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Review Article

Taming UTIs Triggered Urge Incontinence!

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Abstract

Most people pee 6 or 7 times every 24 hours. Peeing between 4 and 10 times daily may be considered healthy if the frequency does not interfere with the person's quality of life.

Physiologically, urinary frequency depends on age, bladder size, fluid intake, alcohol and caffeine intake. Pathological changes in frequency occur due to Urinary Tract infections, Overactive bladder, Interstitial cystitis, Diabetes, Blood calcium levels both Low calcium (hypocalcemia) or high calcium (hypercalcemia) affect kidney function and urinary output, Sickle cell anemia, an enlarged prostate, Pelvic floor weakness as a result of giving birth or aging, the use of certain medications called diuretics, Tricyclic Antidepressants, Antihistamines, decongestants, Calcium Channel Blockers, Mood stabilizers, antipsychotics, SGLT2 inhibitors, Alpha Blockers and Opioids supplements like high doses of Vitamin D, Vitamin C, Calcium, and caffeine or pamabrom . Frequent urination usually does not require treatment if it does not affect happiness or quality of life or there is no underlying condition and the frequency.

However, Urge Urinary Incontinence (UUI) is a condition characterized by sudden, overwhelming urge to urinate, a common type of urinary incontinence across the world, sometimes referred to as an overactive bladder. This condition arises when the bladder muscles contract involuntarily, creating a strong & sudden need to urinate, even when the bladder isn't full. It not only disrupts the affected person's day but also takes a toll on confidence & quality of life & may even lead to embarrassing situations making living frustrating!

Materials & Methods: This article is based on managing a sort of outbreak of urinary urge incontinence of four cases, three menopausal females and one elderly male due to UTIs from mid-May to June end 2025. They were treated with empiric antibiotic therapy.

Outcome: While 2 females' outcome was satisfactory (relief within 24-48 hours) and one case recurred twice after 2 weeks7 continues to be under observation. The male case has also improved a lot, but due to benign prostate hypertrophy (BPH) and interruption in the treatment of BPH, is taking more time and may need further investigation.

Keywords: tract infections; urethritis; cystitis; nephritis; pyelonephritis; overactive bladder; antibiotics; fluid management; urine culture & drug sensitivity tests

Abbreviations: Incontinence; UUI= Urge Urinary Incontinence; SUI=Stress Urinary Incontinence; UTIS= Urinary

Introduction

Urge Urinary incontinence is a condition characterized by sudden, overwhelming urge to urinate, often leading to involuntary urine leakage before reaching the toilet. It's a common type of urinary incontinence across the world, sometimes referred to as an *overactive bladder.* This condition arises when the bladder muscles contract involuntarily, creating a strong & sudden need to urinate, even when the bladder isn't full. It not only disrupts affected person's day but also takes a toll on confidence & quality of life & even lead to embarrassing accidents. Living with an overactive bladder is frustrating [1].

A mild urinary tract infection (UTI) can cause temporary urinary incontinence, particularly in women. UTIs irritate the bladder and urethra, causing them to become more sensitive and easily triggered, However, once the infection is treated, the incontinent symptoms improve. While UTIs can trigger, not all UTIs cause incontinence. Many people with UTIs don't experience leakage. Urinary incontinence can also be caused by other factors like weakened pelvic floor muscles, overactive bladder, nerve damage, or hormonal changes [3,4].

A urinary tract infection (UTI) refers to an infection in any area of the urinary tract namely: i) *Urethritis:* An inflammation of the urethra, usually caused by an infection a sexually transmitted disease such as chlamydia ii) *Cystitis:* An infection in the bladder that has often moved up from the urethra, iii) *Nephritis* is any type of kidney inflammation iv) *Pyelonephritis* is an infection in one or both kidneys, with worse symptoms during urination. If pain is accompanied by a fever, persistent genital, stomach, or lower back pain, it is a kidney infection than a bladder infection. [2].

Health care Providers often do not think about treating genitourinary symptoms of menopause (GSM) in women who are not sexually active. Vaginal symptoms of Untreated (GSM) can lead to serious complications like urinary tract infections (UTIs) that increase the risk for sepsis and, in rare cases, vulvovaginal obliteration [4,6].

