

## **Effect of Shwethaparpati in Uncomplicated Lower Urinary Tract Staphylococcal Infection - A case report**

**Krishna Kumar K<sup>1</sup>, Ratnaprava Misra<sup>2</sup>**

<sup>1</sup> PhD Scholar, Mandsaur Institute of Ayurved Education and Research, Mandsaur University, Madhya Pradesh, India.

<sup>2</sup> Professor And Head Department of PhD Studies of Kayachikitsa, Mandsaur Institute of Ayurved Education and Research Mandsaur University, Madhya Pradesh, India

### **ABSTRACT**

The second deadliest disease faced by humanity in this era is considered as Urinary tract infection. Pathogens affecting the genitourinary system include bacteria, virus, fungi, protozoan etc. Among them E-Coli and Staphylococcus are most common. It may cause organ damage which may lead to death. The symptoms are similar to Mootrakruchra narrated in Ayurveda and the management is also found very useful, especially, in this scenario of experiencing antibiotic resistance. This study of Shwethaparpati is one among the anecdotal evidences of success stories experienced by the Ayurvedic community. Pre and post test case reports selected a twenty-year-old female patient diagnosed as having lower urinary tract infection for the last seven months. She was administered the drug Shwethaparpati. The duration of the treatment was for fourteen out-patient days. She was assessed before, after and on follow-up treatment for improvement using subjective and objective assessment criteria. ICD 10 CM-N39.0 is used for the selection and assessment. The subject experienced clinical symptoms and signs of increased frequency and urgency, Dysuria, abdominal pain back pain, burning micturition, tiredness, bacteriuria (Staphylococcus-Sp), pyuria, and hematuria. Initial symptoms were found reduced. On the follow-up it concluded that the bacteria disappeared completely.

### **Key words:**

Staphylococcus, UTI, Shwethaparpati, Mootrakruchra, Lower urinary tract infection

### **Introduction**

Urinary tract infection (UTI) may affect any part of the system - kidneys, ureters, bladder, and urethra which is termed as severe public health problem. Recent reports show that UTI is more affecting the women in the age group of 15-44 than men. The common pathogen is E-coli bacteria found in the rectal area and in the excreta. In females this pathogen may travel through the urethra into the bladder and cause infection. Like E-coli staphylococcus, Klebsiella, viruses, parasites, fungi, and protozoans may also cause UTI. Currently the antibiotics are used as a gold standard to treat this infection in the existing standard of care for destroying the bacteria. But the Public health reports in England, WHO news about antibiotic resistance, reveals that while taking antibiotics the resistance increases and the options for treatment decreases. This is a more alarming situation to find out better solutions. Most similar disease which is described in Ayurveda is Mutrakruchra which is reckoned with its identical symptoms like burning micturition, dysuria, frequency, urgency etc. In staphylococcal species generated UTI, Staphylococcus saprophyticus is common causing infection 5-15% of world population, while Staphylococcus-aureus -bacteriuria is rare. This is a dangerous disease than others. The study is done on a subject affected with LUTI of staphylococcal species. This study of Shwethaparpati is one among the anecdotal evidences of

success stories experienced by the Ayurvedic community. Swethaparpati comes under parpati kalpana of Rasashastra mentioned in Mootrakruchra adhikara for urinary tract disorders. Swethaparpati contains Suryakshara (Potassium-nitrate  $\text{KNO}_3$ ), Sphatika(Potash-alum  $\text{KAl}(\text{SO}_4)_2 \cdot 12\text{H}_2\text{O}$ ) and Navasagara (Ammonium- chloride  $\text{NH}_4\text{Cl}$ ). Suryakshara acts as a diuretic, Sphatika has a strong antibacterial effect, and Navasagara have antimicrobial properties. Mootrakruchra is a type of disease coming under Mootravaha srothodushti vikaras(diseases of channels carrying urine). There are eight types of Mootrakruchra mentioned in “Charaka samhita” they are vataja , pittaja , kaphaja , sannipathaja , ashmarija , sharkaja , shukraja , kshathaja Mootrakruchra.

### Case information

A 20 old female patient with symptoms of LUTI for seven months came to OPD with presenting symptoms. She was advised to take urine analysis with culture and sensitivity test which conformed the pathogen. Blood investigations and USG of the abdomen was also advised to rule out other systemic illness before the treatment.

