

Urinary disease and treatment condition in Bangladesh

Pharmaceutical Research

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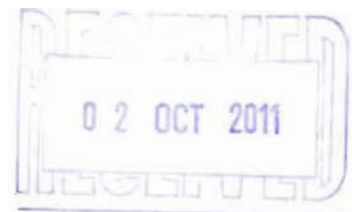
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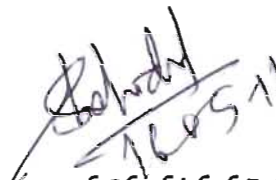


East West University



CERTIFICATE

This is to certify that, the "urinary disease and treatment condition in Bangladesh" submitted to the department of pharmacy East -West University, Mohakhali, Dhaka for the partial fulfillment of the requirements for the degree of Bachelor of Pharmacy (B. Pharm) was carried out by Md. Mahbubur Rahaman (ID# 2006-1-70-034) under our Guidance and supervision and that no part of the thesis has been submitted for any other degree. We further certify that the sources of information and laboratory facilities availed of this connection is duly acknowledged.


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Sufia Islam

30.06.2011

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Abstract

Urinary system is one of the important part of our body. It is the major organ for waste material elimination from the body, this system started from the kidney and end to the urethral duct that exposed to the external environment. Any dysfunction of this system is urinary disease. In Bangladesh the severity of this disease is high. Problems in the urinary system can be caused by aging, illness, or injury. As the person get older, changes in the kidneys' structure cause them to lose some of their ability to remove wastes from the blood. Illness or injury can also prevent the kidneys from filtering the blood completely or block the passage of urine. Benign prostatic hyperplasia (BPH) is a condition in men that affects the prostate gland. BPH is an enlargement of the prostate gland that can interfere with urinary function in older men. It causes blockage by squeezing the urethra, which can make it difficult to urinate. Most men over age 60 have some BPH, but not all have problems with blockage. Interstitial cystitis (PBS/IC) is a chronic bladder disorder also known as frequency-urgency-dysuria syndrome. In this disorder, the bladder wall can become inflamed and irritated. The inflammation can lead to scarring and stiffening of the bladder, decreased bladder capacity, pinpoint bleeding, and, in rare cases, ulcers in the bladder lining. Kidney stones is the term commonly used to refer to stones, or calculi, in the urinary system. Stones form in the kidneys and may be found anywhere in the urinary system. They vary in size. Some stones cause great pain while others cause very little. The aim of treatment is to remove the stones, prevent infection, and prevent recurrence. Both nonsurgical and surgical treatments are used. Kidney stones affect men more often than women. Prostatitis is inflammation of the prostate gland that results in urinary frequency and urgency, burning or painful urination, a condition called dysuria, and pain in the lower back and genital area, among other symptoms. In some cases, prostatitis is caused by bacterial infection and can be treated with antibiotics. Proteinuria is the presence of abnormal amounts of protein in the urine. Healthy kidneys take wastes out of the blood but leave in protein. Protein in the urine does not cause a problem by itself. But it may be a sign that your kidneys are not working properly. Urinary tract infections (UTIs) are caused by bacteria in the urinary tract. Women get UTIs more often than men. UTIs are treated with antibiotics. Drinking lots of fluids also helps by flushing out the bacteria. The name of the UTI depends on its location in the urinary

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tract. An infection in the bladder is called cystitis. If the infection is in one or both of the kidneys, the infection is called pyelonephritis. Urinary incontinence, loss of bladder control, is the involuntary passage of urine. There are many causes and types of incontinence, and many treatment options. Treatments range from simple exercises to surgery. Women are affected by urinary incontinence more often than men. Urinary retention, or bladder-emptying problems. Normally, urination can be initiated voluntarily and the bladder empties completely. Urinary retention is the abnormal holding of urine in the bladder, causing pain and discomfort. Causes can include an obstruction in the urinary system, stress, or neurologic problems. This study was accomplished among the 77 patients of urology department of five different hospital in Dhaka city. It was found that the most common type of urinary disease is the urinary tract obstruction that occurs due to the mass formation in the urinary tract. About 29% of patients are suffering from this form of disease. Along with the urinary problem the patients are also some associated problem such as asthma, cough, diabetes etc. As a treatment of the urinary disease antibiotic drug such as cephalosporin, fluoroquinolone, penicillin are used. But all of the disease can not be cured by the drug, in that case surgery is essential.

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This thesis paper is dedicated to my Parents



Chapter 1

Introduction

1.0 Urinary Tract

The urinary tract consists of the organs, tubes, and muscles that work together to make, move, store, and release urine. The upper urinary tract includes the kidneys, which filter wastes and extra fluid from the blood, and the ureters, which carry urine from the kidneys to the bladder. The lower urinary tract includes the bladder, a balloon-shaped muscle that stores urine, and the urethra, a tube that carries urine from the bladder to the outside of the body during urination. If the urinary system is healthy, the bladder can hold up to 16 ounces—2 cups—of urine comfortably for 2 to 5 hours.

Muscles called sphincters squeeze shut the tubes from the bladder to help keep urine from leaking. The sphincter muscles close tightly like a rubber band around the opening of the bladder, which leads into the urethra. Nerves in the bladder tell, when it is time to urinate. As the bladder first fills with urine, it may notice a feeling that you need to go. 1. As it reaches its limit, nerves from the bladder send a message to the brain that the bladder is full and the urge to empty the bladder intensifies. When the person urinates, the brain signals the bladder muscle to tighten, squeezing urine out of the bladder.

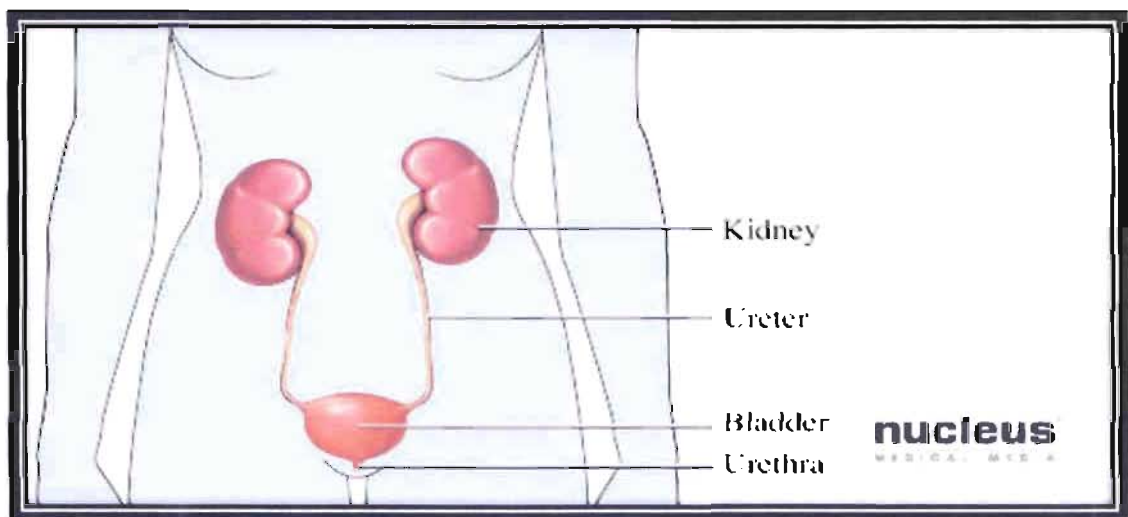


Figure 01: Urinary tracts.

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1.2.0 Different Types of Urinary Disease

URINARY DISEASE						
URINARY TRACT INFECTION	BLADDER CANCER	INTERSTITIAL CYSTITIS	BENIGN PROSTATIC HYPERPLASIA	PROSTATE CANCER	URINARY INCONTINANCE	NEUROGENIC BLADDER

1.2.1 Urinary Tract Infection

UTIs may be referred to as cystitis or pyelonephritis, terms that refer to the lower and upper urinary tract, respectively. The terms bacteriuria and candiduria describe bacteria or yeast in the urine. Very ill patients may be referred to as having urosepsis.

Complicated UTIs are defined as UTIs that are associated with metabolic disorders, that occur at sites other than the urinary bladder, or that are secondary to anatomic or functional abnormalities that impair urinary tract drainage. Most complicated UTIs are nosocomial in origin. The most common pathogens include *Escherichia coli*, enterococci, *Pseudomonas aeruginosa*, candidal species, and *Klebsiella pneumoniae*. Complicated UTIs may be subdivided into the following 4 categories:

Serial No	Subdivision of UTI	Causes of UTI
I	Structural abnormalities	Calculi, infected cysts, renal/bladder abscesses, certain forms of pyelonephritis, spinal cord injury (SCI), catheters
II	Metabolic/hormonal abnormalities	Diabetes, pregnancy
III	Impaired host responses	Transplant recipients, patients with AIDS
IV	Unusual pathogens	Yeast, etc

Table01 : Classification of Urinary tract infection

1.2.1a.Pathophysiology

In general, 3 main mechanisms are responsible for UTIs, including (1) colonization with ascending spread, (2) hematogenous spread, and (3) periurogenital spread of infection. Specific organism characteristics, defects in host defenses, and pathophysiologic details concerning particular UTIs are discussed below.

1.2.1b.Bacterial virulence

Uropathogenic bacteria, derived from a subset of fecal flora, have traits that enable adherence, growth, and resistance of host defenses, resulting in colonization and infection of the urinary tract.

Other factors that may be important for *E coli* virulence in the urinary tract include capsular polysaccharides, hemolysins, cytotoxic necrotizing factor (CNF) protein, and aerobactins. Several Kauffman serogroups of *E coli* may be more likely to cause UTIs, including O1, O2, O4, O6, O16, and O18.

1.2.1c.Host resistance

Most uropathogens gain access to the urinary tract via an ascending route. The shorter length of the female urethra allows uropathogens easier access to the bladder. The continuous unidirectional flow of urine helps to minimize UTIs, and anything that interferes with this increases the host's susceptibility to UTI. Examples of interference include volume depletion, sexual intercourse, urinary tract obstruction, instrumentation, use of catheters not drained to gravity, and vesicoureteral reflux.

1.2.1d.Pathophysiologic details of complicated urinary tract infections

Pyelonephritis is almost always the result of bacteria migrating from the bladder to the renal parenchyma, which is enhanced by vesicourethral reflux. In uncomplicated pyelonephritis, the bacterial invasion and renal damage are limited to the pyelocalyceal-medullary region; in complicated pyelonephritis, all regions of the kidney may be affected. If the infection progresses, bacteria may invade the bloodstream, resulting in bacteremia.

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Complicated pyelonephritis results from structural and functional abnormalities, urologic manipulations, or underlying disease. Complicated pyelonephritis includes pyelonephritis in men and pyelonephritis elderly people. Patients with diabetes may develop emphysematous or xanthogranulomatous pyelonephritis and necrotizing papillitis.