Urinary incontinence in men is linked to prostatitis, particularly chronic bacterial prostatitis, benign prostatic hyperplasia (BPH) & prostate cancer. Prostatitis the inflammation of the prostate gland, chronic bacterial prostatitis is a specific type of prostatitis that requires long-term antibiotic treatment, Benign Prostatic Hypertrophy (BPH) presses on the urethra, causing urgency, leakage and urinary retention and Prostate cancer or a side effect of its treatment cause incontinence [9,10].

This article is based on witnessing a sort of outbreak of urinary incontinence in mid-May to June end 2025 in author's practice. Four cases three menopausal females and one elderly male were treated with empiric antibiotic therapy and outcome was satisfactory (relief within 24-48 hours) and one case recurred twice after 2 weeks.

Case Reports:

Case 1: Ms. Vandana a menopausal woman aged about 55yrs, mother of three grown up children youngest being 30-year-old son, lands up in the clinic on 18 May 2025 with complaints of frequent micturition (6 times) overnight disrupting her sleep as there was discomfort while passing urine few minutes after. After Taking urine sample for culture and sensitivity, she was put on Bactrim DS Tablet (a combination of Sulfamethoxazole-800mg + Trimethoprim-160mg) twice a day and Alkacitral (Disodium Hydrogen Citrate) syrup 10 ml every 6th hour. By noon she was comfortable and that night she could sleep without disruption. After the completion of therapy for 5 days, there has been no recurrence.

Case 2. Ms. Dviya, called around 1900 hrs. on 10 June 2025, reported that her mother-in-law Ms. Kalavathy, aged 68 years was having frequency of micturition every half an hour in the last four hours, and discomfort while peeing but no leakage. She was advised to get Bactrim DS Tablet (a combination of Sulfamethoxazole-800mg + Trimethoprim-160mg) twice a day and Alkacitral (Disodium Hydrogen Citrate) syrup 10 ml every 6th hour. If not relieved of the issue in 48 hrs., to collect urine sample on the morning 12 June and get it tested for culture & antibiotic sensitivity in the nearest laboratory. By next morning after just one dose, she was comfortable and slept well though got up for urination thrice. After 48 hrs. she reverted to her natural frequency but was asked to complete the course of therapy for 5 days, there has been no recurrence since 15 June.

Case 3. Ms. Shobha Kumar, aged 54 years menopaused a decade ago, had similar problem on 20th June 2025. Apart from incontinence the previous night she had abdominal gaseous distension problem. She was travelling last week for a religious temple run. She was also put on Bactrim DS Tablet (a combination of Sulfamethoxazole-800mg + Trimethoprim-160mg) twice a day and Alkacitral (Disodium Hydrogen Citrate) syrup 10 ml every 6th hour. On 23 she reported it to be normal, but on 24th she had a similar event, and was asked to continue the tablets, but on 25th night she had similar episode of gaseous distension and urinary frequency between 2200 hr. and 0030 hrs. on 26th morning. With symptoms of vaginitis. She is under follow up.

Case 4. Sridhar Joshi a male aged about 75 years, known case of Hypertension, CKD, BPH and having undergone bilateral knee Replacement surgery 6 weeks ago, complaints of incontinence since 19 June 2025. On inquiry it was learnt that he had stopped taking Urimax {Tamsulosin- 400 mcg daily, for benign prostatic enlargement to help to relieve symptoms like difficulty in passing urine} for a month around Knee surgery. Suspecting Prostatitis and cystitis he was also prescribed Bactrim DS Tablet (a combination of Sulfamethoxazole-800mg + Trimethoprim-160mg) twice a day and Alkacitral (Disodium Hydrogen Citrate) syrup 10 ml every 6th hour and continue using Urimax and advised to consult urologist if symptoms are not relieved. He reported feeling better after 48 hrs. and now almost back to his normal schedule.

Discussions

Urge Urinary urge incontinence is condition characterized by a sudden, overwhelming urge to urinate, often leading to involuntary urine leakage before reaching the toilet. It's a common type of urinary incontinence, sometimes referred to as an overactive bladder. This condition arises when the bladder muscles contract involuntarily, creating a strong and sudden need to urinate, even when the bladder isn't full. It not only disrupts an affected individual's day but takes a toll on confidence & quality of life and can even lead to embarrassing accidents. Living with an overactive bladder is frustrating [1,2].

