

## ORIGINAL RESEARCH ARTICLE

# Urinary tract infection and its impact on sexual health

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### ABSTRACT

A sexual dysfunction and lower urinary tract symptoms have been a hot issue in recent years for scientists to study. There have been several clinical epidemiologic studies conducted in order to examine the connections between these two seemingly unrelated areas of urology research. In this review, an attempt is made to address these two sectors, their influence on patients' quality of life, shared pathophysiological processes, and therapeutic features. Many urological patients suffer from both conditions, which are widespread in the general community. Phosphodiesterase type 5 inhibitors, the generally accepted combo therapy in this situation, sparked interest in finding alternative therapeutic choices.

**Keywords:** urinary tract infection; sexual health; correlation; quality of life; therapeutic features

## 1. Introduction

Estimates from United States registries have found that UTIs equate to 0.7% (standard error 0.1%) of ambulatory care<sup>[1]</sup>. The main population of patients with UTIs are women<sup>[2,3]</sup>. Using the US registry data, it is calculated that each year 7 million women would be applying to ambulatory care because of simple UTIs<sup>[4]</sup>. In a survey, 10.8% of women had claimed to have a UTI over the preceding 12 months<sup>[5]</sup>. Most of the times, a UTI in males will be complicated by an underlying source of infection.

Having sex has more effects than only the possibility of becoming pregnant or contracting a sexually transmitted infections (STI). Some women may also get an infection of the urinary tract. Blame

it on female anatomy, which increases the likelihood of a UTI. Even yet, a UTI isn't always the result of a sex session. Infection can be minimized by taking basic measures. The urethra is the tube that carries urine from the bladder to the outside of the body for excretion. The shorter tube in women makes it simpler for germs to enter and spread throughout the bladder. Near the anus, germs that cause a UTI thrive. There is evidence to suggest that a woman's period can move microorganisms to her genital area. It's only a short distance up the urethra to the bladder, where it can proliferate and cause a urinary tract infection. Unsurprisingly, the frequency and quality of urination are two signs of a UTI. There are several symptoms associated with a UTI in women, including a strong desire to pee, blood-colored urine, and even pain or burning during the process. Even if you don't have a fever or chills, you may experience

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discomfort in your upper back, side or pelvic region as a result of an infection. It is unlikely that a UTI will occur every time a person engages in sexual activity. Having frequent UTIs, on the other hand, might give the impression that it is. Sex is clearly a factor in the onset of the disorder. “Honeymoon cystitis” is the name given to a urinary tract illness that affects newlyweds. A UTI, or urinary tract infection, is sometimes known as cystitis when it occurs as a result of frequent urination. Having a new partner, having a family history of them, living with diabetes or pelvic organ prolapse, transitioning to menopause (the increased dryness that results when oestrogen levels drop can increase your odds), or having difficulty fully emptying the bladder are all possible causes of recurrent UTIs, as is having difficulty urinating. UTIs are more common in males than in women, but they occur less frequently in men than in women<sup>[4,5]</sup>.

UTI not only a critical condition, its impact on sexual dysfunction is highly noted and review the same this review article discusses about the UTI, pathogenesis, the relationship between UTI and sexual dysfunction and medical and surgical therapy for UTI and sexual dysfunction were well discussed.

## **2. Urinary tract infection (UTI)**

UTI is a common complaint in adult men and women with a major impact on quality of life<sup>[6-9]</sup>. They can be divided into storage, voiding, and postmicturition symptoms<sup>[10]</sup>. UTI is strongly associated with ageing<sup>[6,7]</sup> and also with a number of modifiable risk factors, suggesting potential targets for prevention (e.g., metabolic syndrome)<sup>[11]</sup>. Most elderly men have encountered UTI<sup>[7]</sup>, which is often mild or not very bothersome<sup>[12,13]</sup>. UTI progression is a dynamic procedure. UTI may persist and upscale over long time periods, or they may retreat. UTI have usually been related to bladder outlet obstruction, which is often caused by an increase of prostatic volume, as a result of benign prostatic hyperplasia. On the contrary, numerous studies have shown that UTI are often not related to the benign prostatic hyperplasia<sup>[14]</sup>. Bladder dysfunction may

also cause UTI, such as detrusor overactivity or overactive bladder syndrome, detrusor underactivity, and structural or functional abnormalities of the urinary tract and its surrounding tissues<sup>[14]</sup>. Prostatitis may also cause the appearance of UTI<sup>[15,16]</sup>. Furthermore, there are some nonurological conditions that may be related to urinary symptoms, mainly to nocturia. The following is a list of the most prevalent conditions associated with UTI. Retention of Urine in the Acute Stage can be described as a painful and palpable bladder when the patient cannot pee. A non-painful bladder that remains palpable after a patient has urinated is classified as having chronic retention of urine. Incontinence may also be present.