**Table 1. Showing timeline of the study**

Date	Day of the event	Label of the event	Details of the event	Assesment and Observation
4/02/2020	1 <sup>st</sup> day	Screening	Subjective assessment as per ICD 10 CM-N-39.0 present blood urine and blood	Presented with severe increased frequency, urgency, dysuria, lower abdominal pain, back pain, burning micturition, tiredness, Yellowish turbid Urine with pus cells 3-4 Epithelial cells-15 to 20, Bacteria Present ++ with pH 5.2 Blood RE- ESR-28
6/02/2020	3 <sup>rd</sup> day	Staphylococcal uncomplicated UTI conformation	Urine Culture and sensitivity, USG Abdomen	Organism isolated Staphylococcus .Sp Colony count 50,000 CFU/ML Penicillin resistant

				Ultrasonography report showed normal study
<b>7/02/2020</b>	4 <sup>th</sup> day	Medicine dispersing	Swethaparpati administration	-
<b>22/02/2020</b>	15 <sup>th</sup> day	After treatment	Subjective and Objective Assesment.	All the symptoms of subjective assessment were absent  In urine bacteria was nill Colour of urine clear with no turbidity and viscosity Reaction was Normal pH (6.9) Albumin - absent No pus cells few epithelial cells observed
<b>2/03/2020</b>	28 <sup>th</sup> day	First follow up	Urine RE	No clinical symptoms re appeared Was normal with no bacteriuria Colour yellow Appearance clear Albumin trace Pus cell 1-2 Ep.cell -2-3
<b>12/03/2020</b>	35 <sup>th</sup> day	Second follow up	Urine RE	No clinical symptoms re appeared Was normal with no bacteriuria Colour yellow Appearance clear Albumin trace Pus cell 1-2 Ep.cell -2-3

### Physical examination

On palpation per abdomen patient felt pain on the supra pubic and inguinal region. In musculoskeletal system examination was normal.

### Clinical observation

No signs of fever or severe acute infection, except clinical symptoms of chronic UTI, Increased frequency, urgency, burning, dysuria, lower abdominal pain, back pain & tiredness.

### Report on Urine and Blood examination

Urine analysis before the treatment (BT)(04/02/2020) and after the treatment (AT)(22/02/2020) showed marked improvement. In BT the bacteria identified as Staphylococcal species ( 04/02/2020 and 06/02/2020) which was absent in AT and follow up (FU) (22/02/2020)(AT), 02/03/2020(1st FU) and 12/03/2020 (2nd FU) ). The pus cells present was 3-4 which became few and on FU it showed nil. Albumin was present (+) but it was absent. The epithelial cells also showed remarkable improvement from BT. The RBC found in urine during BT was absent in AT. The Ph has changed from 5.2 to 6.9 range. In blood investigation improvement in Hb% from 12.8 to 13.2 gm / dl and RBC count changed from 4.22 million to 4.51 million, difference in total WBC count, as increased from 5100 to 6200 /cumm. Marked changes observed in ESR 28 mm/hr to 22 mm/hr and differential count . AEC count drastically reduced from 280 to 140 /cumm . The LFT and RFT remained normal. A detailed list of urine and blood investigation showed below.

**Table no 2 . Showing detailed list of urine routine and Blood investigation**

Name of test	04/02/2020(BT)	22/02/2020(AT)	02/03/2020 (1st F)	12/03/2020 ( 2nd F)
<b>Urine routine examination</b>				
<b>Colour</b>	Reddish yellow	Pale yellow	Pale yellow	Pale yellow
<b>Appearance</b>	Slightly turbid	Clear	Clear	clear
<b>Albumin</b>	Present (+)	Absent	Absent	Absent
<b>Sugar</b>	Nil	Nil	Nil	Nil
<b>Pus Cells</b>	3-4 cells /HPF	0-1	Nil	Nil
<b>Epithelial cells</b>	15-20 cells /HPF	0-1	0-1	0-1
<b>RBC</b>	1-2 cells /HPF	Nil	Nil	Nil
<b>Cast</b>	Nil	Nil	Nil	Nil
<b>Chrystals</b>	Nil	Nil	Nil	Nil
<b>Bacteria</b>	Present (++)	Absent	Absent	Absent
<b>Reaction</b>	Acidic	Acidic	Acidic	Acidic
<b>pH</b>	5.2	6.9	6.2	6.5
<b>Blood Investigation</b>				
<b>Hb%</b>	12.8 gm/dl	13.2 gm/dl	-	-
<b>T.WBC</b>	5100/cumm	6200 /cumm	-	-
<b>Polymorph</b>	58%	58%	-	-
<b>Lymphocyte</b>	37%	39%	-	-
<b>Eosinophils</b>	4%	2%	-	-