Among the causes i) the most common cause is the detrusor muscle contracting too often, creating a frequent and urgent need to urinate, ii) Urinary tract Inflammations or infections (UTIs) which irritate the bladder and increase the urge to urinate iii) Neurological conditions like stroke, Parkinson's disease, multiple sclerosis, and spinal cord iv) Diabetes affects nerve function and bladder control and v) other factors like constipation, enlarged prostate, certain medications, and even excessive fluid intake can also contribute [3].

A mild urinary tract infection (UTI) can cause temporary urinary incontinence, particularly in women. UTIs irritate the bladder and urethra, causing them to become more sensitive and easily triggered, However, once the infection is treated, the incontinent symptoms improve. While UTIs can trigger, not all UTIs cause incontinence, many don't experience leakage, said a poster presented in Annual Meeting 2025 of American College of Obstetricians & Gynecologists [8]. The poster also reported that more than 500 patients older than 40 years initially had an abnormal Pap, among them more than 90% showed a full cytological resolution within 4-6 months after local vaginal estrogen therapy, confirming that estrogen deficiency-induced cellular atrophy mimics dysplasia, often resulting in false diagnoses. About 2.5% of GSM cases had vulvovaginal obliteration with partial or complete labial fusion in patients aged 62-92 years. [8].

The main difference between a bladder infection and a kidney infection is when bacteria have built up and infected the urinary tract system. Although most kidney infections result from untreated bladder infections migrating to kidneys, kidney infections can occur in other ways too. Overall, bladder infections are more common than kidney infections and considered as less complicated, since kidney infections can lead to serious illness through the bloodstream. *A critical difference between bladder infection and kidney infection symptoms is the infection migrating to the kidneys and therefore, the signs and symptoms of a bladder infection that can remain the same even after the infection spreads to the kidneys include* a) A fever remaining under 101^0 Fahrenheit b) Pain &pressure in the pelvis c) Painful or burning urination d) Dark and cloudy red colored urine from blood e) Bad-smelling urine and vi) Pain in the abdomen. Additional signs & symptoms that indicate an infection has spread to the kidneys include nausea vomiting, chills, shaking, a fever exceeding 101^0 Fahrenheit and, in the elderly-confusion.

Epidemiology & Magnitude of Bladder Control:

Globally, urinary incontinence affects an estimated 8.7% of women, with studies reporting prevalence rates between 23% and 55%, similarly the global prevalence of fecal incontinence is estimated to be around 8.0%. In India, urinary incontinence prevalence varies, between 20% and 42%. A study by the International Continence Society indicates that 10-20% of Indians experience some form of urinary incontinence, with higher rates observed in women, especially postmenopausal women. While precise figures for India are less readily available for Fecal Incontinence, the global estimates suggest a significant number of people in India are affected by fecal incontinence too.

Urinary incontinence (UI) is a prevalent condition in India, with studies reporting varying prevalence rates, ranging from 20% to over 42% among women. The condition is more common among women and tends to increase with age, particularly in those over 55. While Stress incontinence is the major

type of urinary incontinence in the postmenopausal women, in young age majority suffering from stress urinary incontinence. A study in India found a prevalence of 29.36% among young, healthy females, with the most common type being stress incontinence. Another study reported a prevalence of 29.4% in women, with stress incontinence being the most common type (52.43%), followed by urge incontinence (29.12%). A community-based study in North India found that 26.8% of women aged 35 and older experienced UI. The incidence of UI can increase with age, with over 40% of women aged 60 and above experiencing moderate-to-severe forms of the condition [3,4,5].

