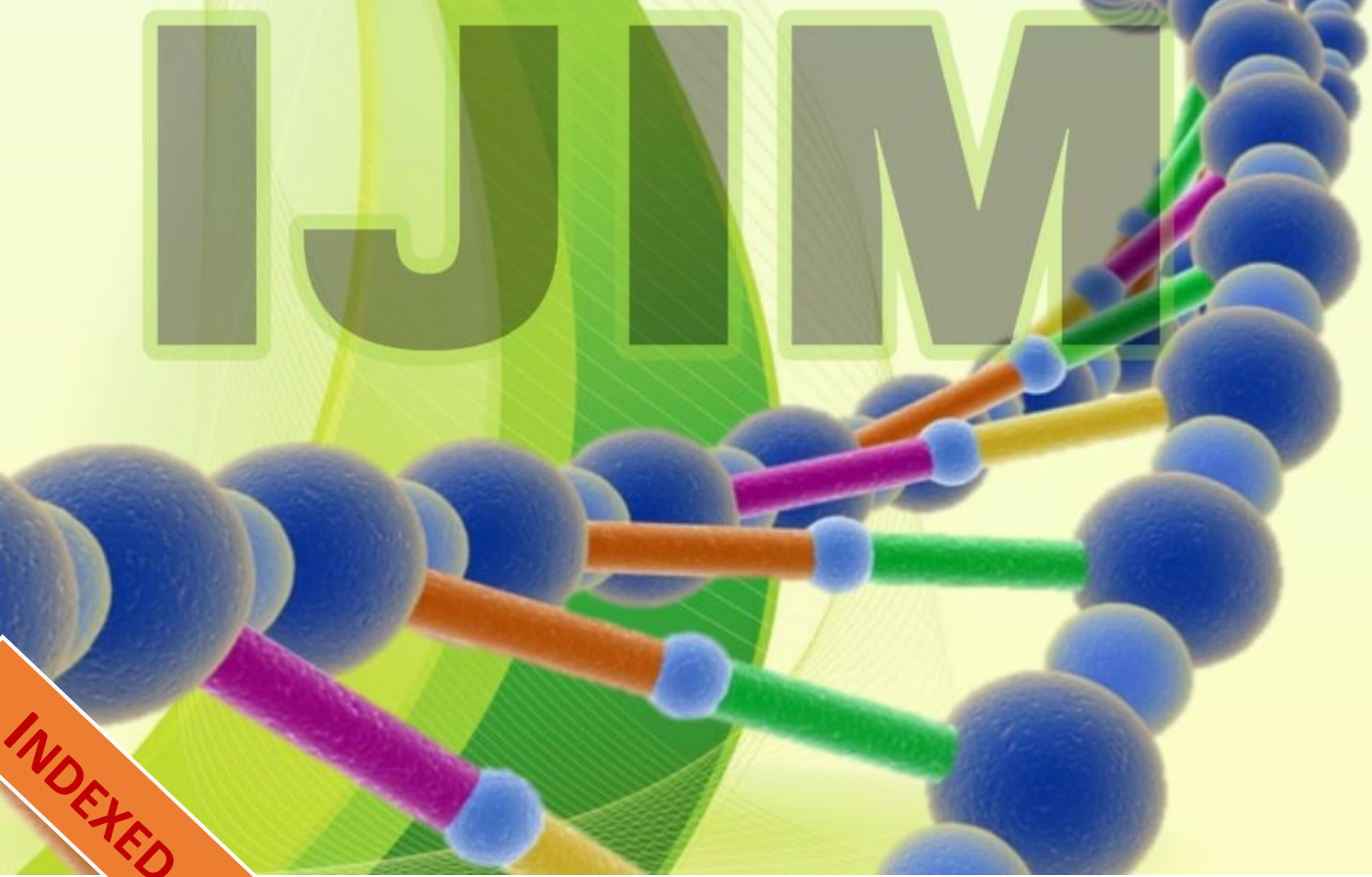

Case Study

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Ayurvedic Management of Pelvic Inflammatory Disease Associated with Microbial Infection: A Case Series

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ABSTRACT:

Introduction: Pelvic inflammatory disease (PID) is a polymicrobial disorders and having various clinical entity. Available parenteral and oral regimens for PID are urgent need of the patient, but the resistance to various antibiotics is a health challenge. Ayurvedic treatment must establish to challenge this research problem. Hence, research problem was critically viewed and treatment protocol for befitting the *breaking pathology* of PID was planned. **Clinical findings**: Four cases with the complain of abnormal vaginal discharge, pelvic pain and trans cervical motion tenderness were present. **Diagnosis:** Bimanual pelvic examination was done before and after treatment. Escherichia coli, pseudomonas aeruginosa, and candida albicans was present in vaginal wet smear which is the main diagnostic tool in this study. **Interventions:** *Punarnavadi Guggulu* orally (500 mg TDS) and *Panchavalkaladi Taila Yonipichu* (10 ml once a night) was given to patient for eight weeks. **Outcome:** Patients presented with absence of clinical symptoms and microbial infection after completion of treatment course. **Conclusion:** Ayurvedic formulations *Punarnavadi guggulu* orally and *Panchavalkaladi Taila Yonipichu* are found to be effective treatment modalities in polymicrobial infection induced pelvic inflammatory diseases.

KEYWORDS: Candida albicans, Escherichia coli, Panchavalkaladi taila, Pseudomonas aeruginosa, Punarnavadi guggulu

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INTRODUCTION:

Pelvic inflammatory disease (PID) is a clinical condition among reproductive women which creates infection, and inflammation of the uterine lining (endometritis) and fallopian tubes (salpingitis) that often results in chronic pelvic pain, tubal factor infertility, and recurrent PID.[1] PID has been found in 30-40% of cases where the aetiology is an ascending infection of the lower genital tract by polymicrobial.[2] Tubal factors infertility usually linked with history of PID.[3] Microbiological heterogeneity in PID is one of the main concerns for providing efficient treatment. The growing multidrug resistance of microorganism and also other side absence of an antibiotic regimen against these microorganism are such a challenge for almost every healthcare system in terms of safety and effectiveness.[4] Sexually active women having pelvic pain accompanied by abnormal vaginal discharge, intermenstrual or postcoital bleeding, lower back pain, dysuria and weakness warrant a strong suspicion for PID.[5] Cervical motion tenderness, Uterine tenderness and adnexal tenderness are the minimum criteria to consider PID on pelvic exams.[5] White blood cell count, Erythrocyte Sedimentation Rate (ESR), and C-reactive protein (CRP-quantitative) may aid in the confirmation of diagnosis, although alterations of these parameter are also nonspecific.[6] No single infection causes PID and no signs and symptoms are pathognomonic for PID.

PID causing microorganisms may be divided into three broad groups i.e., sexually transmitted diseases, respiratory pathogens, and endogenous vaginal/bowel microbes.[7] First step for developing PID is started after ascending infection in the endometrium with Gram-negative *Escherichia coli* (E. coli) in cattle, further it may precede infection by other bacteria also. [8,9,10] The presence of *E. coli* is associated with the acute phase protein response boosting the severity of PID and finally its extents infertility.[8,9] Aerobic and anaerobic bacteria constitute the normal vaginal flora that may also become frequent secondary invaders. These bacteria can cause an initially sexually transmitted infection following PID.[11]

Recommended antibiotic regimens are empirical and broad-spectrum. Hence, European, Clinical Diagnostic Criteria, and World Health Organisation guidelines recommend different antibiotic regimens in response to their epidemiological data. [5,12,13]

It is high time to save the lives of diseased humans from an antibiotic. Ayurveda has the opportunity to save lives in this antibiotic era. Clinical features of *Paripluta Yonivyapad* show the most convergence with PID.

It is characterized by *Gramyadharmaruja* (~dyspareunia), *Shotha* (~inflammation), *Sparshaakshamatwa* (~pelvic tenderness), painful menstruation & *Vedana* in *Shroni*, *Vankhshana*, and *Prustha*. (~pain in pelvic, groin, and lower back).[14,15] Aggravated *Pitta* associated with *Vata* reaches *Yoni* and causes *Shotha* (~inflammation) in *Yoni* (~reproductive tract) those similar manifestations are seen in PID.

Patient Information

Case Reports

Case 1

A 28-year-old married housewife visited Prasutitantra Evum Streeroga (PTSR) Outpatient Department with chief complaints of abnormal white discharge, pelvic pain, and painful coitus. Her husband had no local scrotal infection and sexually transmitted diseases. She had also undergone hysterosalpingography before 2 years and reports a present bilateral cornual block. As the patient was anxious because of their unsatisfactory sexual life and she took allopathy medical treatment for the same problem but did not get relief, so she opted

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Ayurveda for further treatment. On per vaginal examination, Trans-cervical motion and adnexal tenderness were found present. Heavy growth of E. coli was found in Vaginal Wet mount culture. USG reports were revealed normal. Her oral temperature was 98.4°F. Her CRP was within normal limits. Her ESR was noted high 40 mm/hr.

