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## Clinical and therapeutic efficacy of Unani drugs in the treatment of recurrent Uti in geriatric age (Tadia-E-Majari-E-BOL)

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### Abstract

Recurrent urinary infection consist of repeated attacks of symptoms. It is much more common in females than males. But due to BPH as major predisposing factor in males, recurrent infections is much more common in them, in their elderly age. UTIs are the most common of all bacterial infections and can occur at any time in the life of an individual. The present Research study on Recurrent Urinary Tract Infection (RUTI) was conducted on 40 patients, divided in two groups of 20 each and the two groups was treated with separate group of medicine i.e., Group 'A' & 'B'.

The present study explored that dominant humoural incidence of Tadia-e-Majari-e-Bol (urinary tract infection) is more common in Safravi Mizaj and according to Unani text Warm-e-Majari-e-Bol is due to derangement of Safravi Khilt. The investigation data shows most of the patients have pus cells and are bacterial culture positive and some patients have red cells and albumin in urine. After going through their investigation, 20 patients were treated with Group 'A' & another 20 patients with Group 'B' medicine for the period of 6 weeks with a weekly follow up. This research study ultimately concluded that Group 'A' medicine have response as Cured 70%, Partial Response 15% and No Response 15% and response with Group 'B' medicine as Cured 60%, Partial Response 25% and No Response 15%. It can be inferentially started as Group 'A' medicine has better response than Group 'B' medicine. After going through all the observation and results of this study, it is concluded that both the group of drugs were effective in the management of Tadia - e- Majaria-e- Bol (Urinary tract infection). Both the drug groups are safe and free from any side effect on other body organs.

**Keywords:** Humoural, benign prostate hypertrophy, Safravi, Mizaj, Khilt, Tadia, Majari-e-bol, relapse, detrusor, micturition

### Introduction

**Definition of Recurrent UTI:** Recurrent urinary infection consists of repeated attacks of symptoms most often pertaining to the lower urinary tract and associated with significant counts of bacteria known to be urinary pathogens.

Recurrence is often categorized as either reinfection or relapse:

- Reinfection: A reinfection occurs several weeks after antibiotic treatment has cleared up the initial episode and can be caused by the same bacterial strain that caused the original episode or a different one.
- Relapse: It is diagnosed when a UTI recurs within 2 weeks of treatment of the first episode and is due to treatment failure.

Anatomically Urinary system is classified into 1. Upper Urinary Tract comprising of kidney & Ureters 2. Lower Urinary Tract comprising of Bladder, Urethra & Urethral Sphincters.

### The Ureters (Halibain)

- Ureter: "He who knows ureteral obstruction in the female knows not only urology but also gynecology & has a faint idea of some of the problems of obstetrics" (wharton).
- Ureters are a pair of narrow thick walled muscular tubes.
- Each ureter is about 25cm long of which the upper half (5inch) is in the abdomen and the later half (5inch) in the pelvic region.
- It measures about 3mm in diameter but it is slightly constricted at three places i.e., pelvi-ureteral junction, at the brim of the lesser pelvis & at its passage through the wall of bladder.
- Its function is to convey urine from the kidneys to the urinary bladder.

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**The Bladder (Masana)**

- Def.: The urinary bladder is an unpaired musculo-membranous sac which serves as a reservoir for the urine.
- The proper medical term for the bladder is vesical
- Size, shape & position:

It is pyramid shape organs which sits in the pelvis and possess 3 openings-two for the ureters & one for urethra.

- Functional muscle of bladder- DETRUSOR
  - Impressive elasticity
  - Ability to sustain contractions
- Interior of Bladder: Greater part of bladder mucosa shows irregular folds but at its base it is firmly attached and called Trigone.
- Capacity of Bladder- Adult male-220ml, average 120-320ml but filling upto 500ml may be tolerated.
- Blood supply of Bladder:

Arterial supply- vesical, obturator, uterine, gluteal and vaginal arteries.

Venous drainage- venous network drains into Internal Iliac veins.

