

Efficay Of Kutaj Vati In Garbhini Mutrakricchra (Uti In Pregnancy)

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Abstract

Garbhini Mutrakricchra, correlating clinically with urinary tract infections in pregnancy, arises from Vata-Pitta imbalance affecting the Mutravaha Srotas, compounded by physiological changes of gestation such as urinary stasis and hormonal influences. In a study predominantly involving women aged 26–30 years, mostly multiparas in their third trimester, the majority (91%) presented with painful, burning, and frequent urination, confirming the clinical burden of this condition. Kutaj Vati administered with Godugdha over five days showed remarkable therapeutic outcomes, with a significant reduction in painful micturition (66.67%), burning sensation (80.64%), and urinary frequency (77.5%), attributable to its Pitta-shamaka, Shothahara, and Vata-balancing actions. Objective markers supported these improvements, with a 15.96% reduction in TLC, 7.09% decrease in neutrophil count, and a substantial 63.73% decline in urine pus cells, highlighting Kutaj Vati's antimicrobial, anti-inflammatory, and immunomodulatory effects.

The clinical study establishes Kutaj Vati as a safe, effective, and well-tolerated Ayurvedic intervention for Garbhini Mutrakricchra (urinary tract infections in pregnancy). It significantly reduces key symptoms such as pain, burning micturition, and urinary frequency, while objective improvements in leucocyte and pus cell counts confirm its infection-resolving potential. In the context of rising antibiotic resistance and the risks of teratogenicity with conventional agents, Kutaj Vati emerges as a viable alternative or adjunct in prenatal care. By integrating symptom relief with dosha balancing, antimicrobial, and anti-inflammatory actions, it highlights the translational value of Ayurvedic formulations in obstetric research and practice, positioning it as a promising supportive therapy in pregnancy-associated urinary tract disorders.

Keywords: Garbhini mutrakricchra, urinary tract infection, pregnancy, kutaj vati, godugdha, urine pus cells, burning micturition

INTRODUCTION

Pregnancy induces profound physical, mental, and emotional changes in women, necessitating comprehensive clinical care to safeguard maternal and fetal health. Physiological adaptations such as hormonal fluctuations, increased blood volume, mechanical pressure from the enlarging uterus, and immune modulation contribute to heightened susceptibility to certain conditions, including urinary tract infections (UTIs). Clinically, UTIs in pregnancy manifest as dysuria, frequency, urgency, and suprapubic discomfort—symptoms that overlap with the Ayurvedic description of *Mutrakricchra*, defined as painful and difficult micturition.

Classical texts describe urinary disorders (*Mutraroga*) as arising from imbalances in Dosha and Dushya, with *Mutravaha Srotodushti* identified as the pathogenic basis. Acharyas Charaka and Sushruta associated painful and disturbed urination with *Mutrakricchra Vyadhi*, a condition conceptually aligned with pregnancy-related UTIs in contemporary medicine.

Modern biomedical perspectives attribute pregnancy-associated UTIs to progesterone-induced smooth muscle relaxation, urinary stasis, vesicoureteral reflux, short urethral anatomy, and hygiene challenges in late gestation. Given the global challenge of antibiotic resistance, especially critical in low-resource settings, and the potential risks associated with antibiotic use in pregnancy, the exploration of Ayurvedic herbal formulations and plant-based antimicrobials emerges as a promising complementary strategy.

The yoga kutaj vati chosen from the classics (*yogratnakar Samhita*) its administration with Godugdha as anupan over five days demonstrated substantial clinical efficacy in amelioration of urinary symptoms. Painful micturition showed a statistically significant reduction of 66.67%, indicating the potent analgesic and anti-inflammatory properties of Kutaj Vati in mitigating urinary tract irritation mediated by Vata and Pitta doshas. Burning sensation during urination, a predominant distressing symptom related mainly to Pitta aggravation, improved remarkably with an 80.64% reduction. These findings reflect Kutaj's classical

attributes of Pitta-shamaka (cooling), Shothahara (anti-inflammatory), and Kandughna (anti-pruritic) actions, facilitating mucosal healing and symptom relief.

One of the key findings of the study was the excellent safety profile of Kutaj Vati. No adverse effects were reported during the study, making it highly suitable for use in pregnant women, where pharmacotherapy options are limited due to potential teratogenicity and fetal risks associated with many conventional antibiotics. Usage with Godugdha (cow's milk) as anupan likely enhanced palatability and absorption while aligning with Ayurvedic principles.