Gram-negative and Gram-positive bacteria, as well as certain fungi, can cause urinary tract infections (UTIs). This bacterium is the most prevalent cause of both simple and complex urinary tract infections. *Klebsiella pneumoniae*, *Staphylococcus saprophyticus*, *Enterococcus faecalis*, group B streptococcus, *Proteus mirabilis*, *Pseudomonas aeruginosa*, *Staphylococcus aureus*, and *Candida* spp. are the next most common agents implicated in uncomplicated UTIs after Uropathogenic *Escherichia coli* (UPEC). Following UPEC as the most prevalent cause of complex UTIs, *Enterococcus* spp., *K. pneumoniae*, *Candida* spp., *S. aureus*, *P. mirabilis*, *P. aeruginosa*, and GBS are the next most common causative agents.

Reduced urine flow and increased detrusor pressure are the hallmarks of bladder outlet obstruction. The synchronous measurements of detrusor pressure and urine flow rate<sup>[5]</sup> can be used to diagnose it. Benign prostatic obstruction is a variant of benign outlet obstruction, and it is recognized when benign prostatic hyperplasia is the underlying cause of the blockage<sup>[5]</sup>. Detrusor overactivity is a condition in which the detrusor muscles spasm uncontrollably when the bladder is full<sup>[5]</sup>.

Urine urgency, with or without urinary incontinence, is one of the most common symptoms associated with the overactive bladder syndrome<sup>[17]</sup>. In this scenario, there is no established infection or

other evident pathology. The patient's medical history must be extensively analyzed. Comorbidities and their causes, such as medical and neurological conditions, are sought for in a medical history. It is also necessary to examine a person's diet, exercise, and medicine, as well as their feelings and thoughts. Sexual function should be tested as necessary, ideally using validated symptom questionnaires like the International Index for Erectile Function<sup>[18–20]</sup>. In the literature, a validated symptom score questionnaire is recommended for the assessment of male UTI. There are a number of surveys that can detect subtle changes in a patient's symptoms. They're useful for keeping track of therapy progress in this instance<sup>[21–27]</sup>. UTI may be quantified and the most common symptoms can be identified with the use of symptom ratings. Despite this, they are neither illness or age-related.

### 3. Sexual dysfunction

Because there isn't a consensus on what constitutes sexual dysfunction, it's impossible to gauge its frequency among males. The chronic inability to achieve and sustain an erection adequate to allow satisfactory sexual performance is characterized as erectile dysfunction<sup>[28]</sup>. Complex synchronization between the nervous, vascular, and smooth muscle compartments is required for penile erection. A combination of arterial dilatation, relaxation of trabecular smooth muscle, and activation of the corporal veno-occlusive mechanism<sup>[29]</sup> is required. Erectile dysfunction can have an impact on one's bodily as well as psychological well-being<sup>[30–32]</sup>. It has the potential to have a substantial influence on the quality of life of patients and their relationships. In light of the fact that erectile dysfunction can appear as an early indicator of coronary artery and peripheral vascular disease, it should not only be considered a quality of life concern but also as a warning sign of peripheral vascular disease<sup>[33–35]</sup>.

When it comes to the aetiology of erectile dysfunction, it is possible that it is vasculogenic or neurogenic, as well as anatomical or hormonal. Erectile dysfunction can be significantly impact-

ed by many pathophysiological pathways that are comorbid and concurrent. Erectile dysfunction is frequently the consequence of a combination of intrinsic pathophysiology and psychosocial factors. The aetiology of erectile dysfunction led to the early classification of three types. It is possible to have biological and psychogenic erectile dysfunction as well as a combination of the two. In the modern day, they are divided into two categories: the psychogenic and the mixed one, since each organic erectile dysfunction has an extra psychogenic impact that interferes with the pathophysiology of erectile dysfunction and adds additional discomfort to the patient<sup>[36,37]</sup>.