Case 2

A 32-year-old married female came with complaints of painful coitus, excessive and irregular menstrual flow, pelvic pain and cheese-white vaginal discharge. She was having 7 years of a male child and 3 years of a female child through caesarean section. She had undergone tubal ligation before 2 years. Her husband had no sexually transmitted diseases. Trans-cervical motion and adnexal tenderness were present in the bimanual pelvic examination. Pseudomonas aeruginosa was found present in her vaginal aerobic culture. USG was advised to her for to exclude any pelvic pathology. Free fluid in the pouch of Douglas and a prominent pelvic vein was noted in her USG. Her oral temperature was 99°F. Her CRP and ESR were within normal limits.

Case 3

A 31-year-old married female has complaints of only infertility. She had noted painful coitus sometimes. She had also mild yellowish discharge. However, there was some variation in her USG report as there was a 2.8*2.8*3.5 cm chocolate cyst in the right ovary and terminal hydrosalpinx in the left adnexa with a prominent pelvic vein. On bimanual examination, trans-cervical motion and adnexal tenderness were found present. Escherichia coli was present in her vaginal aerobic culture and candida Albicans was present in her vaginal fungal culture. Her oral temperature was 99°F. Her CRP and ESR were within normal limits. Her husband had no sexually transmitted diseases.

Case 4

A 29-year married female reported yellowish vaginal discharge and painful coitus. Her husband had itching in the scrotal region. He was treated by a modern consultant. Trans-cervical motion and adnexal tenderness were present in the bimanual pelvic examination. Escherichia coli was present in her vaginal aerobic culture. Her USG reported free fluid in the pouch of Douglas and moderate vascularity in the bilateral parametrial region. Her oral temperature was 98.4° F. Her CRP was high 40 mg/L and her ESR was within normal limits.

***Dashavidha pareeksha* (~ tenfold examination)**

The *Shareera prakriti* (~nature of body) of all patients were *Vatapittaja*. *Vikriti* (~morbitdity) were Tridosha (three Doshas of body) along with *Rakta*. *Satwa* (~psyche), *Sara* (~excellence of tissues), *Samhanana* (~compactness), *Ahara shakti* (~power of intake and digestion of food), *Vyayama Shakti* (~power of performing exercise), *Satmya* (~habituation), and *Pramana* (~anthropometry) of the patient were of *Madhyama* (~moderate) level.

Timeline

Timeline of cases are depicted in table 1.

Table 1. Timeline of the cases

Case no	Day	Aerobic & fungal culture	Vaginal pH	Treatment
1	Day 1	Test was done	7	-
	Day 2	E.coli present	7	*Punarnavadi guggulu* orally, *Panchavalkaladi taila yonipichu*

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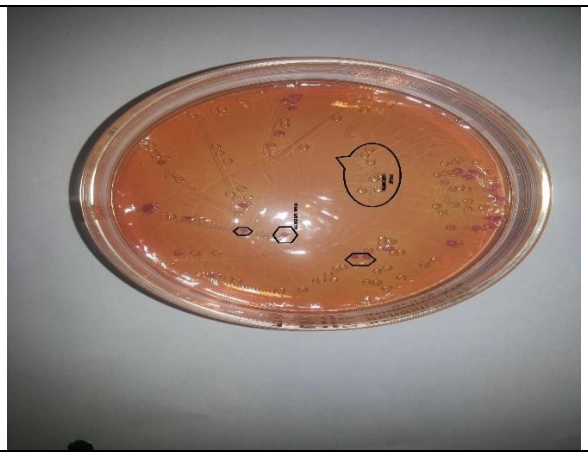
	Day 30	Repeat culture test: presents E.coli	7	*Punarnavadi guggulu* orally, *Panchavalkaladi taila yonipichu*
	Day 45	Repeat culture test: absent organism	4	-
2	Day 1	Test was done	9	-
	Day 2	Pseudomonas aeruginosa present	9	*Punarnavadi guggulu* orally, *Panchavalkaladi taila yonipichu*
	Day 30	Pseudomonas aeruginosa present	7	*Punarnavadi guggulu* orally, *Panchavalkaladi taila yonipichu*
	Day 60	Repeat culture test: absent organism	5	-
3	Day 1	Test was done	7	-
	Day 2	E.coli and Candida albicans present	7	*Punarnavadi guggulu* orally, *Panchavalkaladi taila yonipichu*
	Day 30	Repeat culture test: absent Candida albicans but E.coli was present	5	*Punarnavadi guggulu* orally, *Panchavalkaladi taila yonipichu*
	Day 60	Repeat culture test: absent E.coli	5	
4	Day 1	Test was done	9	
	Day 2	E.coli present	9	*Punarnavadi guggulu* orally, *Panchavalkaladi taila yonipichu*
	Day 30	Repeat culture: present E.coli	7	*Punarnavadi guggulu* orally, *Panchavalkaladi taila yonipichu*
	Day 60	Repeat culture: absent E.coli	5	-