**The Urethra (Ehleel) & Sphincters**

- Male urethra – is 18-20cm long, running from the bladder to the tip of the penis.
- Female urethra – is 4-6cm long, open to an external hole located at the top of vaginal opening.
- As the female urethra is shorter than the male urethra, it is more likely to get infection from vagina.
- Internal urethral sphincter (Bladder Neck): It is composed of a layer of smooth muscle, surrounded by layers of striated muscle.
- External Urethral sphincter: It is composed of striated muscle, structured and placed differently in males and females.

**The prostate (Ghudda-e-mazi)**

The chest nut-shaped reproductive organ, located directly beneath the bladder in the male, which adds secretions to the sperm during the ejaculation of semen. Its enlargement with age causes Bladder outflow obstruction (BOO).

**Physiology**

- The Micturition Cycle
- Storage (Filling Phase)
- Voiding (Micturition) Phase

**Continence Mechanism**

Continence is dependent on the anatomical structures and also on neurological and muscular (sphincter & detrusor) function. Parasympathetic nerves arising from S2-4 supply the detrusor muscle. These cholinergic nerves stimulate detrusor contraction; resulting in micturition. Sympathetic nerves arising from T10-L2 relay in the pelvic ganglia before reaching the detrusor and bladder neck. Stimulation of these noradrenergic nerves produces detrusor relaxation and contraction of the bladder neck (via  $\alpha$ -adrenoceptors). This assists urine storage and continence during bladder filling.

- Epidemiology: 1% school girls, 2-11% of pregnant women and >10% of elderly women carry >10,000

bacteria/ml of urine.

- It is much more common in female than male.
  - shorter urethra
  - Absence of antibacterial properties such as found in prostatic fluid
  - Hormonal changes affecting of bacteria to the mucosa.

**Review of unani literature**

- As per unani classic text, Inflammation or Warm is a disease. It is a *Marz-e-Murakkab*.
- The causes of disease are best described by the Humoural theory of Hippocrates (Father of Medicine) which postulated that alteration in Kamiyath (Quantity) and Kaifiyath (Quality) of Akhlath i.e., alteration in the Mizaj (Temperament) of Akhlath (Humor) of any organ is the fundamental cause for the establishment of disease.
- In unani Tibb, the word “Inflammation” possesses broader meaning i.e., ‘Any abnormal swelling refers to Inflammation.’
- Shaikh-ul-Rayees has described the types of Inflammation (Warm) on basis of underlying abnormal khilth i.e.,
  - Warm-e-Safravi
  - Warm-e-Damavi
  - Warm-e-Balghami
  - Warm-e-Saudavi

**How Abnormal Khilth is produced?**

- This Question is best solved in unani literature that *Madda-e-Ufunath* is one of the causes of making the temperament of akhlath of any organ, abnormal.
- From the modern concept, we know that the infection is one of the causes of inflammation, which truly satisfies the above theory.
- According to Shaikh-ul-Rayees, the causes of Infection are:
  - a. Abnormal Diet (Raddi Ghiza)
  - b. Abnormal Environment (Raddi Hawa)
  - c. Improper Digestion (Sue Hazam)
  - d. It can be best correlated with the modern concept that the first two points describes the *source of infection* and the last describes the *Host factor's*-responsible for easy acquirement of infection

**Etiology****Source of infection**

The microflora found in anus, vagina, and urethra are identical. Bacteria belonging to the normal bowel microflora colonize the vaginal vestibule, which act as an intermediate reservoir, and then spread to the distal urethra.

**Risk factors**

1. Any abnormality of the urinary tract that obstructs or slows the flow of urine.
2. Catheters, or tubes, placed in the bladder.
3. Diabetes mellitus & immunosuppressed patients.
4. Postmenopausal women with bladder or uterine prolapse.
5. Atrophy of the epithelial membranes of the urogenital tract as a result of declining levels of circulating estrogens in elderly women.

Causes of UTI's	Outpatients	Inpatients
	(%)	(%)
Escherichia coli	53-72	18-57
Coagulase negative Staphylococcus	2-8	2-13
Klebsiella	6-12	6-15
Proteus	4-6	4-8
Morganella	3-4	5-6
Enterococcus	2-12	7-16
Staphylococcus aureus	2	2-4
Staphylococcus saprophyticus	0-2	0.4
Pseudomonas	0-4	1-11

**Causative agent**

E.coli is the most common infecting organism both in elderly women living at home and women resident in an institution.