Worldwide, there is a significant incidence and prevalence of erectile dysfunction, according to epidemiological statistics. Noninstitutionalized males between the ages of 40 and 70 in the Boston region were found to have an overall incidence of 52% erectile dysfunction by the Massachusetts male ageing study. There was a 17.2, 25.2, and 9.6% prevalence for mild, severe, and full erectile dysfunction, respectively. Erectile dysfunction affected 19.2% of the men in the Cologne research<sup>[38]</sup> who were between the ages of 30 and 80. The long-term data from the Massachusetts male ageing study research<sup>[39]</sup> showed an incidence rate of erectile dysfunction of 26 (new cases per 1,000 males yearly) and a Dutch study found an incidence rate of 19.2 (mean follow-up of 4.2 years)<sup>[40]</sup>. The overall prevalence of erectile dysfunction of various degrees was 79.2% among the Turkish heterosexual men in a study<sup>[41]</sup>. Erectile dysfunction is common amongst Singaporean men. The prevalence and severity increased significantly with age after 50 years old according to a study<sup>[42]</sup>.

Obesity, diabetes, dyslipidemia, the metabolic syndrome, a lack of physical activity, and smoking are all risk factors for erectile dysfunction as well as cardiovascular disease<sup>[43–45]</sup>. There has been established a relationship between erectile dysfunction and a person's age; diabetes mellitus; Body mass index; obesity; and hyperhomocysteinemia<sup>[46–50]</sup>. Men with erectile dysfunction may benefit from

medication<sup>[51,52]</sup> and lifestyle adjustment<sup>[51]</sup> to reduce their risk of cardiovascular disease. It's been shown in epidemiological research that UTI and sexual dysfunction go hand in hand<sup>[53]</sup>, independent of age, other medical conditions, or behavior. More than 12,000 males between the ages of 50 and 80 years were studied in the MSAM-7 research, which was conducted in seven countries: France, Germany, Spain, Italy, Netherlands, and the United States. 83% of sexually active males were found to have UTI, with a frequency of 90%, while erectile dysfunction was found in 49%. About a tenth of the patients had no erection at all. In 46% of patients, ejaculatory abnormalities have been recorded<sup>[54]</sup>. Chronic prostatitis or chronic pelvic pain syndrome has been linked to erectile dysfunction<sup>[55]</sup>.

A man's erectile function might be affected by surgery on the prostate, depending on the procedure used<sup>[56]</sup>. Epidemiologically there are other risk factors that may be associated with the development of erectile dysfunction, such as the presence of psoriasis, gout, ankylosing spondylitis, nonalcoholic fatty liver, chronic periodontitis, open-angle glaucoma, inflammatory bowel disease, and complications following transrectal ultrasound guided prostate biopsy.

WHO and ICD-10 describe female sex dysfunction as "the different ways in which a woman is not able to participate in a sexual relationship as she would want"<sup>[57]</sup>. Sexual dysfunction in women may be divided into three types: female sexual interestarousal disorder, female orgasmic disorder, and genito-pelvic pain penetration disorder. Female sexual interestarousal dysfunction is estimated to affect 10% of women, and 3.5–35% have orgasmic difficulties<sup>[58]</sup>.

In addition to assessing erectile function, sexual desire, intercourse, orgasmic function, and overall satisfaction, psychometric questionnaires, such as the International Index for erectile Function<sup>[59]</sup> or the Sexual Health Inventory for Men<sup>[60]</sup>, are needed to assess the potential impact of a specific treatment modality. Studies show that the erectile hardness

score may accurately measure penile stiffness in clinical practice and clinical trials<sup>[61]</sup>. Screening for hypogonadism (testosterone deficiency) symptoms such as tiredness, cognitive impairment, and UTI is recommended. Screening for the severity of late-onset hypogonadism patients who have UTI is clinically important<sup>[62]</sup> since it is not an absolute contraindication to treatment.