MATERIALS AND METHODOLOGY:

Study Design:

- **Type:** Open-label clinical trial
- **Objective:** To evaluate the efficacy of Kutaj vati in Garbhini mutrakricchra(UTI)
- **Sample Size:** 33

Study Site:

- Conducted at the OPD, Department of Prasuti Tantra Evam Stree Rog, Bharati Vidyapeeth Deemed University College of Ayurveda, Pune

Materials:

- **Drug:** *Kutaj vati*
- **Contents:** *Kutaj bark*

Methodology:

Dose and Administration:

- Dose: 500mg BD
- Timing: after breakfast and dinner.
- Duration: 5 days.
- Anupan: Godugdha

SELECTION CRITERIA:

Inclusion Criteria

1. Antenatal subjects complaining of painful micturition, burning micturition, increased frequency of micturition.
2. Mild burning micturition from 2-7 days.
3. Both primi and multi gravida of age group 18-35 years.
4. Subjects presenting with gestational age of all three trimesters.

Exclusion Criteria

1. Known case of systemic disorders like Diabetes, Hypertension etc.
2. Subjects presenting UTI with fever
3. Subjects taking medicines for any other systemic illness.
4. Immunocompromised Subjects.

ASSESSMENT CRITERIA:

Subject will be assessed for signs and symptoms using score card method and scoring will be done before and after treatment.

Subjective criteria:

1. Pain during micturition (saruja mutrata)
2. Burning micturition (sadaha mutrata)
3. Frequency of micturition (muhurmuhur mutrapravrutti)

PARAMETER	GRADE 0	GRADE 1	GRADE 2	GRADE 3
Pain during micturition (saruja mutrata)	No pain	Occasional bearable pain	Moderate pain	Severe pain
Burning micturition (sadaha mutrata)	Absent	Occasional mild burning	Moderate troublesome burning	Severe burning

Frequency of micturition (muhurmuhur mutrapravruti)	5-7 times/day	8-10 times/day	11-13 times/day	More than 13 times/day
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Objective criteria:

LAB Investigations

1. Urine (routine & microscopic)
2. CBC(TLC & Neutrophils)

No.	Investigations	Before treatment	After treatment
1.	Urine (routine & microscopic) Proteins-absent Sugar-absent Pus cells [0/hpf-2/hpf] Epithelial cells [3/hpf-5/hpf] RBC-absent	✓	✓
2.	CBC (TLC & Neutrophils) (TLC-[5,000/cumm-11,000/cumm] Neutrophils-[40%-75%])	✓	✓

STATISTICAL ANALYSIS

Data - before and after treatment of garbhini mutrakricchra will be analysed statistically.

OUTCOME MEASURES:

- Primary outcome: Improvement in signs and symptoms of mutrakricchra and improvement in lab investigations
- Secondary outcome: Improvement in comfort during micturition

OBSERVATION AND RESULTS

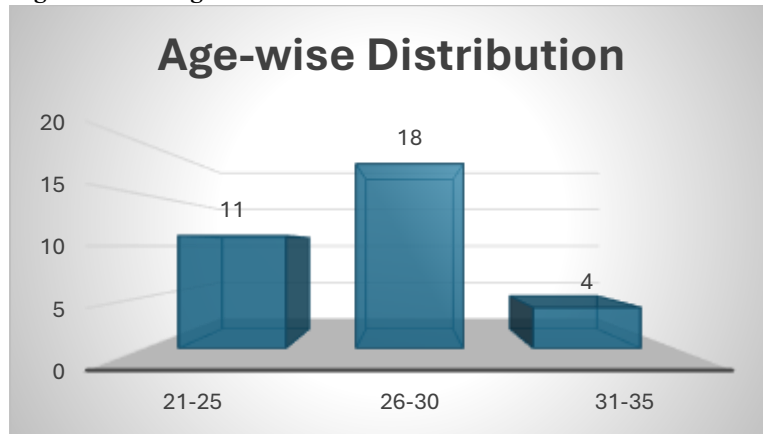
- Age wise distribution
- Parity wise distribution
- Trimester wise distribution
- Symptomatic/asymptomatic wise distribution
- Painful micturition wise distribution
- Burning micturition wise distribution
- Frequency of micturition wise distribution
- Pus cells wise distribution
- Total leucocyte counts wise distribution
- Neutrophils wise distribution

1) **Age-wise Distribution:**

Table no. 1: Age wise distribution

Age (in years)	No of patients	Percentage
21-25	11	33.3
26-30	18	54.5
31-35	4	12.1
Total	33	100