Subclinical pyelonephritis should be considered in indigent people; pregnant women; people with diabetes; people with alcoholism; and patients with a history of pyelonephritis, renal transplant, UTI before age 12 years, and more than 3 UTIs in the past year.

Calculi related to UTIs, as in the image below, most commonly occur in women with recurrent UTIs from *Proteus*, *Pseudomonas*, and *Providencia* species; bacterial biofilms serve to assist struvite growth. Because magnesium ammonium phosphate is acid soluble, stone formation does not tend to occur with a urinary pH lower than 7.19. Increases in ammonia raise the pH and injure the uroepithelial glycosaminoglycan layer, contributing to bacterial adherence. Alkalinity also increases the amount of phosphate and carbonate available to bind calcium and magnesium.

Renal corticomedullary abscesses usually are associated with vesicoureteral reflux or urinary tract obstruction, and the usual organisms include *E coli*, *Klebsiella* species, and *Proteus* species. Clinical syndromes include acute focal bacterial nephritis, acute multifocal bacterial nephritis, emphysematous pyelonephritis, and xanthogranulomatous pyelonephritis.

1.2.1d. Sex

Uncomplicated UTIs are much more common among women than men when matched for age. A study of Norwegian men aged 21-50 years showed an approximate incidence of 0.0006-0.0008 infections per person-year, compared with approximately 0.5-0.7 per person-year in similarly aged women in the United States.

- Renal carbuncles are more common in men than women by a ratio of 3:1 and are most common in the second to fourth decades of life. The right kidney is involved most commonly (63%).
- Renal corticomedullary abscesses affect men and women equally; xanthogranulomatous pyelonephritis affects more women than men.

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1.2.1e.Age

The incidence of UTI in women tends to increase with increasing age. Several peaks above baseline correspond with specific events, including an increase among women aged 18-30 years (associated with honeymoon cystitis and pregnancy). Older adults have a higher incidence of renal corticomedullary abscesses. This article does not discuss UTIs in children.

1.2.1f.Causes

E coli causes 70-95% of both upper and lower UTIs. The remainder of infections is composed of various organisms, including *S saprophyticus*, *Proteus* species, *Klebsiella* species, *Enterococcus faecalis*, other Enterobacteriaceae, and yeast. Some species are more common in certain subgroups, such as *S saprophyticus* in young women.

- Sexual intercourse contributes to increased risk, as does use of a diaphragm and/or spermicide. Women who are elderly, pregnant, or have preexisting urinary tract structural abnormalities or obstruction carry a higher risk of UTI.
- Most complicated UTIs are nosocomial in origin. The most common pathogens include *E coli*, enterococci, *P aeruginosa*, *Candida* species, and *K pneumoniae*.
- Calculi related to UTIs most commonly occur in women who experience recurrent UTIs with *Proteus*, *Pseudomonas*, and *Providencia* species.
- Perinephric abscesses are associated most commonly with *E coli*, *Proteus* species, and *S aureus* but also may be secondary to *Enterobacter*, *Citrobacter*, *Serratia*, *Pseudomonas*, and *Klebsiella* species. More unusual causes include enterococci, *Candida* species, anaerobes, *Actinomyces* species, and *Mycobacterium tuberculosis*. Twenty-five percent of infections are polymicrobial.
- Candiduria is defined as more than 1,000 CFU of yeast from 2 cultures. *Candida albicans*, which is germ tube positive, is the usual culprit. Germ tube-negative *Candida* species (*tropicalis*, *parapsilosis*, *glabrata*, *lusitaniae*, *krusei*) are less common.
- Patients with SCI develop UTIs with microorganisms that form dense biofilms on the bladder wall; thus, these infections are difficult to eradicate. Organisms that commonly cause

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infections include *Proteus*, *Pseudomonas*, *Klebsiella*, *Serratia*, and *Providencia* species, along with enterococci and staphylococci. Acute Cystitis

1.2.1g. Medication

The goals of pharmacotherapy are to eradicate the infection, reduce morbidity, and prevent complications.

1.2.1h. Antibiotics

Empiric antimicrobial therapy should cover all likely pathogens in the context of this clinical setting. The prolonged or repeated use of antibiotics may result in fungal or bacterial overgrowth of nonsusceptible organisms, superinfections, or infections with *Clostridium difficile*.

Antibiotics sometimes are used in combination. Sometimes these combinations work against each other (ie, are antagonistic); examples would include beta-lactams (such as penicillin) and tetracyclines. Antagonism is defined as at least a 99% decrease in killing by the combination (when compared with the most active antimicrobial alone).

Synergism is when a combination of antibiotics has a significantly greater effect than would be expected from the sum of the separate drugs (ie, over a 99% increase in killing). Aminoglycosides and either beta-lactams or vancomycin are considered synergistic combinations. Because no single drug is considered bactericidal for enterococci, some might prefer to use synergistic combinations when treating enterococcal urinary tract infections (UTIs).

The techniques used to generate data regarding synergy and antagonism are laborious and should generally be performed only in a research laboratory.

i) Trimethoprim (Proloprim, Trimplex)

Inhibits bacterial growth by inhibiting synthesis of dihydrofolic acid. Active in vitro against a broad range of gram-positive and gram-negative bacteria, including uropathogens, such as Enterobacteriaceae and *S saprophyticus*.

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Dosing

Adult	Pediatric
100-200 mg PO q12h	Not established

II. Trimethoprim-sulfamethoxazole (Bactrim, Bactrim DS, Septra, Septra DS, Cotrim)

TMP-SMZ has been given an "A, I" rating in the 1999 IDSA guidelines for treating UTIs. Combination antimicrobial designed to take advantage of the synergy between TMP and sulfonamides. Inhibits dihydropteroate synthetase, preventing the incorporation of para-aminobenzoic acid (PABA) into dihydrofolate and subsequent synthesis of tetrahydrofolate. TMP-SMZ activity includes common urinary tract pathogens, both aerobic gram-positive and gram-negative bacteria, except *P aeruginosa*.

- Dosing

Adult	Pediatric
160 mg TMP/800mg SMZ PO	8-12 mg/kg TMP component PO divided

III. Ampicillin (Omnipen, Principen, Totacillin, Polycillin)

Impairs cell wall synthesis in actively dividing bacteria; binds to and inhibits penicillin-binding proteins (PBPs). Activity against anaerobes and gram-negative aerobes. Generally used in combination with an aminoglycoside for empiric or directed activity against *E faecalis*.

Beta-lactams, in general, have been given an "E, I" rating in the 1999 IDSA guidelines for treating UTIs. Beta-lactams are less effective because they are excreted rapidly in the urine and do little to alter the GI/GU reservoir of bacteria.

- Dosing

Adult	Pediatric
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Ampicillin trihydrate: 500 mg PO q6h	<28 days: Not recommended
Ampicillin: 150-200 mg/kg IV divided q4-6h	>28 days: 50 mg/kg PO/IV q6h

IV. Amoxicillin (Trimox, Amoxil, Biomox)

Interferes with synthesis of cell wall mucopeptides during active multiplication, resulting in bactericidal activity against susceptible bacteria.

- **Dosing**

Adult	Pediatric
250-500 mg PO q8h; not to exceed 3 g/d	20-50 mg/kg/d PO divided q8

V. Gentamicin (Garamycin, Gentacidin)

Bactericidal aminoglycoside antibiotic that inhibits bacterial protein synthesis. Activity against various aerobic gram-negative bacteria, as well as *E. faecalis* and staphylococcal species. Most commonly used with or without ampicillin to treat acute pyelonephritis in the hospitalized patient when *Enterococcus* species are a concern. Only aminoglycoside with appreciable activity against gram-positive organisms.

- **Dosing**

Adult	Pediatric
3-5 mg/kg IV qd	<28 days: Not recommended
1 mg/kg IV q8h	>28 days: 2.5 mg/kg IV q8h

VI. Cefixime (Suprax)s

Third-generation oral cephalosporin with broad activity against gram-negative bacteria, including Enterobacteriaceae, by inhibiting cell wall synthesis. Has shown poor activity against staphylococcal and enterococcal species. Cefixime compared favorably to a quinolone in one study.

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- **Dosing**

Adult	Pediatric
400 mg PO qd	8 mg/kg PO qd

VII. Cefpodoxime proxetil (Vantin)

Extended-spectrum oral cephalosporin with bactericidal activity against gram-positive and gram-negative bacteria, including *S aureus* (not MRSA) and *S saprophyticus*. Active agent in vivo is cefpodoxime. Beta-lactams, in general, have been given an "E, I" rating in the 1999 IDSA guidelines for treating UTIs.

- **Dosing**

Adult	Pediatric
Acute cystitis: 100 mg PO q12h	10 mg/kg PO divided bid
Acute pyelonephritis: 200 mg PO q12h	not to exceed 400 mg/d

VIII. Ciprofloxacin (Cipro)

Quinolone. Antimicrobial activity based on ability to inhibit bacterial DNA gyrase and topoisomerases, which are required for replication, transcription, and translation of genetic material. Quinolones have broad activity against gram-positive and gram-negative aerobic organisms. Differences in chemical structure between quinolones have resulted in altered levels of activity against different bacteria. Ciprofloxacin has greatest antimicrobial activity against *P aeruginosa*. Altered chemistry structures result in toxicity differences as well. Quinolones have been given an "A, I" or "A, II" rating in the 1999 IDSA guidelines for treating UTIs.

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• Dosing

Adult	Pediatric
500-750 mg PO bid	<18 years: Not recommended

IX. Levofloxacin (Levaquin)

Quinolone. Antimicrobial activity based on ability to inhibit bacterial DNA gyrase and topoisomerases, which are required for replication, transcription, and translation of genetic material. Quinolones have broad activity against gram-positive and gram-negative aerobic organisms. Differences in chemical structure between quinolones have resulted in altered levels of activity against different bacteria. Altered chemical structure results in toxicity differences as well. Quinolones have been given an "A, I" or "A, II" rating in the 1999 IDSA guidelines for treating UTIs.

• Dosing

Adult	Pediatric
250-500 mg PO/IV qd	<18 years: Not recommended >18 years: Administer as in adults

1.2.2 Bladder Cancer

Bladder cancer occurs when there are abnormal, cancerous cells growing in the bladder. Bladder cancer affects men four times more often than women, and it occurs in Caucasians twice as often as in African Americans. The risk of bladder cancer increases with age - over 70 percent of people who are diagnosed with it are older than 65.