**Pathogenesis**

**Mechanisms of Pathogenesis**

- A. Entry is normally by ascent from the urethra- usually of fecal organisms and less by blood borne infection.
- B. Host Factors:

**Protecting factors**

- Normal flow of urine.

- Constant sloughing of the epithelial cells lining the urinary tract.

**Predisposing factors**

- Much shorter urethra in females
- Higher number of bacterial receptors on uroepithelial cells in certain women.
- Failure of complete elimination of urine due to anatomic obstruction and neurological disorders.
- Prostate Gland enlargement-BOO

- C. Bacterial factors - The ability of an organism to produce pili is important in that it enables the bacteria to attach to the epithelial cells and thereby avoid elimination. Bacterial surface lectins, associated with fimbriae or in non-fimbrial adhesions, mediate the bending to oligosaccharide sequences in glycoproteins or glycolipids of uroepithelial cells. Attachment to uroepithelial cell receptors is followed by a mucosal inflammatory response. Cytokines are released from, and polymorphonuclear leukocytes recruited to the mucosa. The inflammatory response is triggered by whole bacteria or by mucosa exposure to fimbriae and the lipid A moiety of lipopolysaccharide.

Symptoms 1-4 are sometimes called *irritative voiding symptoms*

## CLINICAL MANIFESTATIONS

- URETHRITIS- discomfort during voiding but usually no symptoms of post-void suprapubic pain or urinary frequency.
- CYSTITIS- it has following symptoms:
  1. Dysuria (painful urination)
  2. Frequency (without increase in amount of urine)
  3. Urgency (the need to urinate without delay)
  4. Nocturia
  5. Haematuria
  6. Polyuria
  7. Oliguria/anuria
  8. Slow stream, Hesitancy and Terminal Dribbling
  9. Suprapubic tenderness
  10. Retention
  11. Pyuria

**Fig 1:** Symptoms 1-4 are sometimes called *irritative voiding symptoms*

**Symptoms referable to the lower urinary tract:**

- Dysuria, Frequency, Urgency- Lower Urinary Tract Infection.
- Impaired urinary flow, hesitancy, dribbling of urine, incomplete emptying of bladder- Bladder Outflow Obstruction.
- Urinary retention, Incontinence, Eneuresis-sphincter or
- Bladder wall dysfunction.

**Diagnostic aspects**

- How is a urinary tract infection diagnosed?
- a. Urinalysis
  - b. Urine Culture
  - c. Ultrasound
  - d. X-Rays
  - e. Intravenous Pyelography
  - f. Cystourethrogram
  - g. Cystoscopy
  - h. Blood cultures

**Diagnostic aspects-unani review**

- Examination of urine- form the backbone of unani diagnosis.
- In unani system of medicine the diagnosis of diseases depends on observation of three things. (1) The pulse (2) The urine and (3) The stool.
- Ancient physicians prefer physical examination of urine before they diagnosed the diseases.
- During the study of urine for physiological or pathological purposes, following parameters should be observed.
- Laun: Color of urine.
- Qiwan: Consistency.
- Safai and Kudurath: Transparency and turbidity.
- Rusub: sediments or suspended particles.
- Meqdar: Quantity
- Raihah: Odour
- Zubd: Foam and Froth

**Differential diagnosis****Acute UTI should be distinguished from**

1. Salpingitis
2. Acute Appendicitis
3. Cholecystitis
4. Diverticulitis
5. Prostate conditions-BPH & Prostatitis
6. Thinning Urethral and Vaginal Walls

**Complications and prognosis**

- Major Complications of UTI:
- Bacteremia
- Chronic pyelonephritis
- Renal abscess
- Death

**Prognosis**

Uncomplicated urinary tract infection - resolves completely with treatment.

Repeated symptomatic infection with anatomical or functional abnormalities of the tract - chronic renal disease.