Figure no. 1: Age wise distribution



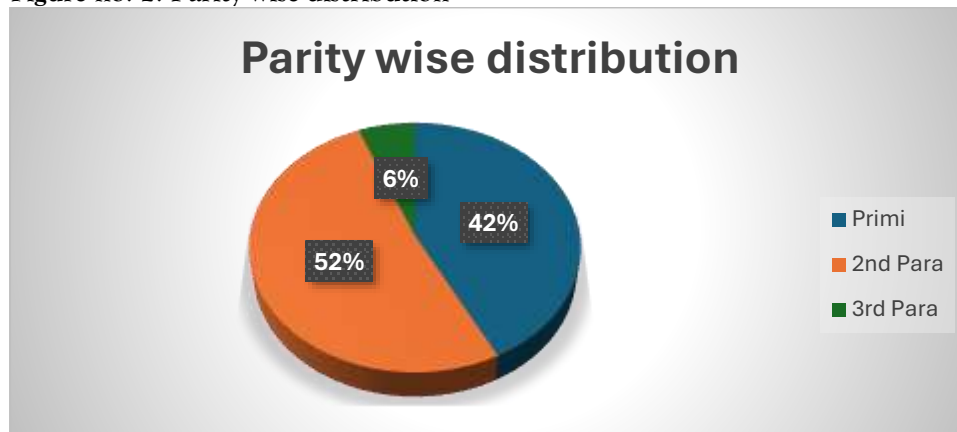
Interpretation: Above table no.1 and figure no.1 reveals that, maximum patients (54.5%) from age group 26-30 years, followed by 33.3% patients from 21-25 years and only 12.1% patients with age group 31-35 years.

2) Parity-wise Distribution:

Table no. 2: Parity wise distribution

Parity	No of patients	Percentage
Primi	14	42
2 nd para	17	52
3 rd para	2	6.1
Total	33	100

Figure no. 2: Parity wise distribution



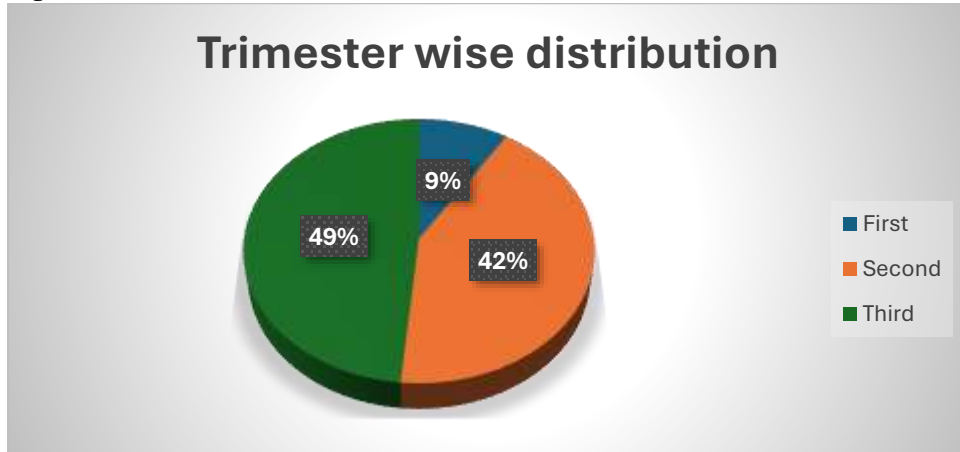
Interpretation: Above table no.2 and figure no.2 reveals that, maximum patients (52%) were in 2nd para, followed by 42% patients primi and 6% patients in 3rd para.

3) Trimester-wise Distribution:

Table no. 3: Trimester wise distribution

Trimester	No of patients	Percentage
First	3	9
Second	14	42
Third	16	49
Total	33	100

Figure no. 3: Trimester wise distribution



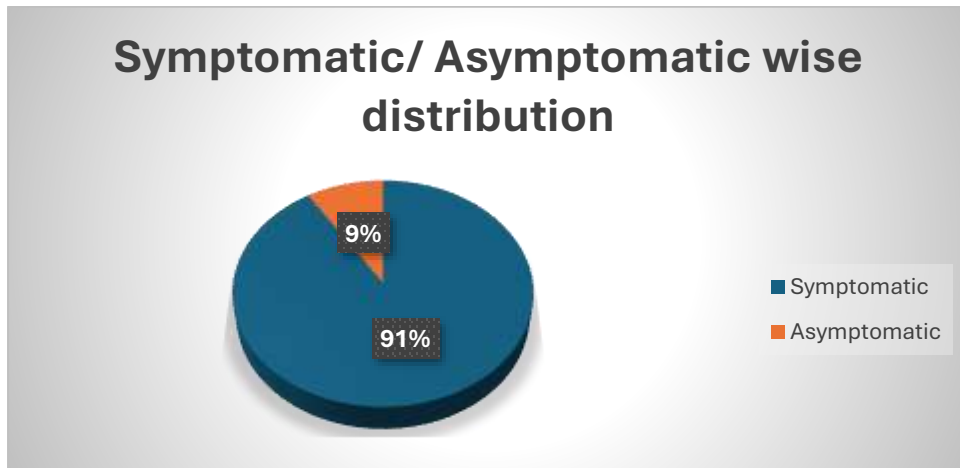
Interpretation: Above table no.3 and figure no.3 reveal that, maximum patients (49%) were in Third semester, followed by 42% patients in Second and 9% patients in first trimester.