BLADDER CANCER STAGING (TNM)

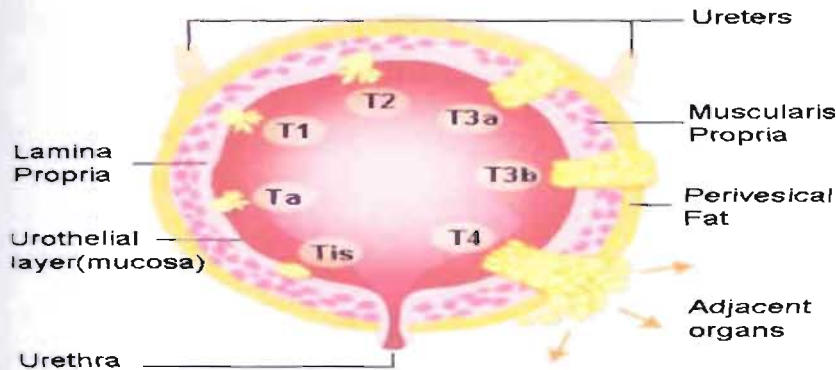


Figure03:Bladder cancer staging

The bladder is a triangle-shaped, hollow organ located in the lower abdomen. It is held in place by ligaments that are attached to other organs and the pelvic bones. The bladder's walls relax and expand to store urine, and contract and flatten to empty urine through the urethra. The typical healthy adult bladder can store up to two cups of urine for two to five hours.

1.2.2a.Different types of bladder cancer

There are several types of bladder cancers, including the following:

➤ **Transitional cell (urothelial) carcinoma**

Transitional cell carcinoma is cancer that begins in the cells lining the bladder. Transitional cells also line the other parts of the urinary tract including the kidneys, ureters, and urethra. Transitional cell carcinoma is the most common kind of bladder cancer, occurring in about 90 percent of cases.

➤ **Squamous cell carcinoma**

Squamous cell carcinoma is cancer that begins in squamous cells - thin, flat cells found in the tissue that forms the surface of the skin, the lining of the hollow organs of the body, and the passages of the respiratory and digestive tracts. About 4 percent of bladder cancers are squamous cell carcinomas.

➤ **Adenocarcinoma**

Adenocarcinoma is cancer that begins in the cells of glandular structures lining certain

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organs in the body and then spreads to the bladder. Common primary sites for adenocarcinomas include the lung, pancreas, breast, prostate, stomach, liver, and colon. Adenocarcinomas account for only about 2 percent of bladder cancers.

1.2.2b. Risk factor of bladder cancer

A risk factor is anything that may increase a person's chance of developing a disease. It may be an activity, such as smoking, diet, family history, or many other things. Different diseases, including cancers, have different risk factors.

1.2.2c. Causes of bladder cancer

While the exact causes of bladder cancer are not known, there are well-established risk factors for developing the disease. Risk factors for bladder cancer include the following:

➤ Cigarette smoking

Cigarette smoking is a major risk factor for developing bladder cancer. Smoking causes about half of the deaths from bladder cancer among men, and less than one-third of bladder cancer deaths in women. The disease occurs in smokers twice as often as nonsmokers. Quitting smoking reduces the risk of bladder cancer, as well as several other types of cancer and diseases.

➤ Occupational exposure

Certain occupations and work environments that expose workers to dyes and some organic chemicals appear to increase the risk for bladder cancer. Workers in the rubber, chemical, leather, textile, metal, and printing industries are exposed to substances such as aniline dye and aromatic amines that may increase their risk for bladder cancer. Other at-risk occupations include hairdressers, machinists, painters, and truck drivers (due to exposure to diesel fumes).

➤ Chronic bladder irritation

Chronic bladder infections or bladder stones may be linked to certain types of bladder cancer.

➤ Age

The risk for bladder cancer increases with age. Over 70 percent of people with bladder cancer are over age 65.

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➤ **Gender**

Bladder cancer occurs about four times more often in men than in women.

➤ **Race**

Caucasians are twice as likely to develop bladder cancer as African-Americans and Hispanics. Asians have the lowest bladder cancer rates.

➤ **Personal history of bladder cancer**

Individuals who have previously had bladder cancer have an increased risk of developing the disease again.

➤ **Family history**

Individuals with family members who have had bladder cancer are more likely to develop the disease. Research is ongoing to determine specific genetic risks for bladder cancer.

➤ **Parasite infections**

Infection with certain parasites found in tropical regions of the world, but not in the US, increases the risk of bladder cancer.

1.2.2d.Symptoms of bladder cancer

The following are the most common symptoms of bladder cancer. However, each individual may experience symptoms differently. Symptoms may include:

- ✓ visible blood in the urine
- ✓ hematuria - the presence of microscopic red blood cells (RBCs) in the urine.
- ✓ painful urination
- ✓ urgency - frequently feeling the need to urinate without results.
- ✓ frequent urination
- ✓ pelvic or flank pain

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The symptoms of bladder cancer may resemble other medical conditions or problems. Always consult your physician for a diagnosis.

1.2.2d. Diagnosis of bladder cancer

In addition to a complete medical history and physical examination, diagnostic procedures for bladder cancer may include the following:

- **Rectal or vaginal examination** - the physician can check for the presence of tumors large enough to be felt.
- **Cystoscopy (Also called cystourethroscopy.)** - an examination in which a scope, a flexible tube and viewing device, is inserted through the urethra to examine the bladder and urinary tract for structural abnormalities or obstructions, such as tumors or stones. Samples of the bladder tissue (called a biopsy) may be removed through the cystoscope for examination under a microscope in the laboratory.
- **Intravenous pyelogram (IVP)** - a series of x-rays of the kidney, ureters, and bladder with the injection of a contrast dye into the vein. This test is used to detect tumors, abnormalities, kidney stones, or any obstructions, and to assess renal blood flow. It may also be used to rule out other diseases or check for spread (metastasis) of the bladder cancer to other areas of the urinary tract.
- **Laboratory tests** - tests may be performed on the urine to check for blood, chemicals, bacteria, and cells. The urine may be examined microscopically or grown in culture to check for infection. Cancerous cells may be detected using the microscope.
- **Bladder tumor marker studies** - tests to determine cellular characteristics and markers or substances released by bladder cancer cells into the urine.
- **Ultrasound (Also called sonography.)** - a diagnostic imaging technique which uses high-frequency sound waves and a computer to create images of blood vessels, tissues, and organs. Ultrasounds are used to view internal organs as they function and to assess blood flow through various vessels.
- **Computed tomography scan (Also called a CT or CAT scan.)** - a diagnostic imaging procedure that uses a combination of x-rays and computer technology to produce cross-sectional images (often called slices), both horizontally and vertically,

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of the body. A CT scan shows detailed images of any part of the body, including the bones, muscles, fat, and organs. CT scans are more detailed than general x-rays.

- **Magnetic resonance imaging (MRI)** - a diagnostic procedure that uses a combination of large magnets, radiofrequencies, and a computer to produce detailed images of organs and structures within the body.
- **Positron emission tomography (PET)** - in nuclear medicine, a procedure that measures the metabolic activity of cells. A PET scan may show areas of cancer that may not be seen on a CT scan or an MRI scan.
- **Bladder biopsy** -a procedure in which tissue samples are removed (with a needle or during surgery) from the bladder for examination under a microscope; to determine if cancer or other abnormal cells are present.

Once bladder cancer is diagnosed, your physician will determine the grade and stage of the cancer:

- **Grade** - differentiates the cells from normal tissue and estimates the rate of cancer growth.
- **Stage** - indicates the extent the cancer has spread and if other body parts or organs are affected. Additional tests may be needed to determine if bladder cancer is limited to the bladder or if it has spread.

The American Joint Committee on Cancer (AJCC) provides guidelines for staging of bladder cancer. The stages range from Stage 0 to Stage IV. A general description of each stage of bladder cancer follows:

- **Stage 0** - cancer cells are found only on the inner lining of the bladder. This is also called superficial cancer or carcinoma in situ.
- **Stage I** - cancer cells are found deep in the lining of the bladder, but have not invaded the bladder muscle.
- **Stage II** - cancer cells are present in the muscle of the bladder.
- **Stage III** - cancer cells have spread through the bladder muscle into the tissues around the bladder, such as the prostate in men or the uterus in women.

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- **Stage IV** - cancer has progressed further into the abdominal cavity, and may have spread to lymph nodes and other organs in the body.

1.2.2e. Treatment for bladder cancer:

Depending on the extent, bladder cancers may be managed with a single therapy or combination of treatments.

Treatment may include:

➤ **Surgery**

There are several surgical procedures used to treat bladder cancers. Usually, hospitalization and anesthesia are needed. These include:

- **Transurethral resection** - the surgeon inserts a cystoscope through the urethra into the bladder. Tissue containing cancer cells can be surgically removed or burned away with an electric current called fulguration.
- **Cystectomy** - surgery to remove part or all of the bladder.
- **Segmental cystectomy** - removal of a small portion of the bladder that contains the cancerous tissue. This procedure is most effective when there is only a single site of cancer cells in the bladder.
- **Radical cystectomy** - removal of the bladder, lymph nodes near the bladder, and any nearby organs that contain cancer cells. This procedure is usually used when there are multiple areas of cancerous cells in the bladder and there is metastasis to other sites.
- **Radiation therapy**- Radiation therapy uses high-energy rays to kill or shrink cancer cells. Internal or external radiation, or both, may be used in the treatment of bladder cancer. With internal radiation, a radiation implant is placed into the bladder for a direct effect on cancer cells. External radiation uses a machine outside the body to direct rays at a broader area. Radiation therapy for bladder cancer may have side effects including nausea, vomiting, diarrhea, and urinary discomfort, and may affect sexual function in both men and women.

➤ **Chemotherapy**

Chemotherapy uses anticancer drugs to kill cancer cells. Chemotherapy may be given

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internally by placing the drugs directly in the bladder, called intravesical chemotherapy. It may also be given systemically, to affect cancer cells throughout the body. Like other chemotherapy drugs, those used to treat bladder cancer may have side effects that may include hair loss, nausea, vomiting, bruising, and fatigue. Other side effects include mouth sores, an increased risk of infections, and possible kidney damage. Drugs used directly in the bladder may cause irritation or bleeding.

➤ **Biological therapy**

Biological therapy uses the body's own immune system to fight cancer. In one form of this therapy, a solution called Bacillus Calmette-Guerin (BCG) is placed in the bladder, where it stimulates the immune system to kill the cancer cells.

➤ **Clinical trials**

Clinical trials and research studies are underway to evaluate new therapies. Some of these include photodynamic therapy, which involves the use of light to kill cancer cells, and the use of interferon as an anticancer agent.

1.2.2f. Prevention of bladder cancer:

While there is no known way to prevent bladder cancer, The American Cancer Society offers the following recommendations:

- ✓ Do not smoke.
- ✓ Avoid occupational exposure to certain chemicals.
- ✓ Drink plenty of liquids - this may limit the time that cancer-causing substances present in urine will remain in contact with bladder cells.