Factors Associated with UI: The prevalence of UI tends to increase with age, particularly in women over 55. Studies have shown a link between parity (number of pregnancies) and the risk of UI, with higher parity being associated with a greater risk. Vaginal delivery, prolonged labor, and the use of forceps during delivery have been identified as potential risk factors for UI. Chronic cough, recurrent urinary tract infections, and diabetes have been identified as independent risk factors for UI. Studies have also indicated that chronic constipation and smoking may be associated with an increased risk of UI. *Inactivity has been associated with a higher risk of UI, suggesting that regular physical activity may be protective [6,7].*

Impact of UI: UI has a significant impact on a woman's quality of life, potentially affecting their physical activity, social interactions, and emotional well-being. Some individuals experience severe incontinence, leading to limitations in daily activities, social isolation, & emotional distress. The good news is that people don't have to live with it. Bladder training is a proven treatment approach that helps reduce symptoms of urinary incontinence. The technique involves learning to urinate on a schedule (called timed voiding) and doing pelvic muscle exercises. The treatments are becoming more effective and less invasive. There is a need for increased awareness and access to treatment options for women with UI in India.

Diagnosis of Incontinence:

The diagnostic evaluation of urinary incontinence involves a combination of history taking, physical examination, and various tests. An Initial assessment focus on identifying reversible causes and categorizing the incontinence as stress, urge, or mixed.

Diagnostic effort begins with detailed information about the onset, duration, severity, & triggers of incontinence, as well as past medical history, medications, & previous treatments, if any. Then the Physical Examination includes a pelvic exam in women to assess pelvic floor muscle strength and a rectal exam in men to check for prostate enlargement. A "stress test" by coughing or straining helps identify stress incontinence. This is followed by routine urinalysis to check for infection, blood in the urine, or signs of diabetes. Post-void Residual (PVR) Urine measurement test determines the amount of urine left in the bladder after voiding, which can indicate incomplete bladder emptying. Asking patients to record fluid intake, urination frequency, and leakage episodes over the next 24-48 hrs. follows.

Do you leak urine (even small drops), wet yourself, or wet your pads or undergarments	Never	Rarely	Occasionally	Often	Mostly	All the time
1. when you cough or sneeze?						
2. when you bend down or lift something up?						
3. when you walk quickly, jog or exercise?						
4. while you are undressing to use the toilet						
5. Do you get such a strong and uncomfortable need to urinate that you leak urine (even small drops) or wet yourself before reaching the toilet?						
6. Do you have to rush to the bathroom because you get a sudden, strong need to urinate?						
Scoring: Each item scores 0 (None of the time), 1 (Rarely), 2 (Once in a while), 3 (Often), 4 (Most of the time) or 5 (All of the time). Responses to items 1, 2 and 3 are summed for the Stress score; and responses to items 4, 5, and 6 are summed for the Urge score.						

Table 1: The Questionnaire for female Urinary Incontinence Diagnosis (QUID)

Urodynamic Testing to assesses bladder function, including pressure and urine flow, to evaluate the underlying cause of incontinence may be required in few cases. Cystoscopy in which a thin tube with a camera is inserted into the urethra to visualize the bladder and urethra for abnormalities. Imaging Tests like X-rays, ultrasound, or CT scans may be used to visualize the urinary tract and rule out other conditions if antibiotic and other therapies do not resolve the problem. Pad Test in which the patients wear a special pad to collect urine leakage, which is then weighed to quantify the amount of leakage. A brief neurological exam helps assess the function of nerves that control the bladder and pelvic floor.

Burden of UUI in India:

In community-based research with a quantitative and qualitative assessment using mixed method approach among 457 women residing in urban slum of Ahmedabad city, India. A modified pre-evaluated standard questionnaire developed by International Consultation on Incontinence Questionnaire (ICIQ) was used for quantitative part. Qualitative part consisted of Focused Group Discussions (FGD) which was carried out amongst the women in batches of 5-7 per discussion at the nearest Anganwadi center. The results reported included: Prevalence of UI was found to be 30%. A statistically significant relation was seen between the presence of UI and age, marital

status, parity, history of abortion, and occurrence of urinary tract infection (UTI) in the last year ($P < 0.05$). Comparison of severity of UI by calculating ICIQ score showed statistically significant relation of same age, occupation, literacy, socioeconomic status, and parity ($P < 0.05$). More than 50% of women suffering from UI were having chronic constipation, reduced daily sleep, and diabetes. Only 7% of the total women suffering from UI had consulted doctor for their problem [4].