**Aims and objectives of present study**

The present study of urinary tract infection is designed with the following aims and objectives

- To evaluate the etiological factors in causation of urinary tract infection in age group of elderly.
- To elicit the signs and symptoms.
- To assess the dominant humour.
- To explore the response of certain Unani medicines in the management of Urinary Tract Infection, particularly in Geriatric patients.

**Materials and Methods****Inclusion criteria****Based on following Clinical Manifestations**

- Patients with above age group of 60.
- Patients irrespective of sex.
- Patients with burning micturation.
- Difficulty in micturation
- Urgency of micturation
- Frequency of micturation
- Lower abdominal pain
- Hematuria
- Fever

- Patients with BPH.

**Exclusion criteria**

- Patients below the age group of 60.
- Patients with pregnancy.
- Patients with renal calculi.
- Patients with structural urinary tract disorders eg. Urethral stricture, sphincter damage etc.
- Patients with congenital disease like polycystic kidney etc.

**Selected patients are under study in the following manner**

- History taking
- Physical examination
- Investigations

**Principles of treatment****According to Shaik the Usool-e-Ilaj is of three types**

- Ilajbil Tadbeer (Regimental Therapy)
- Ilajbil Ghiza (Dietotherapy)
- Ilajbil Dava (Pharmacotherapy)
- Ilajbil Yad (Surgery)

**Applications of different types of Ilaj in UTI patients****Ilajbil Tadbeer (Regimental Therapy)**

- Good personal hygiene is important.
- Try not to use colored toilet paper, bubble bath, perfumed soaps, douches, feminine hygiene deodorants, and deodorant tampons and napkins.
- Wear cotton underwear. Avoid wearing tight clothing, such as bodysuits, tight pants and nylon panty hose without cotton liners.
- Avoid using strong soaps and bleaches when washing underclothes.
- Avoid prolonged activities that can aggravate bladder infections, such as bicycling, horseback riding, motorcycling and traveling.
- Urinate when you feel the urge - do not hold urine for long periods of time

**Ilajbil Ghiza (Dietotherapy)**

- Take plenty of water that is 4-5 liters of water per day.
- Avoid Caffeine containing beverages like coffee, tea, cola etc. Caffeine is a diuretic b/c it inhibits renal sodium reabsorption.
- Avoid Alcohol or beverages containing it. Alcohol is a diuretic b/c it inhibits pituitary ADH release.

**Ilaj bil Dava (Pharmacotherapy)**

If Regimental therapy and Dietotherapy does not respond then plan for pharmacotherapy of medicine.

The drugs which are being used in the treatment of UTI are selected and grouped into following groups

- Group 'A'
- *Mudir (Diuretic)*
- *Musaffi (Blood purifier)*
- *Muqawi-e-Asab (Neuro tonic)*
- Group 'B'
- *Mudir (Diuretic)*
- *Muqawi-e-Asab (Neuro tonic)*
- *Namkiyat*



**Selection of drugs for clinical trial**

**Drugs used in the present study are having following pharmacological effects**

1. Diuretic (Mudir), 2. Blood purifier (Musaffi-e-Khoon), 3. Nervine Tonic (Muqawi-e-Asab), 4. Anti-septic, 5. Anti-inflammatory, 6. Stimulant (Muharrik), etc.

**The drugs are selected in two groups- Group 'A' & Group 'B'**

**Group 'A' consists of Powder**

**Formula of Powder**

<i>Jawitri (Myristica fragrans, Houtt)</i>	3 gm/day
<i>Chobchini (Smilax china Linn.)</i>	7.5 gm/day
<i>Aqarqarha (Anacyclus pyrethrum De.)</i>	3 gm/day
<i>Alsi (Linum usitatissimum Linn.)</i>	6 gm/day
Group-A Joshanda:	
Formula of Joshanda:	
<i>Khar-e-Khask (Tribulus terrestris Linn.)</i>	10 gm/day

**Group 'B' consists of Powder**

**Formula of Powder**

<i>Juft-e-baloot (Quercus incana ehyt)</i>	9gm/day
<i>Ajwain desi (Ptycotis Ajowan DC)</i>	6gm/day
<i>Shorah Khalmi (Potassium Nitrate)</i>	125mg or 1 Ratti/day