Diagnostic Assessment

Digital examination, vaginal pH and Wet smear culture was carried out periodically. [Figure 1]

Escheria coli



Pseudomonas aeruginosa

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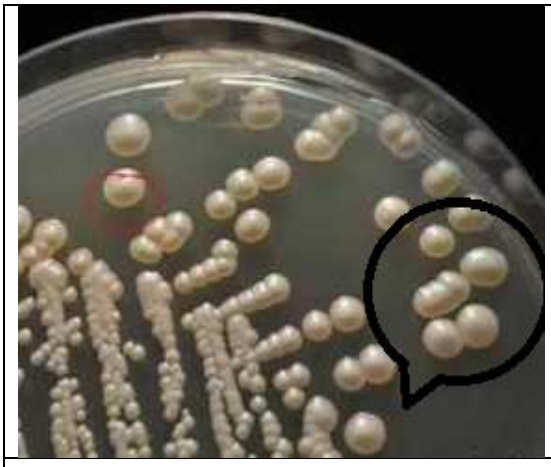

Candida albicans

Figure 1. Prescence of different microbial growth

Therapeutic Interventions

Punarnavadi Guggulu[16] and *Panchavalkaladi Taila*[17] *Yonipichu* (~vaginal tampon) were prescribed for all four cases. *Punarnavadi Guggulu* (each of 500 mg) two tablets were prescribed to take orally before a meal at the interval of 8 hours with the *Anupana* of warm water for 8 weeks to 4 patients. *Panchavalkaladi Taila* (10 ml) was advised locally for *Yonipichu* at bedtime for 10 days (after cessation of menstruation). Under all aseptic precautions, the sterile tampon was soaked in 10 ml medicated lukewarm *Taila,* and was advised to insert with the index finger into the vaginal canal in such a way that the thread of the *Pichu* should come out of the vagina. Patients were instructed to retain the *Pichu* for 3 hours or till the urge to micturition. [Table 2]

Table 2. Details of the ayurvedic drugs in the case series

Drug	Dose	Route
Punarnavadi guggulu	2 tablet TDs (each of 500 mg) with warm water before meal	Oral
Panchavalkaladi Taila	10 ml once at night in *Pichu* form till urge of micturition	Intra Vaginal as vaginal tampon (Stop during mestruation)

Follow-Up And Outcome

The patient was followed up on the 30th day and the 60th day during treatment. Pelvic pain and abnormal vaginal discharge were found absent in all cases within 30 days of treatment. In case 2, vaginal discharge was found normal from cheese discharge after 45 days of treatment. E.coli, Pseudomonas aeruginosa, and candida albicans was found absent in the vaginal Wet smear culture test after 60 days of treatment. Trans cervical motion tenderness and adnexal tenderness were found absent within 30 days in all cases. Pain during coitus was found absent within 30 days in all cases. In case 1, ESR was 12 mm/hr after 60 days of treatment. In case 4, CRP was 3 after 60 days of treatment. During her course, all patients never reported any adverse effects of the medication.

DISCUSSION:

Onset of pelvic pain, dyspareunia and abnormal vaginal discharge may fail to seek treat within three days, can result in a threefold increase in the risk of PID and also infertility. [18] Thus, early diagnosis is must to avoid critical conditions.