Another cross-sectional study conducted QUID questionnaire for female urinary incontinence diagnosis and questions to assess the severity of urinary incontinence among 323 young females aged between 18 to 45 years from month of December 2017 to October 2018. The prevalence of UI was 29.36% (323 out of 1100). Of the total female having incontinence, highest numbers were found to have stress incontinence (51.70%, 167/323) followed by mixed (37.15%, 120/323) and urge incontinence (11.15%, 36/323). Out of 323 subjects 214 (66.25 %) were young healthy females aged between 18 to 35 years having complained of urine leakage. The majority (55.60 %) were suffering from stress urinary incontinence at young age [5].

In another study among all postmenopausal women of age 45–90 years visiting the OBG Department of Amrita Institute of Medical Sciences in the months of May and June 2018 assessed for urinary incontinence using QUID questionnaire - a six-item urinary incontinence diagnostic questionnaire to diagnose & differentiate stress, urge and mixed incontinence. The Results reported were: The prevalence of urinary incontinence was 26.47%, stress urinary incontinence contributing 13.9%, mixed urinary incontinence 7.2%, and urge urinary incontinence 5.4%. Chronic cough, recurrent urinary tract infections (UTI), and prolonged duration of labor were independent risk factors associated with urinary incontinence in postmenopausal women [6].

A study among the population around SRM-IMS, Bareilly. Total 464 women were interviewed out of 2860 total inhabitants and 236 females were selected. 28 women had urinary incontinence, making overall prevalence of urinary incontinence about 12%. There was a significant association of increasing age and presence of urinary incontinence. 22% women had stress urinary incontinence, 38% had urge incontinence & 38% had mixed type of urinary incontinence [7].

In a hospital-based cross-sectional study conducted from August 2005 to June 2007 included women attending gynecology OPD (consulters) and hospital employees (non-consulters). Subjects who were incontinent were asked a standard set of questions. Incontinence was classified as urge, stress, or mixed based on symptoms. A univariate & multivariate analysis looked at risk factors reported that: Of 3000 women enrolled, 21.8% (656/3000) women were incontinent. There was no significant difference in incontinence rate between consulters and non-consulters [618/2804 (22.1%) vs. 38/196 (19.4%); P value = 0.6). Of the total women having incontinence, highest numbers were found to have stress incontinence [73.8% (484/656)] followed by mixed [16.8% (110/656)] and urge incontinence [9.5% (62/656)]. Age more than 40 years; multiparity; postmenopausal status; body mass index more than 25; history of diabetes and asthma; and habit of taking tea, tobacco, pan, and betel are risk factors found to be associated with increased prevalence of urinary incontinence in univariate analysis. On multivariate analysis, age more than 40 years, multiparity, vaginal delivery, hysterectomy, menopause, tea and tobacco intake, and asthma were found to be significantly associated with overall incontinence. Stress incontinence was separately not associated with menopause. Urge incontinence was not associated with vaginal delivery [6].

In various studies using the same definition on similar population, prevalence was 25–45%. Other studies using the same population, but different definitions (any leakage in previous 30 days) reported a prevalence of 35–37%.

Urinary incontinence in men is linked to prostatitis, particularly chronic bacterial prostatitis, or benign prostatic hyperplasia (BPH) or prostate cancer. Prostatitis the inflammation of the prostate gland, causes symptoms like frequent urination, urgency, and pain. Chronic Bacterial Prostatitis is a specific type of prostatitis that requires long-term antibiotic treatment, and Benign Prostatic Hypertrophy (BPH) presses on the urethra, causing urinary retention, urgency, and leakage. Incontinence can be a symptom of prostate cancer or a side effect of its treatment. Types of Urinary Incontinence in Men include i) Stress Incontinence: Leakage due to physical exertion, like coughing or sneezing ii) Urge Incontinence: Sudden, strong urge to urinate followed by leakage iii) Overflow Incontinence- Inability to fully empty the bladder, leading to leakage iv) Mixed Incontinence: Combination of different types of incontinence [9,10].

Treatment in men involve i) Lifestyle Changes- Fluid management, dietary adjustments (avoiding caffeine, alcohol), and pelvic floor exercises (Kegels) and Alpha-blockers for BPH, anticholinergics for overactive bladder, or antibiotics for prostatitis [10,11].