**Group-B Joshanda**

**Formula of Joshanda**

<i>Khar-e-Khask (Tribulus terrestris Linn.)</i>	10 gm/day
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**Aqarqarha**

Botanical Name	: <i>Anacyclus pyrethrum DC.</i>
Family	: Compositae; Asteraceae
Unani Tibbi Name	: Beekh-e-Babura Hispanic
Products offered	: <i>Flowers, leaves and root.</i>
Specific Action	: Muharrik (Stimulant)
Action	: Cordial, Mufriz-e-Luab-e-Dahen (Sialogogue), Muharrik (Stimulant) and Musakkin (Sedative).

**Tukhm-E-Katan**

Botanical Name	: <i>Linum usitatissimum Linn.</i>
Family	: Linaceae
Unani Tibbi Name	: Katan, Bazarul katan
Products offered	: <i>Seeds oil and flower.</i>
Specific Action	: Useful in Ishale Balghami
Actions	: Muhallil (Resolvent), Mudirr-e Baul (Diuretic). Seeds are aphrodisiac and roasted seeds are astringent. Flowers are Cardiac and Nervine tonic.

**Jawitri**

Botanical Name	: <i>Myristica fragrans, Houtt</i>
Family	: Myristicaceae
Unani Tibbi Name	: Jawitri
English Name	: Mace (Arillus)
Products offered	: Dried seed, Nutmeg, Arillus (mace) surrounding the Seed & Wood.
Specific Action	: Absorbent (Mujafif-e-rutubat).
Actions	: Stomachic, Carminative, Digestive, Aphrodisiac & stimulant, Antiseptic,

Resolvent, Deobstruent

**Chobchini**

Botanical Name	: <i>Smilax china Linn.</i>
Family	: Liliaceae
Unani Tibbi Name	: Khashab al Seeni/Chobchini
English Name	: China Root/Wild Sarsaparilla
Products offered	: <i>Rhizomes/Root tubers.</i>
Specific Action	: Muaddil (Alterative) and Mudir-e-Baul (Diuretic).
Actions	: Mulattif (Demulcent), Muharrik (Stimulant), Musaffi-e- Dam (Blood Purifier), Muqawwi (Tonic).

**Khar-E-Khask**

Botanical Name	: <i>Tribulus terrestris Linn.</i>
Family	: Zygophyllaceae
Unani Tibbi Name	: Khar-e-khask, Azras al-Ujooz, Hasak
Products offered	: <i>Fruits</i>
Specific Action	: Diuretic (Mudirr-e-Baul).
Actions	: Cooling, Mudirr-e-Baul (Diuretic), Mufattit-e-Hasat (Lithotriptic), Mulaiyyin (Laxative), Tonic, Muqawwi-e-Bah (Aphrodisiac).

Therapeutic Uses : Fruit is useful in painful micturition. Decoction of fruits is efficacious in dissolving renal and bladder calculi. In form of infusion useful as a diuretic, in gout, kidney diseases and gravel.

**Ajwain**

Botanical Name	: <i>Ptycotis ajowan, DC</i>
Family	: Umbelliferae
Unani Tibbi Name	: Ajwain
English Name	: Bishop's Weed, Omum (seeds)
Products offered	: <i>Fruits (seeds)</i>
Specific Action	: Kasurriyah (Carminative), Muqavvi-e-Meda (Stomachic).
Actions	: Muharrik (Stimulant), Muqavvi (Tonic), Musakkin (Sedative), Daf-e-thashannuj (Antispasmodic) actions.