1.3.0. Interstitial Cystitis

Interstitial cystitis (IC) is complex, chronic disorder characterized by an inflamed or irritated bladder wall. It can lead to scarring and stiffening of the bladder, decreased bladder capacity, and glomerulations (pinpoint bleeding). IC may also be known as:

- ✓ painful bladder syndrome
- ✓ frequency-urgency-dysuria syndrome

Patient with Possible Interstitial Cystitis

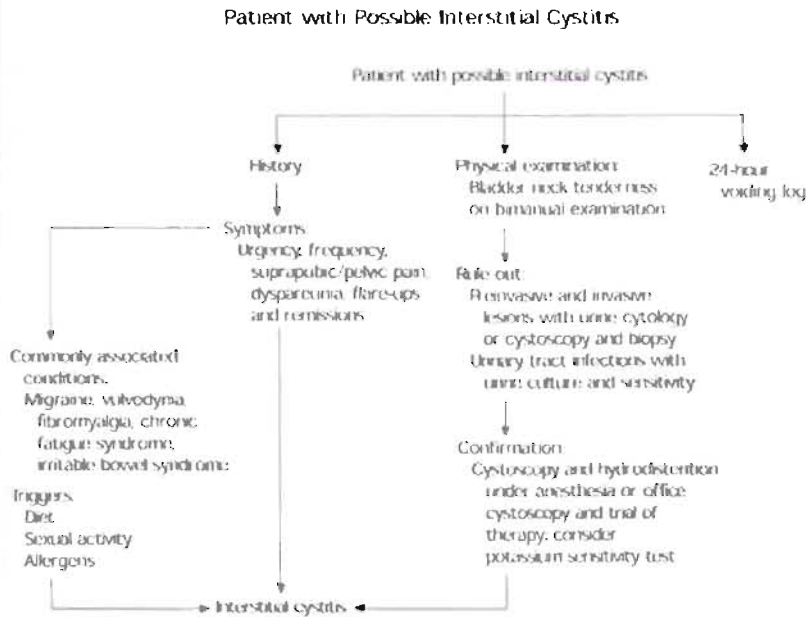


Figure 04 : Cystitis Evaluation of patients with suspected interstitial cystitis.

1.2.3a. Causes of Interstitial Cystitis

The cause of IC is still unknown and patients do not respond to antibiotic medication. Researchers are investigating many theories to understand the causes of IC and to determine appropriate treatments.

1.2.3b. Symptoms of Interstitial Cystitis

The following are the most common symptoms of IC. However, each individual may experience symptoms differently. Symptoms may include:

- ✓ frequent urination
- ✓ feelings of pressure, pain, and tenderness around the bladder, pelvis, and perineum (the area between the anus and vagina or anus and scrotum)

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- ✓ *painful sexual intercourse*
- ✓ *in men, discomfort or pain in the penis and scrotum*
- ✓ *in most women, symptoms may worsen around the menstrual cycle*

Stress may also intensify symptoms, but stress does not cause symptoms to occur.

The symptoms of IC may resemble other conditions or medical problems. Always consult your physician for a diagnosis.

1.2.3c Diagnoses of *interstitial cystitis*:

Because there is no definitive test to diagnose IC, and because symptoms of IC are similar to other urinary disorders, a variety of diagnostic tests and procedures may be necessary. In addition to a complete medical history and physical examination, diagnostic procedures for IC may include the following:

- **Urinalysis** - laboratory examination of urine for various cells and chemicals, such as red blood cells, white blood cells, infection, or excessive protein.
- **Urine culture and cytology**
- **Cystoscopy (Also called cystourethroscopy.)** - an examination in which a scope, a flexible tube and viewing device, is inserted through the urethra to examine the bladder and urinary tract for structural abnormalities or obstructions, such as tumors or stones.
- **Bladder wall biopsy** - a procedure in which tissue samples are removed (with a needle or during surgery) from the body for examination under a microscope; to determine if cancer or other abnormal cells are present.
- **Laboratory examination of prostate secretions (in men)**

1.2.3d. Treatment for IC:

Currently, there is no specific way to diagnose IC, and no cure for IC, making it difficult to treat. Thus, treatments are primarily focused on relieving symptoms, and may include:

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- **Bladder distension** - a procedure aimed at increasing bladder capacity and interfering with pain signals that are being transmitted by the nerve cells in the bladder.
- **Bladder instillation (Also called a bladder wash or bath.)** - the bladder is filled with a solution that is held for varying periods of time, from a few seconds to 15 minutes, before being drained through a catheter.
- **Medication**
- **Transcutaneous electrical nerve stimulation (TENS)** - mild, electric pulses enter the body for minutes to hours two or more times a day either through wires placed on the lower back, or through special devices inserted into the vagina in women or into the rectum in men.
- **Bladder training** - patient voids at designated times and uses relaxation techniques and distractions to help keep to the schedule. Gradually, the patient tries to lengthen the time between the scheduled voids.
- **Surgery**

1.2.3e. Management of IC may also include:

- **Diet modification**

No scientific evidence links diet to IC, but some physicians and patients believe that alcohol, tomatoes, spices, chocolate, caffeinated and citrus beverages, and high-acid foods may contribute to bladder inflammation. Thus, eliminating these substances from the diet may help to eliminate some symptoms.

- **Smoking**

Smoking is a major known cause of bladder cancer.

- **Exercise** Exercise may help relieve symptoms or hasten remission.



1.2.4. Neuregenic Bladder

Neurogenic Disorders of the Urinary Bladder

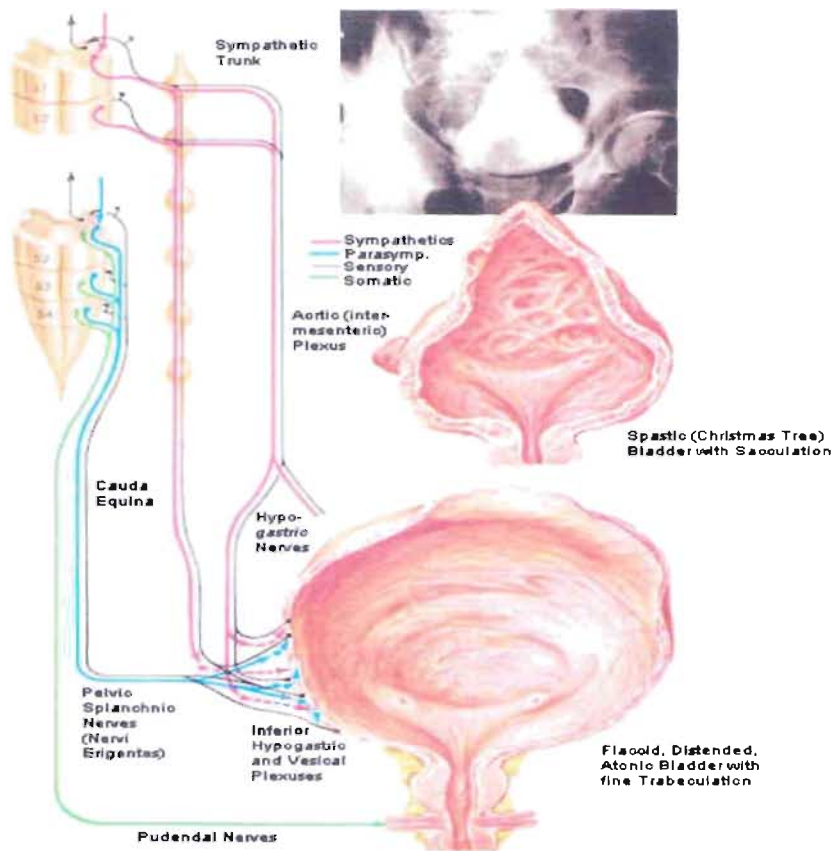


Figure 05: Neuregenic bladder

The muscles and nerves of the urinary system work together to hold urine in the bladder and then release it at the appropriate time. Nerves carry messages from the bladder to the brain and from the brain to the muscles of the bladder telling them either to tighten or release. In a neurogenic bladder, the nerves that are supposed to carry these messages do not work properly.

1.2.4a. Complications of a neurogenic bladder:

The following problems are often associated with a neurogenic bladder:

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➤ **Urineleakage**

Urine leakage often occurs when the muscles holding urine in do not get the right message.

➤ **Urineretention**

Urine retention often happens if the muscles holding urine in do not get the message that it is time to let go.

➤ **Damage to the tiny blood vessels in the kidney**

Damage to the tiny blood vessels in the kidney often happens if the bladder becomes too full and urine backs up into the kidneys, causing extra pressure.

1.2.4b. Infection of the bladder or ureters

Infection of the bladder or ureters often results from urine that is held too long before being eliminated.

1.2.4c. Causes of neurogenic bladder

The following are possible causes of neurogenic bladder:

- ✓ diabetes
- ✓ acute infections
- ✓ accidents that cause trauma to the brain or spinal cord
- ✓ genetic nerve problems
- ✓ heavy metal poisoning

1.2.4d. Symptoms of neurogenic bladder

The following are the most common symptoms of neurogenic bladder. However, each individual may experience symptoms differently. Symptoms may include:

- *urinary tract infection*

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- kidney stones - these may be difficult to determine because you may not be able to feel pain associated with kidney stones if you have spinal cord abnormalities.

Symptoms of kidney stones include:

- ✓ chills
- ✓ shivering
- ✓ fever
- urinary incontinence
- small urine volume during voiding
- urinary frequency and urgency
- dribbling urine
- loss of sensation of bladder fullness

The symptoms of neurogenic bladder may resemble other conditions and medical problems. Always consult your physician for a diagnosis.