Management of UTIs Triggered Urge Incontinence:

Urge incontinence triggered by a urinary tract infection (UTI) is managed by treating the UTI and addressing the urge incontinence symptoms. Treatment includes antibiotics for the infection, behavioral therapies, medications, or other interventions to manage the urge incontinence.

UTIs treatment starts with empirical antibiotics, chosen based on the local specific bacteria causing the infection and their susceptibility to different medications. If there is no reduction of the symptoms in 24-48 hours, urine sample is sent for culture and drug sensitivity test and antibiotic changed based on the results. Drinking plenty of fluids, especially water, helps flush out bacteria and can alleviate symptoms & over-the -counter pain relievers like ibuprofen or acetaminophen help manage discomfort of a UTI. More severe UTIs, like those involving the kidneys (pyelonephritis), may require different or stronger antibiotics like Ciprofloxacin or Levofloxacin. It's important to note that antibiotic resistance is a growing concern

1. Treating the UTI: Empiric antimicrobial therapy must be comprehensive and should cover all likely pathogens in the context of the clinical setting. For a UTI-triggered urinary incontinence in India, common and effective antibiotics include Nitrofurantoin, Trimethoprim-Sulfamethoxazole, and Fosfomycin, with Nitrofurantoin often being a first-line choice for uncomplicated UTIs, especially in women. The specific antibiotic and treatment duration will depend on the severity and type of infection, as well as individual patient factors like patient allergies, other medications, and overall health status play a role. Commonly used antibiotics in India are:

Ciprofloxacin (Cipro): Ciprofloxacin is a fluoroquinolone with activity against pseudomonads, streptococci, methicillin-resistant S aureus (MRSA), S epidermidis, and most gram-negative organisms, but it has no activity against anaerobes. This agent inhibits bacterial deoxyribonucleic acid (DNA) synthesis and growth and is indicated for urinary tract infections (UTIs) and chronic bacterial prostatitis.

Levofloxacin (Levaquin): Levofloxacin is a fluoroquinolone with better gram-positive activity but less activity against Pseudomonas aeruginosa than ciprofloxacin. This agent is an active L-isomer of ofloxacin. It is indicated for all urinary tract infections & for chronic bacterial prostatitis.

Trimethoprim-sulfamethoxazole (Bactrim, Bactrim DS, Septra, Septra DS): Trimethoprim-sulfamethoxazole (TMP-SMZ) is a combination antimicrobial agent designed to take advantage of synergy between TMP and sulfonamides. The antibacterial activity of TMP-SMZ includes common urinary tract pathogens, except Pseudomonas aeruginosa. SMZ inhibits dihydropteroate synthetase, preventing incorporation of para-aminobenzoic acid (PABA) into dihydrofolate and subsequent synthesis of tetrahydrofolate. This agent has broad bacteriostatic activity against aerobic gram-positive and gram-negative organisms, with little activity against anaerobes; unfortunately, SMZ does not penetrate well into the kidney, therefore may not be useful kidney infections.

Ampicillin (Omnipen, Polycillin, Principen): Ampicillin is an aminopenicillin beta lactam that impairs cell wall synthesis in actively dividing bacteria by binding to and inhibiting penicillin-binding proteins in the cell wall. This agent has enhanced activity against anaerobes and gram-negative aerobes and is generally used in combination with an aminoglycoside for empiric or directed activity against E faecalis urinary tract infections (UTIs).

Amoxicillin (Moxatag, Trimox): Amoxicillin is a penicillin antibiotic that interferes with the synthesis of cell wall mucopeptides during active multiplication, resulting in bactericidal activity against susceptible bacteria.

Gentamicin (Garamycin, Gentacidin): Gentamicin is a bactericidal aminoglycoside antibiotic that inhibits bacterial protein synthesis by binding to the ribosome. This agent has activity against a variety of aerobic gram-negative bacteria, as well as E faecalis and staphylococcal species, and it is used with or without ampicillin to treat acute prostatitis in the hospitalized patient when Enterococcus is a concern. The dosing regimens for gentamicin are numerous. Adjust the dose based on creatinine clearance (CrCl) and changes in the volume of distribution. Ideal body weight (IBW) should be used for calculations (the drug is not fat soluble). Once-daily dosing should only be used when treating gram-negative infections, as this takes advantage of its concentration-dependent killing and its post antibiotic effect.