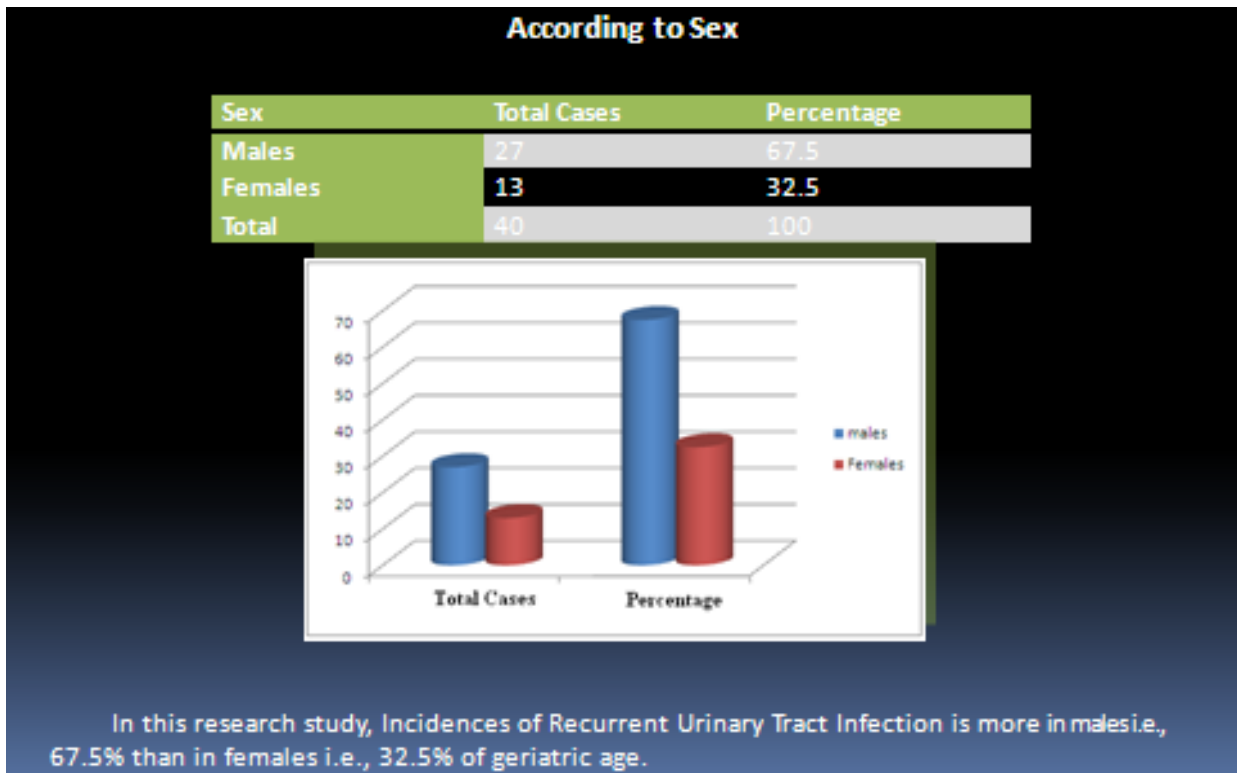
**Shora Khalmi**

Biochemical Name	: <i>Potassium Nitrate</i>
Unani Tibbi Name	: Shora Khalmi
English Name	: Saltpetre, Nitre, Nitrate of Potash,
Purified Nitre	
Specific Action	: Mudirr-e-Baul (Diuretic)
Actions	: Action on Urinary tract as: Efficient Diuretic, Disphoretic, and Refrigerant.