1.2.4e. Diagnosis of neurogenic bladder:

When neurogenic bladder is suspected, both the nervous system (including the brain) and the bladder itself are examined. In addition to a complete medical history and physical examination, diagnostic procedures for neurogenic bladder may include the following:

- **X-rays of the skull and spine** - a diagnostic test which uses invisible electromagnetic energy beams to produce images of internal tissues, bones, and organs onto film.
- **Electroencephalogram (EEG)** - a procedure that records the brain's continuous, electrical activity by means of electrodes attached to the scalp.
- **Imaging tests of the bladder and ureters**
- **Tests that involve filling the bladder** (to see how much it can hold and checking to see if the bladder empties completely)

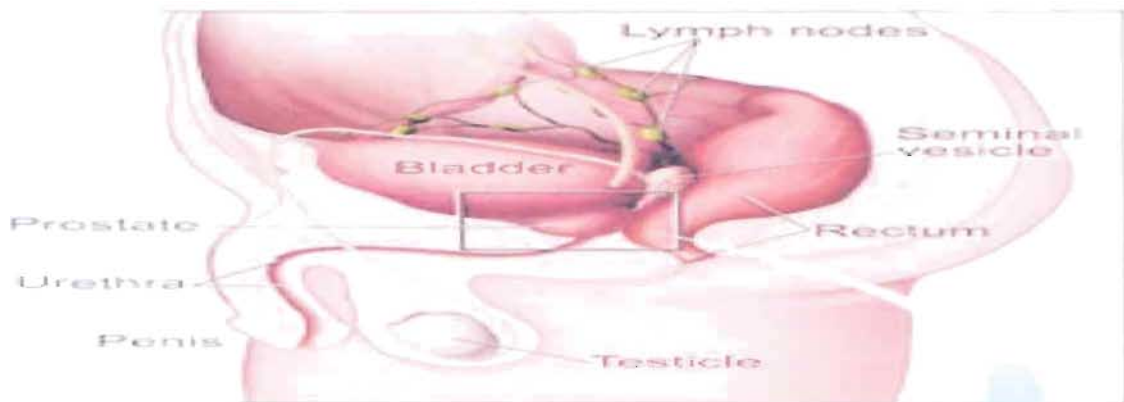
1.2.4f. Treatment for neurogenic bladder:

Treatment may include:

- insertion of a catheter or hollow tube (to empty the bladder at regular intervals)
- prophylactic (preventive) antibiotic therapy (to reduce the incidence of infection)
- placement of an artificial sphincter - a procedure that involves placing an artificial cuff around the neck of the bladder that can be inflated to prevent urinary incontinence and deflated when it is time to empty the bladder. You will still require intermittent catheterization to completely empty the bladder.
- surgery

1.2.5. Prostate Gland Fact

The prostate is a sex gland in men. It is about the size of a walnut, and surrounds the neck of the bladder and urethra - the tube that carries urine from the bladder. It is partly muscular and partly glandular, with ducts opening into the prostatic portion of the urethra. It is made up of three lobes: a center lobe with one lobe on each side.



This shows the prostate and nearby organs.



This shows the inside of the prostate, urethra, rectum, and bladder.

Figure 06: Prostate gland fact

The prostate gland secretes a slightly alkaline fluid that forms part of the seminal fluid, a fluid that carries sperm.

1.2.5a. Types of non-cancerous prostate problems

There are clinical conditions of the prostate gland that are not cancer, including the following:

- **Prostatism** - any condition of the prostate that causes interference with the flow of urine from the bladder.
- **Prostatitis** - an inflamed condition of the prostate gland that may be accompanied by discomfort, pain, frequent or infrequent urination, and, sometimes, fever.
- **Prostatalgia** - pain in the prostate gland.
- **Benign prostatic hyperplasia (Also called BPH or benign prostatic hypertrophy.)** - a specific term that defines the condition of an enlarged prostate. BPH is the most common non-cancerous prostate problem. It can cause discomfort and problems urinating.
- **Impotence (Also called erectile dysfunction.)** - the inability to achieve or maintain an erection.
- **Urinary incontinence** - the loss of bladder control.

1.2.6. Benign Prostatic Hyperplasia (BPH)

BPH (also referred to as benign prostatic hypertrophy) is a condition in which the prostate gland becomes very enlarged and may cause problems associated with urination. BPH can raise PSA (prostate-specific antigen) levels two to three times higher than the normal level. An increased PSA level does not indicate cancer, but the higher the PSA level, the higher the *chance of having cancer*.



Figure06: Benign Prostatic Hyperplasia (BPH)

Some of the signs of BPH and prostate cancer are the same; however, having BPH does not seem to increase the chances of developing prostate cancer. A man who has BPH may also have undetected prostate cancer at the same time or may develop prostate cancer in the future. Therefore, the National Cancer Institute and the American Cancer Society recommend that all men over 50 consult their physicians about having a digital rectal and PSA examination once a year to screen for prostate cancer.

1.2.6a.Symptoms of BPH

The following are the most common symptoms of benign prostatic hyperplasia. However, each individual may experience symptoms differently. Symptoms may include:

- ✓ leaking or dribbling of urine
- ✓ more frequent urination, especially at night
- ✓ urgency to urinate
- ✓ urine retention - inability to urinate.
- ✓ a hesitant, interrupted, weak stream of urine

These problems may lead to one/more of the following:

- ✓ incontinence
- ✓ kidney damage
- ✓ bladder damage
- ✓ urinary tract infections



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- ✓ bladder stones

The symptoms of benign prostatic hyperplasia may resemble other conditions or medical problems. Always consult your physician for a diagnosis.

1.2.6b. Diagnoses of BPH

Diagnosing BPH in its earlier stages can lower the risk of developing such complications. Delay can cause permanent bladder damage for which BPH treatment may be ineffective. In addition to a complete medical history and physical examination, diagnostic procedures for BPH may include the following:

- **Digital rectal examination (DRE)** - a procedure in which the physician inserts a gloved finger into the rectum to examine the rectum and the prostate gland for signs of cancer.
- **Renal ultrasound** - a non-invasive test in which a transducer is passed over the kidney producing sound waves which bounce off of the kidney, transmitting a picture of the organ on a video screen. The test is used to determine the size and shape of the kidney and to detect a mass, kidney stone, cyst, or other obstruction or abnormality.
- **Intravenous pyelogram (IVP)** - a series of x-rays of the kidney, ureters, and bladder with the injection of a contrast dye into the vein to detect tumors, abnormalities, kidney stones, or any obstructions and to assess renal blood flow.
- **Cystoscopy (Also called cystourethroscopy.)** - an examination in which a scope, a flexible tube and viewing device, is inserted through the urethra to examine the bladder and urinary tract for structural abnormalities or obstructions, such as tumors or stones.
- **Urine flow study** - a test in which the patient urinates into a special device that measures how quickly the urine is flowing. A reduced flow may suggest benign prostatic hyperplasia (BPH).

1.2.6c. Treatment for BPH:

Treatment for BPH may include:

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- **Surgery** to remove only the enlarged tissue that is pressing against the urethra, with the rest of the inside tissue and the outside capsule left intact. Types of surgery often include the following:
 - **Transurethral surgery** - no external incision is needed. The surgeon reaches the prostate by inserting an instrument through the urethra.
 - **Transurethral resection of the prostate (TURP)** - a resectoscope - an instrument that is about 12 inches long and 1/2 inch in diameter, contains a light, valves for controlling irrigating fluid, and an electrical loop that cuts tissue and seals blood vessels - is inserted through the penis. The surgeon uses the resectoscope's wire loop to remove the obstructing tissue one piece at a time. The pieces of tissue are carried by the fluid into the bladder and flushed out at the end of the operation.
 - **Transurethral incision of the prostate (TUIP)** - a procedure that widens the urethra by making some small cuts in the bladder neck, where the urethra joins the bladder, and in the prostate gland itself.
 - **Laser surgery** - using laser instruments to vaporize obstructing prostate tissue.
 - **Open surgery** - surgery that requires an external incision; often performed when the gland is very enlarged, when there are complicating factors, or when the bladder has been damaged and needs to be repaired.
- Nonsurgical treatments may include:
 - **Balloon urethroplasty** - a thin tube with a balloon is inserted into the opening of the penis and guided to the narrowed portion of the urethra. The balloon is inflated to widen the urethra and ease the flow of urine.
 - **Transurethral microwave thermotherapy (TUMT)** - a device called a Prostatron uses microwaves to heat and destroy excess prostate tissue to reduce urinary frequency and urgency.
 - **Medications** (to shrink or at least stop the growth of the prostate without using surgery)
 - **Transurethral hyperthermia** - an investigative procedure that uses heat, usually provided by microwaves, to shrink the prostate.

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- **Prostatic stents** - investigative procedure using stents inserted through the urethra to the narrowed area that are allowed to expand, like a spring, and push back the prostatic tissue and widen the urethra.

1.2.6d. Management for BPH

- **Dietary factors**

Increasing your intake of soy, drinking green tea, and taking saw palmetto supplements may benefit the prostate, although this is not yet proven. Also, avoiding or decreasing your intake of alcohol, coffee, and other fluids, particularly after dinner, is often helpful. A higher risk for BPH has been found in association with a diet high in zinc, butter, and margarine, while individuals who eat lots of fruits are thought to have a lower risk for BPH.

- **Eliminate medications that worsen symptoms**

Decongestants and antihistamines can slow urine flow in some men with BPH. Some antidepressants and diuretics can also aggravate symptoms of BPH. Consult your physician if you are taking any of these medications to discuss changing dosages or switching medications, if possible.

- **Kegel exercises**

Repeatedly tightening and releasing the pelvic muscle, also known as "Kegel exercises," is helpful in preventing urine leakage. Physicians recommend practicing this exercise while urinating in order to isolate the specific muscle. To perform a Kegel, contract the muscle until the flow of urine decreases or stops and then release the muscle. It is recommended that men with BPH repeat five to 15 contractions, holding each for 10 seconds, three to five times a day. Consult your physician for more information.

1.2.7a. Prostate Cancer Signs and Symptoms

There are usually no specific signs or symptoms of early prostate cancer - which is why prostate screening is so important. An annual physical examination, prostate-specific antigen

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(PSA) blood test, and digital rectal exam (DRE) provide the best chance of identifying prostate cancer in its earliest stages.

The following are the most common symptoms of prostate cancer. However, each individual may experience symptoms differently. Symptoms may include:

- ✓ weak or interrupted flow of urine
- ✓ urinating often (especially at night)
- ✓ difficulty urinating or holding back urine
- ✓ inability to urinate
- ✓ pain or burning when urinating
- ✓ blood in the urine or semen
- ✓ nagging pain in the back, hips, or pelvis
- ✓ difficulty having an erection



The symptoms of prostate cancer may resemble other conditions or medical problems. Always consult your physician for a diagnosis. As a man gets older, his prostate may grow bigger and obstruct the flow of urine, or interfere with sexual function. An enlarged prostate gland - a condition called **benign prostatic hyperplasia** - may require treatment with medicine or surgery to relieve symptoms. This common benign prostate condition, which is **not** cancer, can cause many of the same symptoms as prostate cancer

1.2.7b. Prostate Cancer Risk Factors

In general, all men are at risk for prostate cancer. However, there are specific risk factors that increase the likelihood that certain men will develop the disease, including the following:

➤ **Age**

Age is a risk factor for prostate cancer, especially men age 50 and older. More than 70 percent of all prostate cancers are diagnosed in men over the age of 65.

➤ **Race**

Prostate cancer is nearly 60 percent more common among African-American men

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than it is among Caucasian-American men. Japanese and Chinese men native to their country have the lowest rates of prostate cancer. Interestingly, when Chinese and Japanese men immigrate to the US, they have an increased risk and mortality rate from prostate cancer, when compared to their native populations. In Japan, the incidence of prostate cancer has increased as Western diets and lifestyles have been adopted.

➤ **Diet**

Epidemiological data suggests that the diet consumed in Western industrialized countries may be one of the most important contributory factors for developing prostate cancer. Consider the following information regarding diet and its effect on the risk for prostate cancer:

▪ **Fat**

Studies suggest that men who eat a high-fat diet may have a greater chance of developing prostate cancer.