## **4. The relationship between erectile dysfunction and UTI**

Many epidemiological studies show that erectile dysfunction and UTI coexist. The presence of UTI has been shown to be a risk factor for erectile dysfunction as well. Additionally, the patient's age and the severity of UTI are significant risk factors for erectile dysfunction. Although it is unclear if UTI causes erectile dysfunction or the erectile dysfunction causes UTI, or if both disorders just coexist, their connection is extremely limited and apparent, particularly in elderly people. To conclude, men who have UTI and men who have erectile dysfunction should be assessed for each other. UTI and erectile dysfunction are thought to be linked by four different ideas. Autonomic hyperactivity, NO/NOS system dysregulation, Rho-kinase activation, and chronic hypoxia are some of the explanations put forth. These ideas can be supported by common vascular risk factors<sup>[63,64]</sup>.

### **4.1. Alteration in nitric oxide**

Nitric oxide is well-known for its involvement in regulating penile smooth muscle relaxation and the subsequent erection that results. It is the endothelial dysfunction that causes a drop in NO/cyclic guanosine monophosphate (cGMP). When the smooth muscles of the bladder neck, prostate, and urethra relax too much or too little, it might cause UTI. When compared to healthy controls, the Nitric oxide system has been demonstrated to be down-regulated in the transition zone of the prostate in benign prostatic hyperplasia<sup>[65,66]</sup>.

## 4.2. Autonomic hyperactivity

Dysregulation of the sympathetic and parasympathetic nervous systems is a component of the metabolic syndrome. Due to vasoconstriction, increased sympathetic tone causes flaccidity and inhibits penile erection. Because the M2 receptors of the prostate smooth muscle are activated by parasympathetic activity, non-relaxation of the bladder neck, prostatic urethra, and pelvic floor may lead to urinary incontinence.

## 4.3. RhoA/rho-kinase-calcium-sensitizing pathway

In addition to the calcium-dependent method, the RhoA/ROCK calcium route is often used to regulate smooth muscle tone. Increases in erectile dysfunction and UTI have been observed following RhoA-ROCK pathway activation. Due to these pathological conditions, such as diabetes and involuntary bladder contractions, enhanced signalling of the muscarinic receptor-activated RhoA/ROCK pathway was related with increased penile RhoA/ROCK. In the corpora cavernosa and bladder of spontaneously hypertensive rats, a genetically susceptible rat strain, an increase in RhoA/ROCK was seen. ROCK inhibition has a significant impact on bladder hyperactivity and urinary tract contractions in patients with Spontaneously hypertensive rats<sup>[65,66]</sup>.

## 4.4. Pelvic atherosclerosis

Erectile dysfunction and UTI are linked by atherosclerosis of the bladder, penis, and prostate. According to this notion, risk factors for erectile dysfunction (such as smoking, high blood pressure, high cholesterol, and diabetes) also have an impact on UTI. Men and women with two risk factors for atherosclerosis (diabetes, hypertension, hyperlipidemia, and nicotine use) had a significantly higher International Prostate Symptom Score than those with one or no risk factors at all, according to an epidemiologic research. Animal models of hypercholesterolemia and pelvic ischemia show comparable alterations in the smooth muscle of the

prostate, bladder, and penis. It has been proposed that hypoxia induces the overexpression of TGF $\beta$ 1 and the creation of converted prostanoid is one of the ways. In the same way, penile ischemia results in the loss of smooth muscle and, ultimately, erectile dysfunction. There may be a reduction in UTI symptoms if the bladder's smooth muscle is damaged. The loss of bladder smooth muscle due to ischemia from bladderoutlet obstruction or pelvic vascular disease would result in the replacement of collagen deposition and fibrosis, as well as a lack of compliance, overactivity, and reduced contractility in the urinary tract. Lower urine flow, higher flow resistance, and worsening UTI can all be caused by the loss of smooth muscle in the prostate. It has been shown that Rk activity increases and NOS expression decreases in patients with metabolic syndrome/Autonomic hyperactivity which is accompanied by pelvic ischemia/atherosclerosis<sup>[65,66]</sup>.