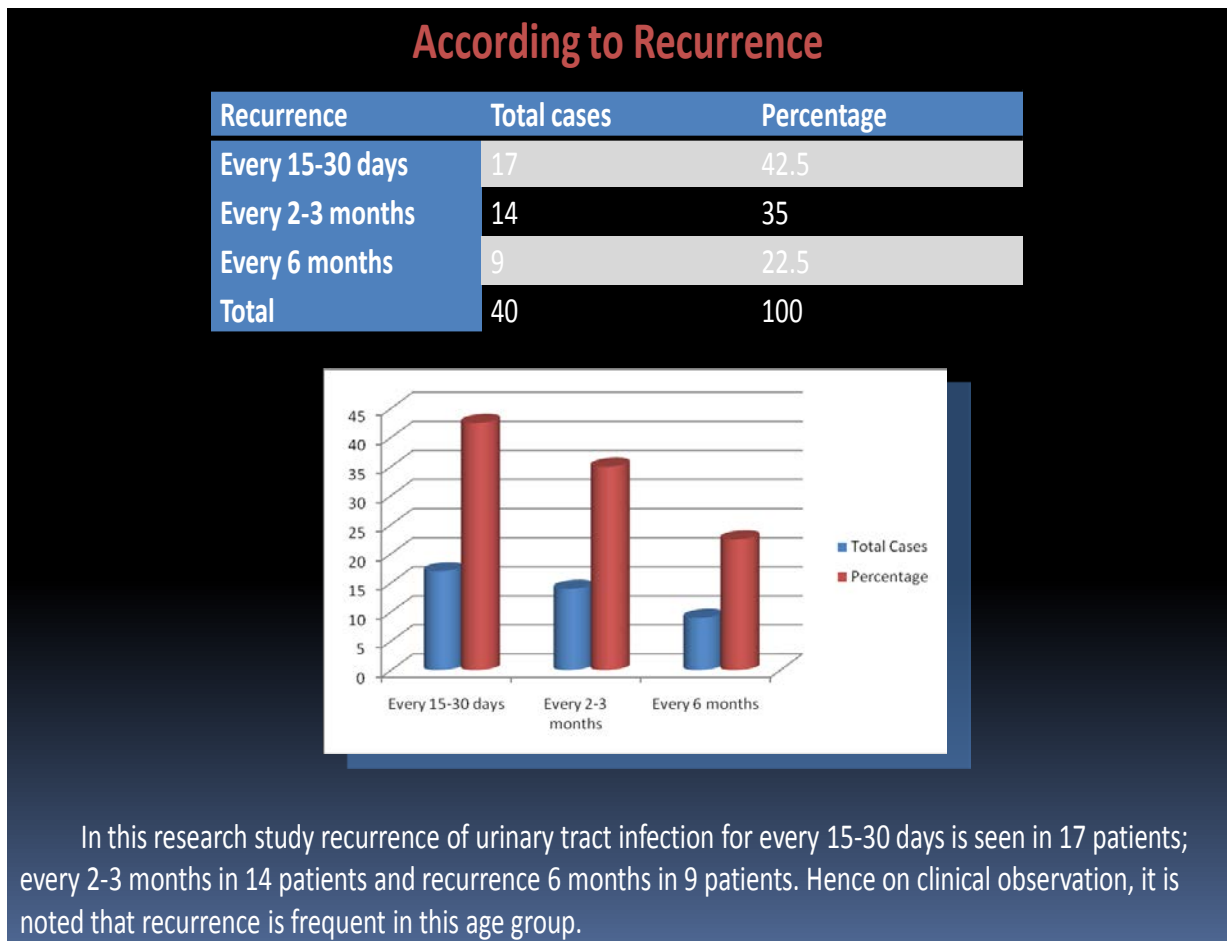
**Juft-e-Baloot**

Botanical Name	: <i>Quercus incana, Roxb.</i>
Family	: Cupuliferae
Unani Tibbi Name	: Juft-e-baloot
English Name	: Oak tree
Products offered	: Fruit
Specific Action	: Astringent & Hemostatic
Actions	: Diuretic, Astringent, Absorbent and Hemostatic

**Table 1:** Incidence of Recurrent Urinary Tract Infection (RUTI) (Tadia-e-Majari-e-Boll)



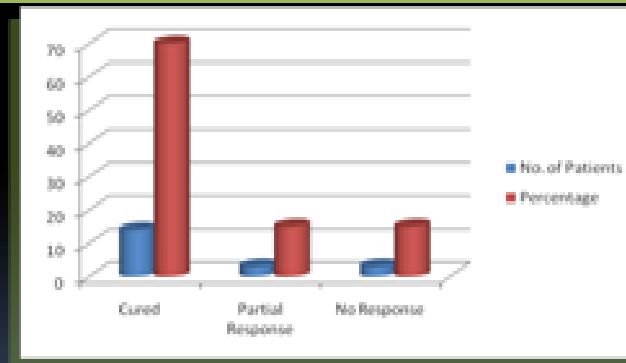
**Table 2:** Incidence of Recurrent Urinary Tract Infection (RUTI) (Tadia-e-Majari-e-Bol)