Tobramycin (TOBI): Tobramycin is an aminoglycoside used for gram-negative bacterial coverage, with better pseudomonal coverage than gentamicin. This agent is commonly used in combination with agents against gram-positive organisms and those that cover anaerobes.

Consider using tobramycin when penicillin's or other less-toxic drugs are contraindicated, when bacterial susceptibility tests and clinical judgment indicate its use, and in mixed infections caused by susceptible strains of staphylococci and gram-negative organisms. Its dosing regimens are

numerous and are adjusted based on the CrCl and changes in the volume of distribution.

Ceftriaxone (Rocephin): Ceftriaxone is a third-generation cephalosporin that has a broad gram-negative spectrum, lower efficacy against gram-positive organisms, and higher efficacy against resistant organisms. By binding to 1 or more penicillin-binding proteins, this agent arrests bacterial cell wall synthesis and inhibits bacterial growth.

Vancomycin (Firvanq, Vancocin): Vancomycin is a potent antibiotic directed against gram-positive organisms and active against Enterococcus species. It is indicated for patients who cannot receive or have failed to respond to Penicillin's & cephalosporins or who have infections with resistant staphylococci. It is used in conjunction with gentamicin for prophylaxis in penicillin-allergic patients undergoing gastrointestinal or genitourinary procedures.

Ceftazidime (Fortaz, Tazicef): Ceftazidime is a third-generation cephalosporin and a bactericidal agent that exerts its effect by inhibiting the enzymes responsible for cell wall synthesis. This agent has nephrotoxicity following concomitant administration of cephalosporins with aminoglycoside antibiotics or potent diuretics such as furosemide.

Doxycycline (Vibramycin, Vibra-Tabs): Doxycycline is a broad-spectrum, bacteriostatic antibiotic in the tetracycline class. It inhibits protein synthesis and, thus, bacterial growth by binding to the 30S and, possibly, the 50S ribosomal subunits of susceptible bacteria.

Ertapenem (Invanz): Ertapenem has bactericidal activity from inhibition of cell wall synthesis, which is mediated through ertapenem binding to penicillin-binding proteins. This agent is stable against hydrolysis by a variety of beta lactamases, including penicillinases, cephalosporinases, and extended-spectrum beta lactamases.

Aztreonam (Azactam, Cayston): Aztreonam is a monobactam that inhibits cell wall synthesis during bacterial growth. It is active against gram-negative bacilli but has very limited gram-positive activity and is not useful against anaerobes. It lacks cross sensitivity with beta-lactam antibiotics, and it may be used in patients allergic to Penicillin's or cephalosporins.

Nitrofurantoin (Macrodantin, Furadantin): Nitrofurantoin is a bactericidal antibiotic indicated for acute cystitis and UTIs caused by E coli, enterococci, S aureus, & strains of Klebsiella and Enterobacter species.

Rifampin (Rifadin): Rifampin is an antituberculosis agent that inhibits RNA synthesis in bacteria by binding to the beta subunit of DNA-dependent RNA polymerase, to block RNA transcription.

Cefepime/enmetazobactam (Exblifep): Intravenous fourth generation cephalosporin plus beta-lactamase inhibitor, indicated for treatment of complicated urinary tract infections (cUTI), including pyelonephritis, caused by Escherichia coli, Klebsiella pneumoniae, Pseudomonas aeruginosa, Proteus mirabilis, and Enterobacter cloacae complex. 2. Managing Urge Incontinence: Bladder Training involves gradually increasing the time between trips to the bathroom, helping the bladder to hold more urine. Pelvic Floor Exercises Strengthening the pelvic floor muscles, improving bladder control and reduce leakage.

2. Lifestyle Modifications: Dietary Changes involve reducing or avoiding bladder irritants like caffeine, alcohol, and acidic foods to help minimize urge incontinence. Fluid Management through drinking an appropriate quantity of fluids, not too much or too little, is important. Losing weight, if overweight, can reduce pressure on the bladder and pelvic floor. Addressing constipation also helps with urge incontinence.