## 5. Multifactorial interaction between UTI and erectile dysfunction

When a patient, caregiver, or partner notices a change in UTI, it may prompt him or her to seek expert assistance. The 6th International Consultation on Incontinence 2016 found that 46% of persons over the age of 20 had UTI, 11.8% have overactive bladder syndrome, 8% have some sort of urine incontinence, and 4% have severe stress urinary incontinence. Increased sadness, lower job productivity, and decreased sexual satisfaction are all linked to urinary incontinence<sup>[67]</sup>.

A successful and healthy existence is dependent on a variety of factors, not the least of which is the quality of one's sexual life, behaviour, and relationships. The absence of illness, sickness, or dysfunction isn't all that's required for a healthy sex life. Sex practices and habits have evolved significantly over time, yet it is also well known that sexual frequency and other activities decline with age. Anal sex, on the other hand, is becoming increasingly prevalent these days. Education, rather than economic position, is more likely to explain these changes<sup>[67]</sup>.

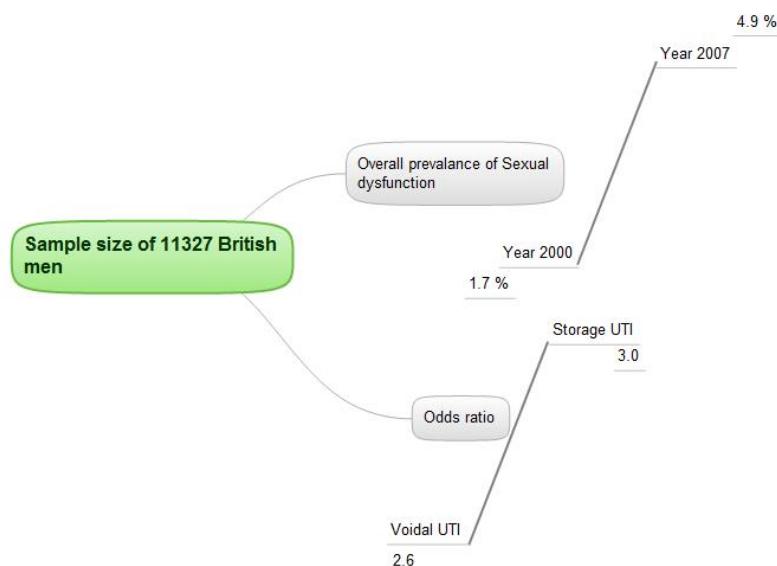
The neural network of the pelvis, which encompasses the bladder, bowel, and sexual functions, has a direct connection to the pelvic organ functions from a physiological perspective. In addition, the functioning of the pelvic organs is affected by a wide range of vascular, hormonal, cellular, and other variables. Pathophysiological mechanisms between erectile dysfunction and UTI in males have been identified.

## 6. Effects of UTI/incontinence on male sexual function: Epidemiological data

Many significant investigations conducted in the previous few years have demonstrated the occurrence of Sexual dysfunction and UTI in males. According to the Health Improvement Network database, from a sample of 11,327 British men, the overall prevalence of Sexual dysfunction increased from 1.7% in 2000 to 4.9% in 2007. There was an odds ratio of 3.0 (2.6–3.4) for erectile dysfunction in storage UTI, 2.6 (2.4–2.7) for voiding UTI, and a combined odds ratio of 4.0 (3.4–4.8) for both void-

ing and storage UTI, respectively. According to the EpiLUTS research (an international cross-sectional, population-representative survey of 6,326 males), overactive bladder syndrome has an effect on sexual health. Poor sexual health, less pleasure in sex, and lower levels of sexual engagement were all linked to overactive bladder syndrome, whether it was wet or dry. Men's erectile dysfunction and ejaculatory dysfunction were strongly predicted by the dry/wet state of the overactive bladder syndrome. Studies by Rosen et al. show that older men who have UTI have an increased chance of developing sexual dysfunction<sup>[67]</sup>. The overall prevalence of sexual dysfunction in a study of 11,327 British men studied is presented in **Figure 1**.

In elderly men, UTI are prevalent. Despite the fact that UTI are caused by a variety of tors, bladder outlet obstruction/benign prostatic hyperplasia has long been regarded one of the most frequent. In addition to affecting sexual function, these symptoms can also have an effect on quality of life and include dribbling and urgency with leakage, nocturia, and trouble urinating.



**Figure 1.** Representation of overall prevalence of sexual dysfunction among the 11,327 British men participated in a study.