**Table 3:** Incidence of Recurrent Urinary Tract Infection (RUTI) (Tadia-e-Majari-e-Bol)

### According to Therapeutic Response in Gr.A patient

Response	No. of Patients	Percentage
Cured	14	70
Partial Response	5	25
No Response	3	15
<b>Total</b>	<b>20</b>	<b>100</b>

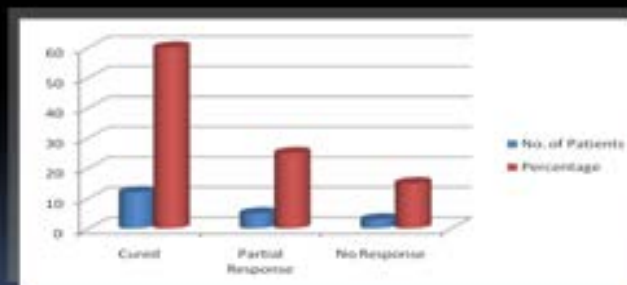


The therapeutic efficacy of Group A medicine was evaluated as cured 70%, partial response 15% and no response 15%.

**Table 4:** Incidence of Recurrent Urinary Tract Infection (RUTI) (Tadia-e-Majari-e-Bol)

### According to Therapeutic Response in Gr.B patient

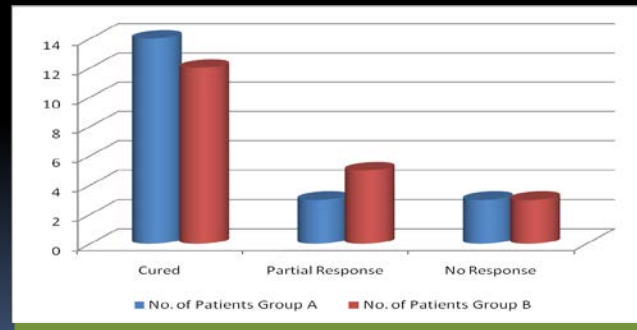
Response	Patients	Percentage
Cured	12	60
Partial Response	5	25
No Response	3	15
<b>Total</b>	<b>20</b>	<b>100</b>



The therapeutic efficacy of Group B medicine was evaluated as cured 60%, partial response 25% and no response 15%.

**Table 5:** Comparative Study of Management between Group A and Group B medicine

Response	Group A		Group B	
	No. of Cases	Percentage	No. of Cases	Percentage
<b>Cured</b>	14	70	12	60
<b>Partial Response</b>	3	15	5	25
<b>No Response</b>	3	15	3	15
<b>Total</b>	20	100	20	100



The graph shows management of UTI with group-A medicine indicating good response i.e., 70% when compared to treatment with Group-B medicine but symptomatic relief with Group-B medicine was also efficient.

#### Discussion, observation and results

The present Research study on RUTI was conducted on 40 patients, divided in two groups of 20 each and the two groups were treated with separate group of medicine i.e., Group 'A' & Group 'B'.

Discussion was made on following aspects, followed with an Observation on patients

1. The dominant humoral incidence of Tadia-e-majari-e-bol (RUTI) recorded in study is Safravi Mizaj – According to unani text warm-e-majari-e-bol is due to derangement of safravi khilt.
2. RUTI is commonly prevalent in elderly group and in males than females due to BPH.
3. In females it is commonly seen after menopause, due to atrophy of urogenital epithelium.
4. It is also common in females who had prolonged labor which causes weakness and prolapsed of bladder wall causing frequency & incomplete voiding and who had frequent history of white discharge.
5. The recurrence for every 15-30 days is seen in maximum no. of patients.
6. The investigation reports concluded that pus cells & albumin was present in more than half of the cases.
7. Nearly 75% cases were sensitive to culture. The commonly encountered microorganism is E-coli.
8. The common USG finding in them was BPH with cystitis.
9. The ultimate inference regarding the study is that the Group A has better response over Group B medicine but the response of Group B cannot be overruled and both the groups are safe and free from any side effects on other organs of the body. So any of the two drugs can be given safely in the management of Tadia-e-majari-e-bol (RUTI).

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