4) Symptomatic/ Asymptomatic:

Table no. 4: Symptomatic/ Asymptomatic wise distribution

Symptomatic/ Asymptomatic	No of patients	Percentage
Symptomatic	30	91
Asymptomatic	3	9
Total	33	100

Figure no. 4: Symptomatic/ Asymptomatic wise distribution



Interpretation: Above table no.4 and figure no.4 reveals that, maximum patients (91%) were symptomatic while only 9% patients were not symptomatic

5) Painful micturition

Observation:

Before treatment, the average grade for Painful Micturition was 0.55. After treatment, it decreased to 0.18, showing a mean improvement in score of 66.67%. This improvement is significant based on the "Wilcoxon signed rank test" (as the p value is less than 0.05), indicating that there is a significant improvement in Painful Micturition for Garbhini mutrackricchra i.e., Kutaj vati was found to be effective for treating painful urination in cases of Garbhini mutrackricchra.

Statistical Analysis

Effect Of Kutaj Vati on Painful Micturition in Garbhini mutrackricchra

Figure no. 6.- Effect on Painful micturition

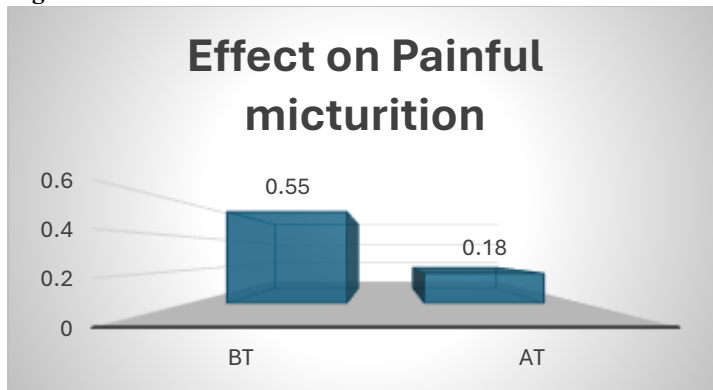


Table no. 6.- Statistical analysis of Painful micturition

Parameter	Mean		X	% of improvement	Negative rank	Positive rank	Tie	W	P VALUE
	BT	AT							
Painful micturition	0.55	0.18	0.37	66.67%	11	0	22	-3.207	0.001

6) Burning micturition

Observation- Before treatment, the average Burning micturition grade was 0.93, but it decreased to 0.18 after treatment. The score improved by an average of 80.64%, which is considered significant based on the "Wilcoxon signed rank test" results (with a p value of <0.05).

Therefore, it can be concluded that there was a significant improvement in Burning micturition related to Garbhini mutrackricchra i.e., Kutaj vati was found to be effective for treating burning urination in cases of Garbhini mutrackricchra

Statistical Analysis

Effect Of Kutaj Vati on Burning Micturition in Garbhini mutrackricchra

Figure no. 8.- Effect on Burning micturition

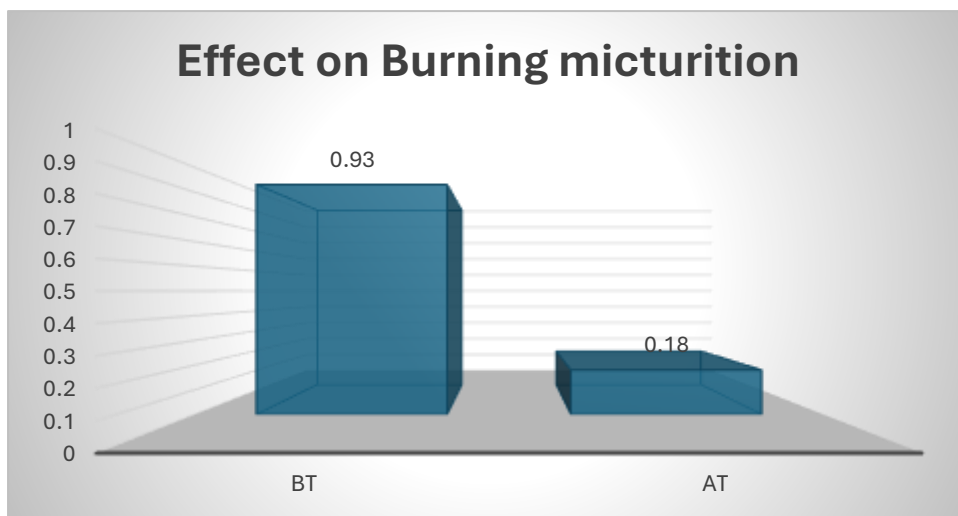


Table no. 9.- Statistical analysis of Burning micturition

Parameter	Mean		x	% of improvement	Negative rank	Positive rank	Tie	W	P VALUE
	BT	AT							
Burning micturition	0.93	0.18	0.555	80.64%	11	0	22	-3.207	0.001