▪ **Fiber**

Dietary fiber intake may influence circulating levels of testosterone and estradiol, which, in turn, may decrease the progression of prostate cancer.

▪ **Soyprotein**

Besides lower fat intake, another major difference between Asian and American diets is the consumption of soy, averaging 35 g a day per capita. Soy contains isoflavones which, in several studies, have been found to inhibit the growth of prostate cancer.

▪ **Vitamin E and selenium**

Vitamin E, an antioxidant, combined with selenium, has been shown to inhibit tumor growth in laboratory animals.

▪ **Carotenoids**

Carotenoids containing lycopenes have been shown to inhibit the growth of human prostate cancer cells in tissue cultures (cells grown in the laboratory). The primary source of lycopenes is processed tomatoes in tomato juice and tomato paste.

▪ **Herbal preparations**

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Combination herbal preparations should be used with caution as reported side effects have included venous thrombosis, breast tenderness, and loss of libido. Many herbal preparations have not been studied in men with prostate cancer.

➤ **Obesity**

Obesity not only contributes to diabetes and high cholesterol, but has also been associated with some common cancers, including hormone-dependent tumors such as prostate, breast, and ovarian cancer.

➤ **Environmental exposures**

Some studies show an increased chance for prostate cancer in men who are farmers, or those exposed to the metal cadmium while making batteries, welding, or electroplating. Additional research is needed in this area to confirm whether this is a true association.

➤ **Having a vasectomy, BPH (benign prostatic hyperplasia), or STD (sexually transmitted disease)**

Researchers have looked at whether men who have had a vasectomy, BPH, or those who have been exposed to a sexually transmitted disease are at increased risk for prostate cancer. Some studies suggest a link, while others do not support these claims.

➤ **Family history of prostate cancer**

Having a father or brother with prostate cancer more than doubles or triples a man's risk of developing this disease. The risk is even higher for men with several affected relatives, particularly if the relatives were young at the time of diagnosis. Geneticists (physicians and scientists who study inheritance and the causes of genetic disease) divide families into three groups, depending upon the number of men with prostate cancer and their ages of onset, including the following:

- **Sporadic** - a family with prostate cancer present in one man, at a typical age of onset; sporadic means 'occurs by chance.'
- **Familial** - a family with prostate cancer present in more than one person, but with no definitive pattern of inheritance and usually an older age of onset.

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▪ **Hereditary** - a family with a cluster of three or more affected relatives within any nuclear family (parents and their children), a family with prostate cancer in each of three generations on either the mother or father's side, or a cluster of two relatives affected at a young age (55 or less). Five to 10 percent of prostate cancer cases are considered hereditary.

➤ Genetic factors

. The chromosomes contain the body's blueprint, our genes. Genes code for traits such as eye color and blood type, and also control important regulatory functions in the body such as the rate of cell growth. Some genes, when altered or mutated, give a higher risk for uncontrolled cell growth, which, in turn, can lead to tumor development. These genes have various names, but overall are referred to as "cancer susceptibility genes." Approximately 5 percent to 10 percent of all prostate cancers are known to be attributed to an inherited DNA change, such as the cancer susceptibility gene.

1.2.7d. Prostate Cancer: Stages

When prostate cancer is diagnosed, tests will be performed to determine how much cancer is present, and if the cancer has spread from the prostate to other parts of the body. This is called staging, and is an important step toward planning a treatment program. As defined by the National Cancer Institute (NCI), the stages of prostate cancer include the following

Stage	Feature
Stage I	tumor cells are found in less than 5 percent of prostate tissue removed, and the cells are not very aggressive in nature sometimes referred to as stage A
Stage II	tumor cells are found in less than 5 percent of prostate tissue removed, and the cells are more aggressive in nature or the tumor is larger in size, but is confined to the prostate gland sometimes referred to as Stage B
Stage III	tumor cells are found in less than 5 percent of prostate tissue removed, and the cells are more aggressive in nature or the tumor is larger in size, but is confined to the prostate gland sometimes referred to as

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	Stage B
Stage IV	the tumor has spread to other structures beyond the seminal vesicles to any other organ or structure sometimes referred to as Stage D1 or D2
Recurrent	the cancer has come back (recurred) after treatment; it may recur in the prostate or in another part of the body sometimes referred to as Stage D3

Table 3:The stage of the prostate cancer.

1.2.7e.Prostate Cancer Grading

According to the National Comprehensive Cancer Network (NCCN), one way of grading prostate cancer is the Gleason System. This grading system is based on a number range from 2 to 10. The lower the number, the lower the grade, and the slower the cancer is growing. The higher the score, the higher the grade of the tumor. High-grade tumors grow more quickly than low-grade tumors, and are more likely to spread to other parts of the body.

- **Grades under 6** mean that the cancer cells look similar to the normal cells, and the cancer is likely to be less aggressive.
- **Grade 7** is in the intermediate range. This means that the cancer cells do not look like normal cells, and are more likely to be aggressive and grow faster.
- **Grades 8 to 10** indicate that the cancer cells are more likely to be very aggressive in growth.

1.2.7f.Prostate Problems: Diagnostic and Evaluation Procedures

Procedures used to evaluate prostate problems:

In addition to an annual physical examination that includes blood, urine, and possibly other laboratory tests, the National Cancer Institute and the American Cancer Society suggest consulting your physician about these recommendations for the evaluation of the prostate gland:

➤ **DRE (digital rectal examinations)**

As recommended by your physician, DREs are usually conducted annually for men

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over the age of 50. Men in high-risk groups, such as African-Americans, or those with a strong family history of prostate cancer should consult their physicians about being tested at a younger age.

➤ **PSA (prostate-specific antigen)**

PSA is a blood test that measures the level of prostate specific antigen. PSA is a substance produced by the prostate gland, which may be found in higher amounts in men who have prostate cancer. As recommended by your physician, the PSA test is usually done annually for men over the age of 50. Men in high-risk groups, such as African-Americans, or those with a strong family history of prostate cancer, should consult their physicians about being tested at a younger age or more often.

1.2.7g. Some other prostate cancer evaluation procedures

If the DRE or PSA are unusual, your physician may repeat the tests or request an ultrasound and other procedures. These evaluation tools may include:

- **Transrectal ultrasound (TRUS)** - a test using sound wave echoes to create an image of the prostate gland to visually inspect for abnormal conditions such as gland enlargement, nodules, penetration of tumor through capsule of the gland, and/or invasion of seminal vesicles; may also be used for guidance of needle biopsies of the prostate gland and/or guiding the nitrogen probes in cryosurgery.
- **Computed tomography scan (Also called a CT or CAT scan.)** - a diagnostic imaging procedure that uses a combination of x-rays and computer technology to produce cross-sectional images (often called slices), both horizontally and vertically, of the body. A CT scan shows detailed images of any part of the body, including the bones, muscles, fat, and organs. CT scans are more detailed than general x-rays.
- **Magnetic resonance imaging (MRI)** - a diagnostic procedure that uses a combination of large magnets, radiofrequencies, and a computer to produce detailed images of organs and structures within the body.
- **Radionuclide bone scan** - a nuclear imaging method that helps to show whether the cancer has spread from the prostate gland to the bones. The procedure involves an

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injection of radioactive material that helps to locate diseased bone cells throughout the entire body, suggesting possible metastatic cancer.

- **Lymph node and/or prostate biopsy** - a procedure in which tissue samples are removed (with a needle or during surgery) from the body for examination under a microscope; to determine if cancer or other abnormal cells are present.

1.2.8. Urinary Incontinence

Urinary incontinence (UI) is the loss of urine control, or the inability to hold your urine until you can reach a restroom. UI can strike at any age. Women over age 50 are the most likely to develop UI. Urinary incontinence may be a temporary condition, resulting from an underlying medical condition.

1.2.8a. Causes of urinary incontinence

Incontinence is not an inevitable result of aging, but is particularly common in older people. It is often caused by specific changes in body function that may result from diseases, use of medications, and/or the onset of an illness. Sometimes, it is the first and only symptom of a urinary tract infection.

1.2.8b. Different types of urinary incontinence

The following are some of the different types of urinary incontinence:

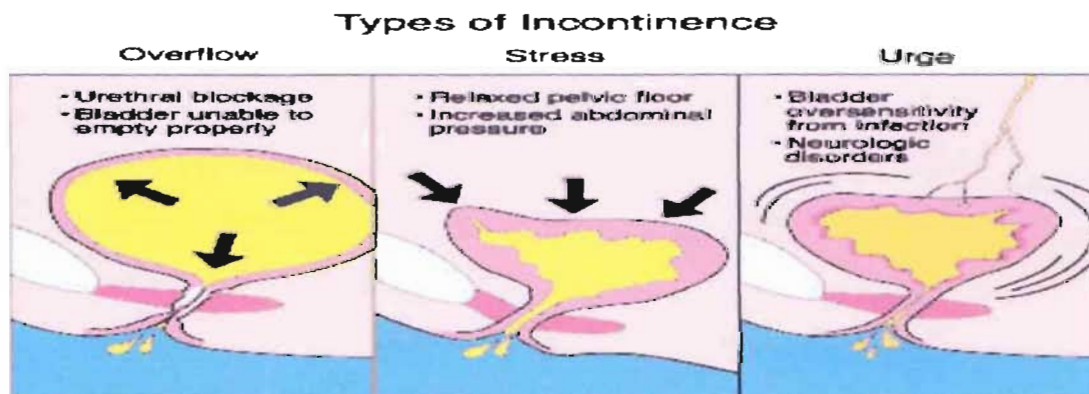


Figure 06: Types of urinary incontinence

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- **Urge incontinence** - the inability to hold urine long enough to reach a restroom. It is often found in people who have conditions such as diabetes, stroke, dementia, Parkinson's disease, and multiple sclerosis, but may be an indication of other diseases or conditions that would also warrant medical attention.
- **Stress incontinence** - the most common type of incontinence that involves the leakage of urine during exercise, coughing, sneezing, laughing, lifting heavy objects, or other body movements that put pressure on the bladder.
- **Functional incontinence** - leakage due to a difficulty reaching a restroom in time because of physical conditions such as arthritis.
- **Overflow incontinence** - leakage that occurs when the quantity of urine produced exceeds the bladder's capacity to hold it.

1.2.8c. The symptoms of urinary incontinence

The following are the most common symptoms of urinary incontinence. However, each individual may experience symptoms differently. Symptoms may include:

- inability to urinate
- pain related to filling the bladder and/or pain related to urination without a proven bladder infection
- progressive weakness of the urinary stream with or without a feeling of incomplete bladder emptying
- an increased rate of urination without a proven bladder infection
- needing to rush to the restroom and/or losing urine if you do not get to restroom in time
- abnormal urination or changes in urination related to a nervous system
- abnormality such as stroke, spinal cord injury, multiple sclerosis
- leakage of urine that prevents activities
- leakage of urine that began or continued after surgery
- leakage of urine that causes embarrassment
- frequent bladder infections

1.2.8d.Diagonosis of urinary incontinence

For people with urinary incontinence, it is important to consult a physician for a complete physical examination that focuses on the urinary and nervous systems, reproductive organs, and urine samples. In many cases, patients will then be referred to a urologist, a physician who specializes in diseases of the urinary tract.