<b>Monocyte</b>	1%	01%	-	-
<b>Basophil</b>	00%	00%	-	-
<b>ESR</b>	28 mm/hr	22 mm/hr	-	-
<b>Platelet count</b>	2.81 lakhs /cumm	2.43 lakhs/cumm	-	-
<b>RBC count</b>	4.22 million cells / UL	4.51million cells ml/UL	-	-
<b>PCV</b>	38.4 %	39.6%	-	-
<b>MCV</b>	94.3 FI	92.1 FI	-	-
<b>MCH</b>	30.3 pg	30.6 pg	-	-
<b>MCHC</b>	32.2 gm/dl	32.4 mg/dl	-	-
<b>AEC</b>	280/cumm	140 /cumm	-	-

### Diagnostic Assessment

The first mid-stream urine was taken in a sterile container and it is stored with utmost care was sent to the laboratory for investigation. The reports after analysis were collected and documented. The culture report confirmed the presence of Staphylococcal species bacteria with Colony count 50,000 CFU/ML.

**Table No 3.** Showing sensitivity report

Bacteriology report: <b>specimen collected 06/02/2020 report generated 09/02/2020</b>						
Nature of specimen			Urine			
Examination requested			Culture and sensitivity			
Organism isolated			Staphylococcus Species			
Colony count			50,000 CFU/ML			
Antibiotic sensitivity pattern (S-Sensitive, R-Resistant ,I- Intermediate )						
Antibiotic	Zone size		S/R/I	Sensitive mm or more	Intermediate mm	Resistant mm or less
Cloxacillin	17	mm	S	14	10-13	9
Cefazolin	20	mm	S	18	15-17	14
Penicillin	<10	mm	R	29	27-28	26
Linezolid	25	mm	S	23	21-23	20
Azithromycin	20	mm	S	18	14-17	13
Gentamicin	18	mm	S	15	13-14	12
Erythromycin	24	mm	S	23	14-22	13
Amikacin	19	mm	S	17	15-16	14
Ampicillin	18	mm	S	17	14-16	13
Cotrimoxazole	19	mm	S	16	11-15	10
Vancomycin	23	mm	S	21	17-21	16
Clindamycin	22	mm	S	21	15-20	14

<b>Nitrofurantoin</b>	20	mm	S	17	15-16	14
<b>Ciprofloxacin</b>	23	mm	S	21	16-20	15
<b>Tetracycline</b>	19	mm	S	15	12-14	11
<b>Amoxicillin /clavulanate</b>	20	mm	S	18	14-17	13
<b>Ceftriaxone/sulbactam</b>	26	mm	S	21	18-20	17

After the diagnosis, Shwethaparpati 10 grams per unit for fourteen days dosage were given to the patient. The patient was asked to take 3 gms medicine in two and half liters of cold water. In a day, the patient was asked to take prescribed quantity of solution in regular intervals. On the fifteenth day she was advised to come for assessment. The Post-test assessment was done with both subjective (symptoms mentioned under ICD 10 CM-N39.0) and objective urine and blood analysis. The medicine was stopped and was advised to follow up after a seven days. After two follow up and assessment the study was concluded. Assessment of response: Both subjective and objective parameters were used for clinically assessing the response to the treatment. The urine assessment findings were given much importance. The clinical assessment was with using parameters to assess the response of the treatment in presenting signs and symptoms. These signs and symptoms were graded using simple description appropriate scoring was given.

### Discussion

Mootrakruchra occurs due to ama formation and the treatment given is aimed to revert it. During ama condition, the excess waste products formed from food materials. At the initial part of pathogenesis, these waste products vitiate urine and cause the disease. Due to the extreme pH of urine it destructs the tissues of urinary tract which attract the pathogen. Shwethaparpati is alkaline in nature and is used in regulating pH of blood as well as rectifying digestion impairment. The cause of bacterial destruction is due to altering the natural habitat of it. Surya kshara acts as a diuretic, Sphatika has a strong antibacterial effect, and Navasagara maintains Homeostasis in the human body. The initial part of digestion water is formed from food as a byproduct. The Shwethaparpati is excreted through the urine as it is soluble in water. The purpose of Urine is removal of excess water from the body. The analysis of presence of bacteria in the urine emphasizes the effect of Shwethaparpati in uncomplicated lower urinary tract infection. Most of the antibiotics were sensitive and they had shown good zone clearance. The side effects are not reported till now better research potential is seen in this regard.

### Conclusion

At the end of the study all the symptoms observed in the beginning disappeared and the presence of Staphylococcus-Sp. in the urine became absent. Further evaluations with larger samples may yield conclusive results of evidence of this drug in uncomplicated cases of LUTI

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