Burning micturition	0.93	0.18	0.75	80.64%	17	0	16	-3.729	<0.001
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7) **Frequency of micturition**

Observation- Before treatment, the average Frequency of micturition grade was 1.21, but it decreased to 0.27 after treatment. The score improved by an average of 77.5%, which is considered significant based on the "Wilcoxon signed rank test" results (with a p value of <0.05).

Therefore, it can be concluded that there was a significant improvement in Frequency of micturition related to Garbhini mutrackricchra i.e., Kutaj vati was found to be effective for treating Frequency of urination in cases of Garbhini mutrackricchra.

Statistical Analysis

Effect Of Kutaj Vati on Frequency of Micturition in Garbhini mutrackricchra

Figure no. 9.- Effect on Frequency of micturition

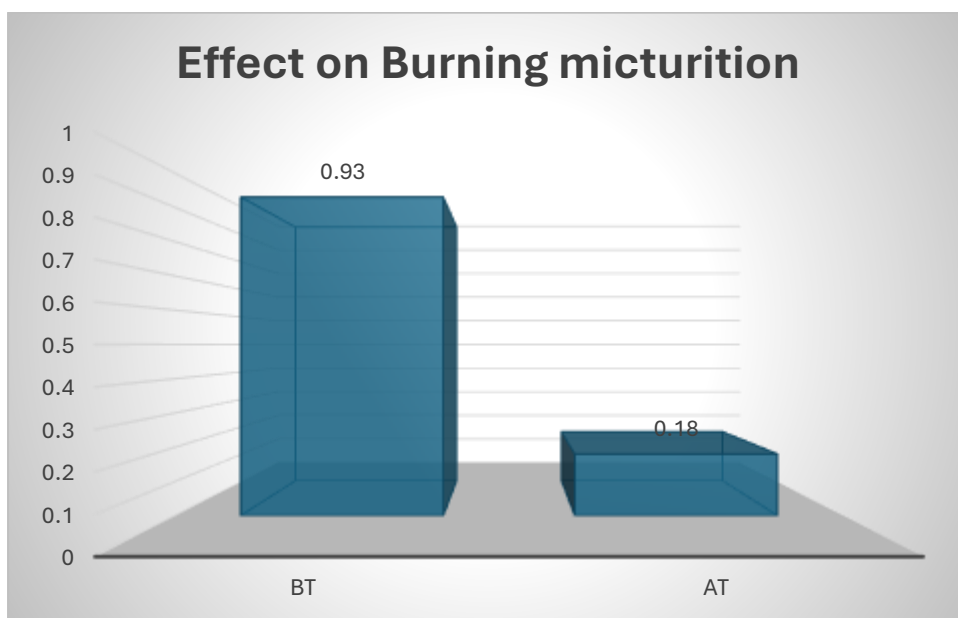


Table no. 11.- Statistical analysis of Frequency of micturition

Parameter	Mean		x	% improvement	Negative rank	Positive rank	Tie	W	P VALUE
	BT	AT							
Frequency of micturition	1.21	0.27	0.93	77.5%	19	0	14	-3.923	<0.001

Objective Criteria

8) **CBC (TLC)**

Table no. 12.- CBC (TLC)

PATIENTS	BEFORE TREATMENT	AFTER TREATMENT
AVERAGE TLC	11254.55/cumm	9657.57/cumm

Observation: The total leucocyte count (TLC) serves as a crucial diagnostic tool for detecting urinary tract infections in pregnant women. As part of a recent study, patients who exhibited elevated TLC were recruited for further analysis. Following treatment, the study revealed a noteworthy reduction in the average TLC levels observed among the participants.