1.2.8e.Treatment for urinary incontinence

Treatment may include:

- certain behavioral techniques (including pelvic muscle exercises, biofeedback, and bladder training)
- medications
- surgery (if the incontinence is related to structural problems such as an abnormally positioned bladder or a blockage)
- diet modifications (including eliminating caffeine in coffee, soda, and tea, and/or eliminating alcohol)

1.2.8f.Managing urinary incontinence

There are many products and devices available for managing urinary incontinence. Specifically designed absorbent underclothing is available - which is no more bulky than normal underwear and can be worn easily under everyday clothing. Other incontinence products include washable, adult cloth diapers or contoured cloth diapers with plastic covers.

In some cases, depending upon the type of incontinence and after other management methods have proven to be ineffective, a catheter may be inserted into the urethra to collect the urine. Catheters may be used occasionally or on a constant basis, in which case a tube connects to a bag that attaches to the leg. Men can use a type of external catheter, condom catheter device, that is placed over the penis and connects to a bag that attaches to the leg.



Objective

The objective of this study are-

- To observe the different types of urinary disease are present in Bangladesh.
- To observe the most common form of urinary disease in bangladesh
- To see the management of urinary disase .
- Different types of antibiotics are used in the treatment of urinary disease
- Whether the use of antibiotic is rational.
- Except the antibiotic other drug used in the treatment of urinary disease.
- To observe the physical condition of patient while they are under treatment.
- To identify the prevalence of urinary disease in Bangladesh.

Methodology

Chapter 2



Urinary Disease and treatment condition of Bangladesh

2.0 Methodology

In this study I am going to discussed about the severity of urinary disease and treatment in Bangladesh. Bangladesh is developing country in south asia .People of this country are suffering many fetal disease. Urinary disease is one of the most complicated disesas.the patient of urinary disease are increasing day by day but the treatment facilities are not increasing sufficiently.To observe this situation I am decided to research in this topic.For doing this I have followed some step.Firstly, I have collected the permeation letter from the department head of the university with the help of my advisor .This application helped me to collect the data from several medical college and hospital.

Place of study: This study was accomplished among the patients of urology department of several medical college institute and hospital situated throughout the Dhaka city.

Bangabandhu Shekh Mujib Medical University: This medical university is situated at Shahabag in Dhaka. There are several specialized ward in this university.Urology ward is one of them.After submitted the application form to the director general and approval I went to the nursing station of that ward showed my permit copy.After conformation, they also permit me to enter into the ward and work very carefully.Then I went to the individual bed and with respect I was told them to my objective and started to my data collection.Every patient respond me and share their disease related information frequently without hesitation. All the nurse and word boy was also very cordial and helpful.

By the same way I was collected data from the patient of other four different hospital.

Name of institution	Number of patient
Bangabandhu Shekh Mujib Medical University	21
Dhaka medical college and hospital	23
Sir Salimullah Medical College and hospital	16
National Institute of Kidney Disease and Urology	15

Table : Sample collection area and number of patient.

Urinary Disease and treatment condition of Bangladesh

2.1 Reason of choosing: Bangladesh is not a well developed country.the health service is not well organized throughout the country.there are few specilized hospital and ward are here for specifics disease.the main reason of choosing these hospital is that these are the biggest hospitls in the country.to get better treatment the patient of urinary disease are from different place are come here.Most of the expertise doctors of the country work here.So patient of different social and economic classes come here.As a result these hospital represents the whole Bangladeshi's urinary patient situation.

2.2Survey duration: The survey was continued for three months.

2.3Sample selection criteria: The sample was selected according to the disease of the patient.Here in the questionnaires patient's name,age, gender, religion, education level, occupation and address were include.But the main point of veiw was the patients symptoms of disease, duration of disease,diagonosis system, madication and current physical condition.



Picture: Interview from patient

2.4 Sample size: 77 patients of urinary system related problem were count as sample.

Mode of sample collection:For collecting data I went to the indoor of urology department of different hospital and every patient bed one by one to collect the data.I made questionnaires previously for write down the data.besides the vocal interview of the patient I also follow the file of every patient in which the total treatment policy were recorded. From the file I collect the investigation and madication.

Urinary Disease and treatment condition of Bangladesh

Interview of Doctors: As a part of the survey some important information were collected from the specialist doctors. Main purpose of the interview was, to observe the management of the patients and their comment about the treatment procedure. Another important matter was to know the major group of medication by which the patients are treated. The interview was collected from several specialist doctors, all of the doctors were response well and share their experience. All of the doctors information were nearly same.



Picture: Interview of Prof. Dr. Faruq



2.5 Questionnaire

Survey on urinary disease and treatment condition in Bangladesh

Doctors interview form

The Name of the hospital and district:

General information

1. Doctor's name:
2. Professional Experience (years):
3. Specialization:
4. Higher Degree:

Survey specific question

1. What type of urinary disease patient come to your ward more ? (put* based on priority)

- i. Urinary Tract Infection
- ii. Urinary Tract Obstruction
- iii. Acute Glomerular Nephritis
- iv. Nephritic Syndromes
- v. Acute Renal Failure
- vi. Chronic Renal Failure
- vii. Renal calculi
- viii. Others

Urinary Disease and treatment condition of Bangladesh

2. In what stage the patient come to the doctor more?

i. Mild stage ii. Moderate stage iii. Sever stage

3. When you advice the patient to admit into hospital?

4. What class of drug you prescribe frequently to your urinary disease patient?

i. Antibiotic a) b) c)

ii. Others a) b) c)

5. Do you think these drugs are effective for patient? Yes/no

6. Do you think surgery is important for the patient? Yes/no

7. Do you have any experience that you have prescribed drug, but not for the particular patient?

8. Do you think patient complete the course of therapy?

9. Do you have any advice your patient in detail to complete to complete the full course of therapy with proper time schedule?

a) Yes b) No c) Sometime

10. Do you think these disease is a result of any other disease?

a) Diabetes b) Hypertension c) Others

11. Do you think in Bangladesh have proper treatment for this disease?

Thank you for your coordination



Chapter-3

Result and discussion

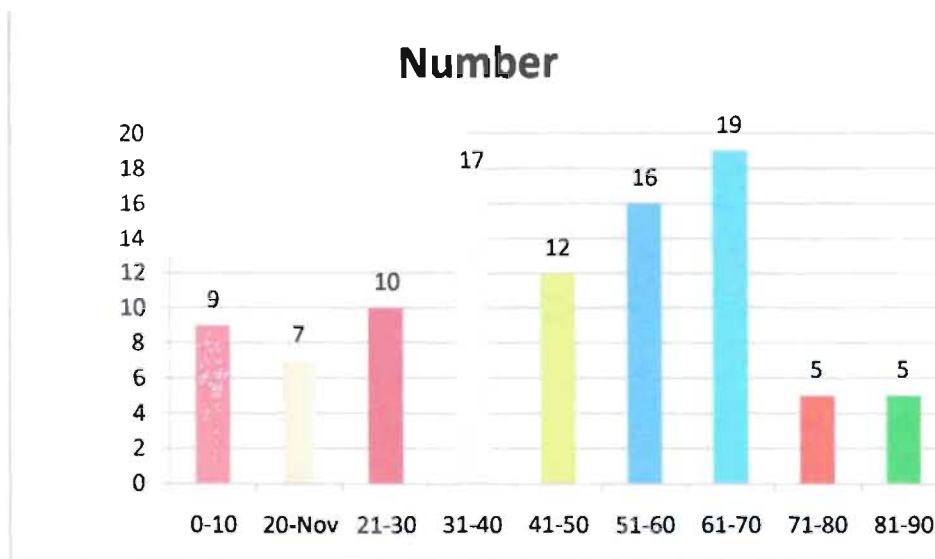
3.0 Data Interpretation and Results: Microsoft Excel is used to interpret the collected data and made conclusion.

3.1 Result and discussion of survey

Urinary disease is not a single disease, its associated with the disorder of different part of the urinary system. urinary disease is the major health problem among population of the countries throughout the world. Although the urinary disease is the silent and slow developing disease, at the primary stage of the development people are not aware of the disease. As a result when the diseases are identified it turned to a sever stage. But it is a hopeful that, now a days the treatment policy are improving with time throughout the world. There are a wide varieties of therapeutic interventions is available for treatment of urinary disease. Besides the medication in most case surgery is also important, these surgery are being done successfully. Several class of antibiotic, anticholinergic, genitourinary antispasmodic drugs are available for the treatment of urinary disease. Guideline for the management of urinary disease in primary care have been developed published in various countries around the world. All these guideline recommended the prescription of different analgesic, antispasmodic and anti diuretic drug for symptomatic relief in the management of urinary disease. In Bangladesh the prevalence of urinary disease is increasing day by day. There several factor associated with the cause of urinary disease, diabetes, acute infections, accidents that cause trauma to the brain or spinal cord, genetic nerve problems, heavy metal poisoning, sexual intercourse are the main cause of urinary disease.

3.2 Ages Of the patients

Age is the most important risk factor for urinary disease. mainly elder patient are more suffering from this disease. Although child and middle age people are also suffering from this disease. The incidence of UTI in women tends to increase with increasing age. Several peaks above baseline correspond with specific events, including an increase among women aged 18-30 years (associated with honeymoon cystitis and pregnancy). Older adults have a higher incidence of renal corticomedullary abscesses. The risk for bladder cancer increases with age. Over 70 percent of people with bladder cancer are over age 65. Age is a risk factor for prostate cancer, especially men age 50 and older. More than 70 percent of all prostate cancers are diagnosed in men over the age of 65.