## 7. Medical and surgical therapy for UTI and its impact on sexual function

All current therapies for UTI have been thoroughly evaluated. Whether or not, they have any detrimental effects on erectile function is still being researched. There appears to be little or no effect on sexual function and much less efficacy in the treat-

ment of UTI with behavioural therapy and phytotherapy. Prostatic surgery,  $\alpha$ -blockers, and 5- $\beta$  reductase inhibitors all relieve UTI symptoms, however they have a deleterious influence on sexual performance. Phosphodiesterase type 5 inhibitors have been shown to be effective in treating UTI in men with or without erectile dysfunction in several clinical studies<sup>[69]</sup>.

Contrary to popular belief, the effects on sexual function of many commonly prescribed  $\alpha$ -blockers (doxazosin, tamsulosin, and silodosin) are not always the same. Erectile function appears to be modestly improved by them. As a result, orgasmic function may be impaired and ejaculation might be negatively affected<sup>[70]</sup>. The anomalous ejaculate was initially assumed to be retrograde. However, a reduction or lack of seminal fluid, maybe as a result of a central impact, appears to be the most plausible cause. Inhibiting the contraction of the seminal vesicles is one of the primary actions of  $\alpha$ -blockers on the sympathetic nervous system.

Men with UTI who have a prostate that is assessed to be greater than 40 mL and who are deemed to be at high risk of progression are frequently administered 5 $\alpha$ -Reductase inhibitors<sup>[71-73]</sup>. 5 $\alpha$ -Reductase inhibitors have a larger influence on sexual function than  $\alpha$ -blockers. Reduced libido, erectile dysfunction, and ejaculatory problems such dry orgasm, ejaculatory failure, or decreased semen volume are the most commonly reported adverse effects<sup>[74-76]</sup>. The impact of 5 $\alpha$ -Reductase inhibitors on ejaculatory function is still understudied, as should be noted.

Both transurethral resection of the prostate and transurethral incision of the prostate are considered the best surgical treatments for treating benign prostate hyperplasia and bladder outlet obstruction. Dry orgasm rates following these procedures range from 30.4% to 96.9% and from 6.1 to 55.1%, respectively. Only a few research<sup>[77-79]</sup> investigated these rates in a prospective manner, resulting in a wide range of results. After transurethral resection of the prostate, erectile dysfunction rates have ranged

from 3.4% to 32.4%<sup>[78,79]</sup>.

As well as GreenLight photoselective vaporisation of the prostate and holmium laser enucleation of the prostate, laser techniques for bladder outlet obstruction/benign prostate hyperplasia such as these are commonly available. According to preliminary findings, GreenLight has a similar effect on sexual function as transurethral resection of the prostate. There was no difference in retrograde ejaculation rates between these two prostatic surgical procedures in a single trial<sup>[80]</sup>. In terms of erectile function, Transurethral resection of the prostate and photoselective vaporization of the prostate are indistinguishable<sup>[81,82]</sup>. The outcomes of holmium laser enucleation of the prostate appear to be comparable. Holmium laser enucleation of the prostate and transurethral resection of the prostate had similar rates of retrograde ejaculation and erectile dysfunction<sup>[83,84]</sup>. Approximately 75% of individuals who are sexually active experience retrograde ejaculation following holmium laser enucleation of the prostate, according to one study. There are two surgical groups now working on ejaculation preservation techniques. One is GreenLight and the other is holmium laser enucleation of the prostate.

If you compare transurethral needle ablation with transurethral resection of the prostate, it appears to have lower incidence of retrograde ejaculation. There have been no documented incidences of retrograde ejaculation in the transurethral needle ablation cohort, compared to the 45% in the transurethral resection of the prostate arm, in a few investigations<sup>[85-87]</sup>. In terms of sexual function, an alternative procedure known as urolift/prostatic urethral lift has been successful<sup>[88]</sup>.

Since life expectancy has increased, many individuals with UTI want to maintain or improve their sex lives as a result of therapy. Patients' preferences and expectations may be overlooked when doctors focus solely on the symptoms. A lot of patients still complain about their quality of life despite effective therapy owing to side effects from the operation or medication. Pharmacological treatment to UTI and

its impact on sexual function is presented in **Table 1**.