3.Other Medications: i) Anticholinergics & Beta-3 agonists help relax the bladder muscles, reducing urgency & frequency ii) Biofeedback technique helps individuals become aware of and control their pelvic floor muscles iii) Electrical Stimulation help strengthen pelvic floor muscles iv) Surgery may be considered, if other treatments are not effective.

4. Bladder Training: Here's a step-by-step bladder-training technique to be addvised:

Keep a diary: For a day or two, keep track of the times you urinate or leak urine during the day.

Calculate frequency: Average, number of hours between visits to the bathroom during the day?

Choose an interval: Based on your typical interval between needing to urinate, set your starting interval for training so that it's 15 minutes longer. So, if you usually make it for one hour before you need to use the bathroom, make your starting interval one hour and 15 minutes.

Hold back. On the day you start your training, empty your bladder first thing in the morning and don't go again until you reach your target time interval. If the time arrives before you feel the urge, go anyway. If the urge hits first, remind yourself that your bladder isn't full, and use whatever techniques you can to delay going. Try pelvic floor exercises (also called Kegels) or simply try to wait another five minutes before walking slowly to the bathroom.

Increase the interval. Once you are successful with your initial interval, increase it by another 15 minutes. Over several weeks or months, you may find you are able to wait much longer and that you feel the urge less often. After four to eight weeks, if you think you have found some improvement in your incontinence, do another diary. Compare your initial diary to your second diary to note the improvements in your intervals and the amount of urine you void. The act of reviewing and comparing helps reinforce the bladder training process.

Surgical Interventions:

Surgeries may be necessary for severe cases of BPH, prostate cancer, or when other treatments fail. Surgical options include procedures to relieve the blockage or implant devices to control leakage. **Prevention of UTIs:**

i. The primary way to prevent urinary tract infection is to pee when you need to & try to empty the bladder. Holding urine leads to bacteria build-up & irritation in urinary tract.
ii. Staying hydrated is a critical way to ensure frequent flushing of bacteria from the urinary tract. Drinking lots of fluids prevents constipation & other irritating kidney infection symptoms.
iii. Fiber-rich foods such as apples & cabbage are effective preventative measures for constipation. Staying hydrated by drinking water or tea & avoiding sugary or caffeinated beverages.
iv. Home remedies include using a heating pad on your belly, back, or side to soothe pains and aches from infections. Good hygiene contributes to preventing further infection.
v. Urinate soon after sex, and make sure you practice safe sex in general
vi. Contraceptive diaphragms prevent proper and complete emptying of the bladder; consider switching to different birth control methods
vii. Women with chronic UTI find it helpful to take preventive antibiotic therapy
viii. A significant infection will require one of the various available antibiotics. A significant change in usual urination pattern accompanied by any severe symptoms of an infection.

Conclusion:

However, Urge Urinary Incontinence (UUI) is a condition characterized by overwhelming sudden, urge to urinate, a common type of urinary incontinence across the world, sometimes referred to as an overactive bladder. This condition arises when the bladder muscles contract involuntarily, creating a strong & sudden need to urinate, even when the bladder isn't full.

A mild urinary tract infection (UTI) is the commonest cause temporary urinary incontinence, particularly in women. UTIs irritate the bladder &

urethra, causing them to become more sensitive & easily triggered, However, Empirical treatment of infection improves most cases of incontinent symptoms. Empiric antimicrobial therapy must be comprehensive and should cover all likely pathogens in the context of the clinical setting

More research is needed to investigate the specific risk factors for different types of UI in the Indian context. Studies are needed to understand the cultural and social factors that may contribute to the underreporting of: Urinary incontinence • Evaluating urinary incontinence, treating urinary incontinence • Coping with urinary incontinence • Fecal incontinence • Treating fecal incontinence • Coping with fecal incontinence

If experiencing urinary incontinence, it's crucial to consult with a primary healthcare professional, for proper diagnosis and treatment. Treatment options vary depending on the cause and severity, ranging from lifestyle changes and medications to surgery.

A urologist consultation may be needed to assess the underlying cause and recommend the most appropriate course of action if antibiotic therapy does not help.

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