Statistical Analysis

Effect Of Kutaj Vati on CBC (TLC) in Garbhini mutrackricchra

Figure no. 10.- Effect on CBC (TLC)

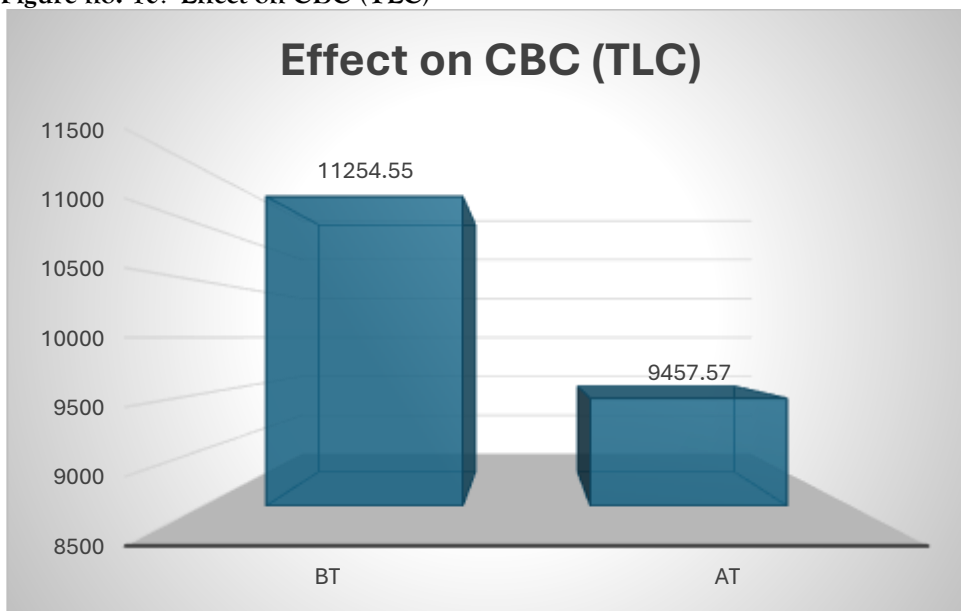


Table no. 13.- Statistical analysis of CBC (TLC)\

Parameter	Mean		x	% of improvement	t	P VALUE
	BT	AT				
CBC (TLC)	11254.55	9457.57	1796.97	15.96%	4.002	< 0.001

Before treatment, the average CBC (TLC) grade was 11254.55, but it decreased to 9457.57 after treatment. There was a significant improvement of 15.96% in the score, as determined by a "paired t test" with a p value of less than 0.05. This suggests that there is a notable improvement in CBC (TLC) related to Garbhini mutrackricchra i.e., Kutaj vati has shown effectiveness in treating Garbhini mutrackricchra as indicated by CBC (TLC) results.

9) **Neutrophil Count:**

Table no. 14.- Neutrophil Count

PATIENTS	BEFORE TREATMENT	AFTER TREATMENT
AVERAGE NEUTROPHIL COUNT	76.84%	71.39%

Observation- The neutrophil count is a valuable diagnostic tool for identifying urinary tract infections during pregnancy. This study focuses on patients with increased neutrophil counts and examines the effects of treatment on reducing these counts. Results show that neutrophil counts are decreased after treatment.

Statistical Analysis

Effect Of Kutaj Vati on Neutrophil Count in Garbhini mutrackricchra

Figure no. 11- Effect on Neutrophil Count

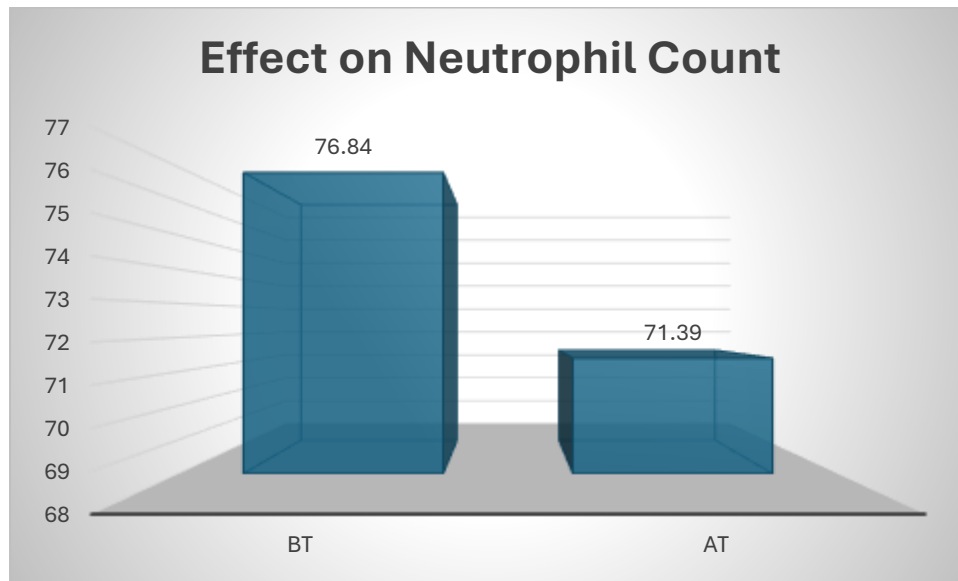


Table no. 15.- Statistical analysis of CBC (neutrophils)