**Table 1.** Pharmacological treatment to UTI and its impact on sexual functions

Medical & Surgical therapy for UTI	Impact on sexual function
Prostatic surgery	Erectile dysfunction, dry orgasm
$\alpha$ -blockers	Orgasam impaired, ejaculation negatively affected
5- $\beta$ reductase inhibitors	Reduced libido, erectile dysfunction, and ejaculatory problems

## 8. Medical therapy for erectile dysfunction and its impact on UTI

It is found in the urethra, prostate, and bladder that Phosphodiesterase-5 is expressed throughout the lower urinary system. Phosphodiesterase-5 can affect any of these organs<sup>[89–92]</sup>. PDE5-I appears to effect on smooth muscle contraction and blood flow since it is highly concentrated in the stroma and vascular bed (endothelial and smooth muscle cells).

As of 2007, for the first time, McVary et al.<sup>[93]</sup> examined the safety and efficacy of the drug, Tadalafil, for the treatment of UTI. There was a total of 479 screenings. Randomly, 281 patients were randomized to either a 6-week course of once-daily placebo or 5 mg of the active ingredient tadalafil. A total of 12 weeks of once-day placebo therapy was given to the remaining 261 participants, after which the tadalafil dose was escalated to 20 mg once daily for the remaining 261 patients. There were no cases of erectile dysfunction in any of the 143 men who received the placebo; 84 men (59%), on the other hand, had erectile dysfunction but were still sexually active; and 76 men (53%) were still sexually active despite having erectile dysfunction. Contrarily, in the study of 138 males using tadalafil dosages ranging from 5 to 20 mg, 107 (77.5%) reported being sexually active, 99 (71.7%) reported having normal sexual function, and 80 (58.0%) reported being sexually active in spite of having erectile dysfunction. UTI was assessed using the International Prostate Symptom Score (which included the IPSS-Quality of life question) and the BII questionnaires. Ultrasound was used to determine the amount of post-void residual urine and to record the

maximum and average urinary flow rates ( $Q_{max}$  and  $Q_{ave}$ ) during free uroflowmetry. International Index of Erectile Function items 1–5 and 15 were used to measure the sexual function of the male subjects in the study.

Since 2007, multiple studies have demonstrated the safety and efficacy of phosphodiesterase-5 inhibitors as a medical treatment for both UTI and erectile dysfunction. Male patients with obstructive sleep apnoea syndrome were evaluated for their UTI, nocturia, sexual dysfunction, and quality of life status. It is one of the most successful therapies for quality of life status, giving positive air pressure to expand the respiratory tract and maintain high oxygen saturation in the bloodstream. Benign Prostatic Hyperplasia Impact Index, as well as changes in nocturia frequency and night-time urine volume, were all examined and the changes were reported. Significant modifications and improvements in symptoms and quality of life were found after continuous positive airway pressure therapy. In individuals with obstructive sleep apnea syndrome, continuous positive airway pressure therapy has been demonstrated to reduce the incidence of nocturia and enhance erectile function and quality of life<sup>[94,95]</sup>. Recent days, Oral medications are a successful erectile dysfunction treatment for many men. They include Sildenafil (Viagra), Tadalafil (Adcirca, Cialis), Vardenafil (Levitra, Staxyn) and Avanafil (Stendra). Apart from oral medications, Alprostadil self-injection and Alprostadil urethral suppository are available to produced better results. Testosterone replacement therapy too gains a better efficacy. If medications aren't effective or appropriate, other recommended treatments include Penis pumps, surgery and implants. Recent studies have found that exercise, especially moderate to vigorous aerobic activity, can improve erectile dysfunction.

## 9. Conclusions

Both Sexual dysfunction and UTI appear to share a significant relationship. A shared pathophysiological pathway appears to link these two serious consequences, which affect a large number



of urology patients. Patients with either condition. Treatment for erectile dysfunction and UTI in men has reached a significant milestone with the introduction of phosphodiesterase-5 inhibitors. There's no doubt about their safety and efficacy. Young therapies may be employed in the near future as an alternative to what is now being studied for UTI and Sexual dysfunction, which is still a relatively new field of study.

## Conflict of interest

The authors declare no conflict of interest.

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