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Painful coitus and trans-cervical motion tenderness suggests presence of peritoneal inflammation. *Artavavaha Srotas* (~ reproductive tract) can be understood as blood vessels-capillaries and fallopian tube. [19] *Aama* (~undigested food) is accumulated in *Artavavaha Srotas* and creates *Srotorodha* (~obstruction in channels) which causes inflammation, is a reason for tenderness. All the diseases of *Yoni* (~ female genital organs) cannot occur without the involvement of *Vayu*.[20] *Apana Vayu* (~ a type of *Vayu*) is located in pelvic region. Reverse direction of *Apana Vayu* is caused by *Vatakopa* (~ vitiation of *Vayu*) due to *Vegadharana* (~ suppresses urge) or *Srotorodha* which causes pelvic pain, lower backache and sometimes abdominal pain. Aggravated *Vayu* [by its *Chala(*~instability) and *Vishada Guna* (~ conspicuousness qualities)] with *Pitta* [by its *Visra* (~ foul smell), *Sara* (~ instability), and *Drava Guna* (~fluidity)] is responsible for the mucopurulent discharge. Hence *Vata-Pittahara* (~ relieves *Vata* and *Pitta*) medicines are required. *Dushyas* are *Rasa* (~ primary product of digested food) and *Rakta* (~ blood tissue). Hence the medications should possess *Rasapachaka* (~ digestion of food) and *Raktashodhaka* (~blood purifier) properties. *Srotodushti* (~ deformity in body channels) is type of *Sanga* (~ obstruction due to contraction of lumen) and *Atipravriti* (~ increase flow of the contents in the body channels). So, this problem can be controlled by *Amapachana* (~digestion of toxin) and *Vatanulomana* (~normal movement of *Vayu*) drugs. With this line of treatment, *Vata-Pittahara* (which alleviates vitiated *Vata* and *Pitta Doshas*), *Rasapachaka, Raktashodhaka, Shothahara*, *Vedanasthapana* (~analgesics), *Vranashodhana* (~purification of wound) and *Vranaropana* (~ healing of wound) medicine i.e., *Punarnavadi Guggulu* orally and *Panchavalkaladi Taila Yonipichu* were chosen for this case series. *Panchavalkaladi* drugs are described to use as *Taila Kalpana* to deliver through *Yoni Pichu* because *Taila* is directly indicated as *Yonishodhaka* (~ purification of reproductive tract) [21] also causes *Snehana* (~unctuousness), *Vishyandana* (~fluidity), *Mardavata* (~Softness), *Kledana* (~moistness) and maintain the vaginal pH as well.

Punarnavadi Guggulu is a classical ayurvedic formulation, used as anti-inflammatory. Aqueous extract (~decoction) of *Boerhaavia diffusa* was found active against seven bacteria including Escherichia coli, Salmonella typhi, Salmonella typhimurium, Klebsiella pneumoniae, Enterobacter aerogenes, Pseudomonas aeruginosa and Enterococcus faecalis.[22] *Devdaru* (~*Cedrus deodara* Roxb. Loud.) [23,24,25] *Haritaki* (~*Terminalia chebula* Retz) [26,27] *Guduchi* (~*Tinospora cordifolia* Willd.) [28], *Gomutra* (~cow's urine) [29] and *Guggulu* (~*Commiphora mukul* Engl) [30] possess anti-inflammatory, analgesics and anti-microbial activity. *Punaranva, Haritaki, Devdaru* and *Guduchi* are mixed with *Guggulu* and *Gomutra* to breakdown *Srotorodha* and eliminate microbial contamination. The detoxifying process of reproductive tract supports the proper function of the pelvic peritoneum and also digestive systems which further aiding in the prevention of further recurrences of PID.

Panchavalkaladi Taila are having *Kashaya* and *Tikta*, *Vata-Pittahara*, *Shothahara* (anti-inflammatory) and *Vrana-Shodhana* properties. [31] *Panchavalkaladi Taila* is introduced through vagina which gets absorb through vaginal epithelium as sub-epithelium layer is vascular and rich up to internal circulatory system and reduced inflammatory reaction. The chemical constituents and mechanism of action of drugs possess activities like anti-inflammatory, anti-bacterial and anti-fungal.[32] *Panchavalkala* local therapies are predominantly beneficial in bacterial vaginitis and fungal infections.[33]

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CONCLUSION:

This case series demonstrate absence of microorganism and clinical improvement in PID with ayurvedic management. *Punarnavadi Guggulu* and *Panchavalkaladi Taila* was found to be very effective in Escherichia coli, Pseudomonas aeruginosa and Candida albicans induced pelvic inflammatory diseases in this case series. Large sample clinical study will only establish the hypothesis and may help to contribute to avoid recurrence of specific microorhanism and sexually transmitted diseases in initial stages.

Declaration of patient consent

The authors certify that they have obtained patient consent from here the patients have given her consent for reporting the case and other clinical information in the journal. The patient understands that her name and initials will not be published and due efforts will be made to conceal her identity, but anonymity cannot be guaranteed**.**

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