Parameter	Mean		X	% of improvement	t	P VALUE
	BT	AT				
CBC (neutrophils)	76.84	71.39	5.45	7.09%	4.531	<0.001

Before treatment, the average grade of CBC (neutrophils) was 76.84. After treatment, this decreased to 71.39, indicating a significant improvement of 7.09% as observed through a "paired t-test" (with a p-value of less than 0.05). This suggests that there is a noteworthy improvement in CBC (neutrophils) in Garbhini mutrackricchra. i.e., Kutaj vati was effective on CBC (neutrophils) in treating Garbhini mutrackricchra.

10) Pus Cells:

Table no. 16.- Pus Cells

Patients	Before treatment	Percentage	After treatment (relieved)	Percentage of patients with reduced pus cells
Pus cells	25 patients	100	21	84%

The identification of urinary tract infections can be facilitated by the presence of pus cells in urine. In fact, the detection of pus cells in urine is a reliable indicator of an ongoing infection in the urinary tract. This research encompasses even the slightest cases of urinary tract infections, and the standard for assessing the presence of an infection is the detection of more than 5 pus cells in the urine.

Observation- According to the findings of the research, it was observed in 25 patients examined had an increased number of pus cells in their urine prior to undergoing treatment. However, after receiving the prescribed treatment, a significant decrease in pus cells was observed in 21 of the patients, which accounted for approximately 84% of the total sample population. Regrettably, 7 of the patients still exhibited an elevated number of pus cells even after receiving treatment, necessitating additional medical intervention to manage the condition.

Statistical Analysis

Effect Of Kutaj Vati on Urine Pus cells in Garbhini mutrackricchra

Figure no. 12- Effect on Urine Pus cells

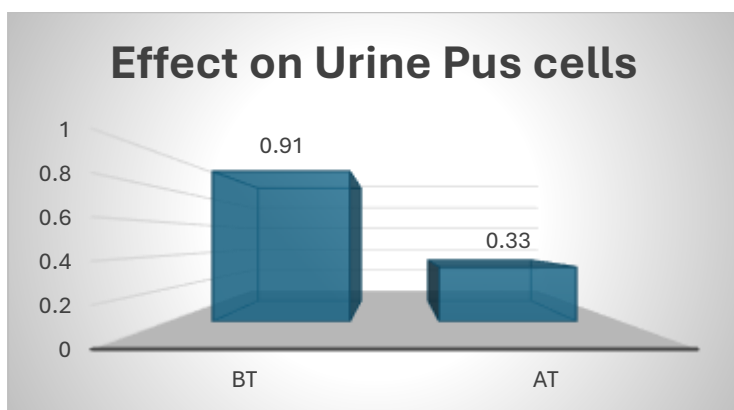


Table no. 17.- Statistical analysis of Urine Pus cells

Parameter	Mean		x	% improvement	of Negative rank	Positive rank	Tie	W	P VALUE
	BT	AT							
Urine Pus Cells	0.91	0.33	0.58	63.73%	21	5	7	3.207	0.001

Before treatment, the average grade of pus cells in urine was 0.91, but after treatment, it decreased to 0.33. The improvement in the score was 63.73%, which was statistically significant based on the Wilcoxon test (with a p-value of less than 0.05). This suggests that there was a significant improvement in urine pus cells for Garbhini mutrackricchra. i.e., Kutaj vati was effective on URINE PUS CELLS in treating Garbhini mutrackricchra.

DISCUSSION: The present study evaluated the clinical efficacy of Kutaj vati in 33 antenatal women with Mutrakricchra. Kutaj vati showed significant efficacy in improving subjective symptoms (burning, pain, frequency of micturition) and objective infection indicators (TLC, neutrophils, pus cells) in pregnant women diagnosed with Garbhini Mutrakricchra. The statistically significant improvements across these parameters underscore its potential as a safe, effective Ayurvedic intervention for managing urinary tract infections during pregnancy.

OBSERVATION: Burning Micturition

- Before treatment, 42.4% of patients experienced burning more than once during urination; 48.5% had no burning.
- After treatment, 81.8% reported no burning, and none experienced frequent burning.
- Average score improved by 80.64%, statistically significant (p < 0.001).

Conclusion: Kutaj vati effectively reduces burning sensation during urination in pregnant women with Mutrakricchra.

Painful Micturition

- Prior to treatment, 63.6% had no pain, 18.2% had occasional pain, 18.2% had pain every urination.

- Post-treatment, 84.8% had no pain, with significant reduction in pain frequency.
- Improvement of 66.67%, statistically significant ($p < 0.001$).

Conclusion: The treatment significantly alleviates pain associated with urination.

Increased Frequency of Micturition

- Before treatment, 48.5% urinated 11-13 times daily; 39.4% urinated 5-7 times.
- Post-treatment, 75.8% had frequency 5-7 times per day; significant reduction in higher frequency categories.
- Improvement of 77.5%, statistically significant ($p < 0.001$).

Conclusion: Kutaj vati normalizes excessive urinary frequency in pregnancy-related urinary disorders.

Total Leukocyte Count (TLC)

- Average TLC decreased from 11,254.55 to 9,457.57 cells/cumm after treatment.
- Improvement statistically significant with $p = 0.001$.

Conclusion: Treatment diminished systemic inflammatory response indicative of infection control.

Neutrophil Count

- Average neutrophil count reduced from 76.84% to 71.39%.
- Statistically significant improvement ($p = 0.001$).

Conclusion: Neutrophilic inflammation decreased, indicating effective antimicrobial action.

Urine Pus Cells

- Before treatment, all 25 patients with elevated pus cells (>5 cells/HPF) had urinary infection.
- After treatment, 84% showed reduction in pus cells, with significant score improvement of 63.73% ($p < 0.001$).

Conclusion: Kutaj vati significantly reduces urinary tract infection markers as evidenced by pus cell reduction.

PROBABLE MODE OF ACTION:

1. **Anti-inflammatory and Analgesic Action:** Kutaj bark contains active compounds like conimine that inhibit the COX-1 enzyme, reducing prostaglandin synthesis. Prostaglandins are mediators of pain and inflammation, so their inhibition results in peripheral anti-nociceptive and anti-inflammatory effects, thereby reducing pain, swelling, and tissue inflammation.
2. **Antibacterial Activity:** The bark is rich in steroidal alkaloids that disrupt bacterial viability by interfering with bacterial cell walls and membranes. Additionally, tannins present in the bark exert astringent effects that inactivate microbial adhesins, enzymes, and transport proteins. Tannins also chelate metal ions like iron, which are essential for bacterial growth, thus exhibiting antimicrobial effects.
3. **Anti-adherence Effect:** Alkaloids in Kutaj reduce the initial adhesion of bacteria such as enteropathogenic *Escherichia coli* to epithelial cells, preventing colonization and subsequent infection.
4. **Antioxidant and Wound Healing:** The bark contains flavonoids and phenolic compounds with antioxidant properties that scavenge free radicals, protect tissues from oxidative damage, and stimulate collagen synthesis and new blood vessel formation, aiding tissue regeneration and wound repair.

CONCLUSION: Garbhini Mutrakricchra, clinically comparable to urinary tract infections (UTI) in pregnancy, is characterized by painful, burning, and frequent urination. It primarily results from doshic imbalances with dominant Vata and Pitta disrupting the Mutravaha Srotas, causing difficulty and discomfort in micturition. Physiological changes during pregnancy, such as increased plasma volume, hormonal-induced ureteral and bladder dilation, and mechanical compression by the growing uterus, predispose expectant mothers to urinary stasis and infections. Most affected women fall within the prime reproductive age of 26-30 years, especially in their second pregnancy and third trimester, highlighting the increased vulnerability due to advancing gestation and multiparity. Clinically, 91% of patients exhibit symptomatic manifestations emphasizing the condition's burden during pregnancy. Therapeutically, Kutaj Vati administered with Godugdha over five days significantly ameliorates urinary symptoms, with painful micturition reducing by 66.67%, burning sensation by 80.64%, and urinary frequency by 77.5%, reflecting Kutaj's classical Pitta-shamaka and anti-inflammatory properties. Objective markers including total leukocyte count, neutrophil count, and urine pus cells also significantly decline, corroborating the drug's anti-inflammatory and antimicrobial effects attributed to its steroidal alkaloids, tannins, and flavonoids. Importantly, Kutaj Vati demonstrates an excellent safety profile without adverse effects, making it especially suitable for pregnancy where antibiotic options are restricted due to teratogenic risks. Mechanistically, Kutaj's multi-modal action—including doshic balancing, microbial inhibition, and

inflammation suppression—supports its role in managing Garbhini Mutrakricchra effectively. Despite study limitations like absence of control group and short follow-up, results suggest Kutaj Vati as a promising alternative or adjunct in antenatal care protocols to reduce infection burden and improve maternal well-being amidst concerns of antibiotic resistance and fetal safety. Future randomized studies are warranted for further validation and integration into clinical practice.

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