3.3 Variability of urinary disease among gender

This survey was done in different five hospital in both male and female ward. It was found that overall male are more susceptible to the urinary disease than female. But urinary tract infection predominantly occur in female than male

Gender	No. of Patient
Male	73
Female	27

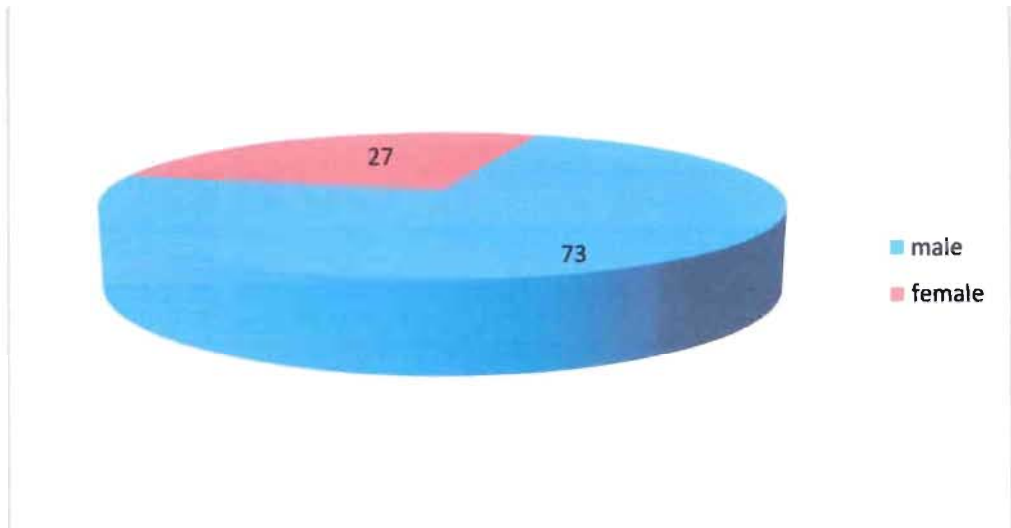


Figure 2: Variation of urinary disease among gender



3.4 Duration of Illness:

Urinary disease is a silent disease. So patients are not aware about the disease. At primary stage some of the symptom can be observed but by taking medication symptomatic relief can be obtained but cure is not possible. As a result after a certain period of time the disease turned to be severe and then it is necessary to admit into the hospital. From this study it has been observed that, the patient of this disease are suffering from few month to several hours. From this study it is obvious that 0-6 months and 1-5 years duration of illness are preferential.

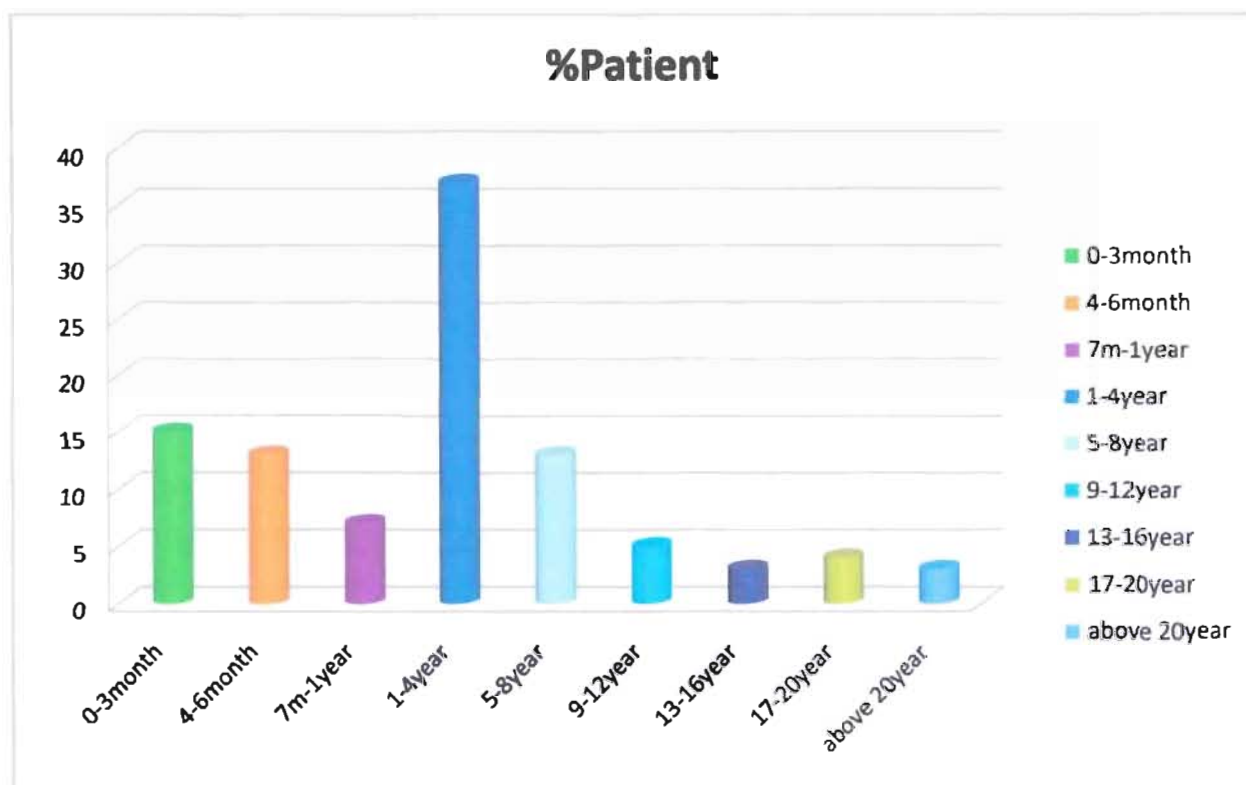


Figure 3:Duration of illness

3.5 Associated Problem:

From the study of the survey it is observed that most of the patient of urinary disease are also suffering some associated problem. Besides the treatment of urinary disease they are also treat that problem. But most often this problem hamper the main treatment. It is also observed that some patient only suffering the urinary disease.

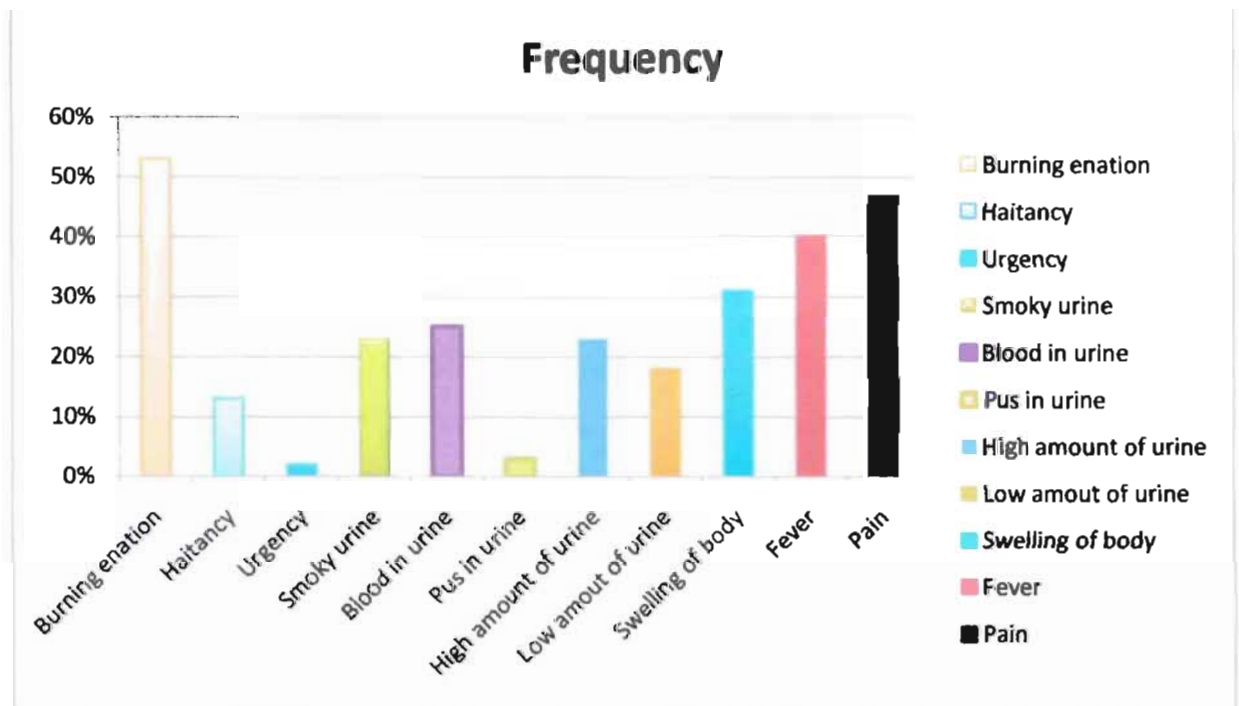


Figure 4:Associated problem

Urinary Disease and treatment condition of Bangladesh

3.6 Patients Type:

According to the type of treatment procedure all admitted patient can be divided into two group. Some of the patients are treated only by medicine, there surgery is not essential. On the other hand a large number of patients are treated by doing surgery. In this case only medicine can't be cure the disease. So the Physician decided to do surgery for the beinfit of patients.

Type of Patient	No. of Patient
Surgical	65
Nonsurgical	35

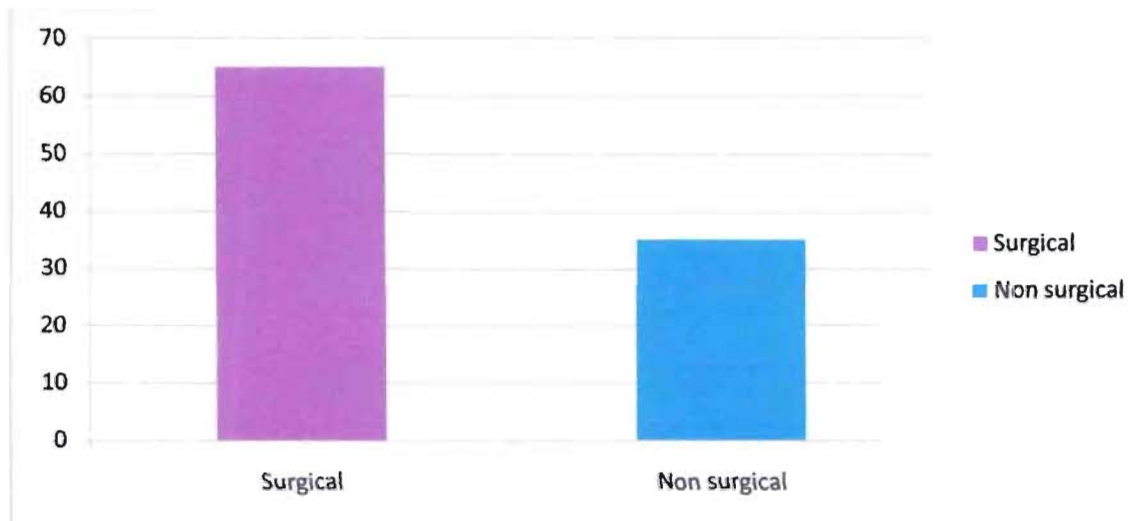


Figure 5: Patients Types based on Treatment

3.7 Physical condition of patients

Most of the patient are admitted in hospital at a severe stage. After treatment the patient become cure. This survey study show that, the patient physical condition are under treatment are not always improve. A significant number of patients physical condition are not being changed. This may happen due to they have need to the treatment procedure or the bacterial resistance. It is also shown that, some of the patients physical condition are deprived, due to their severity of disease and older age.

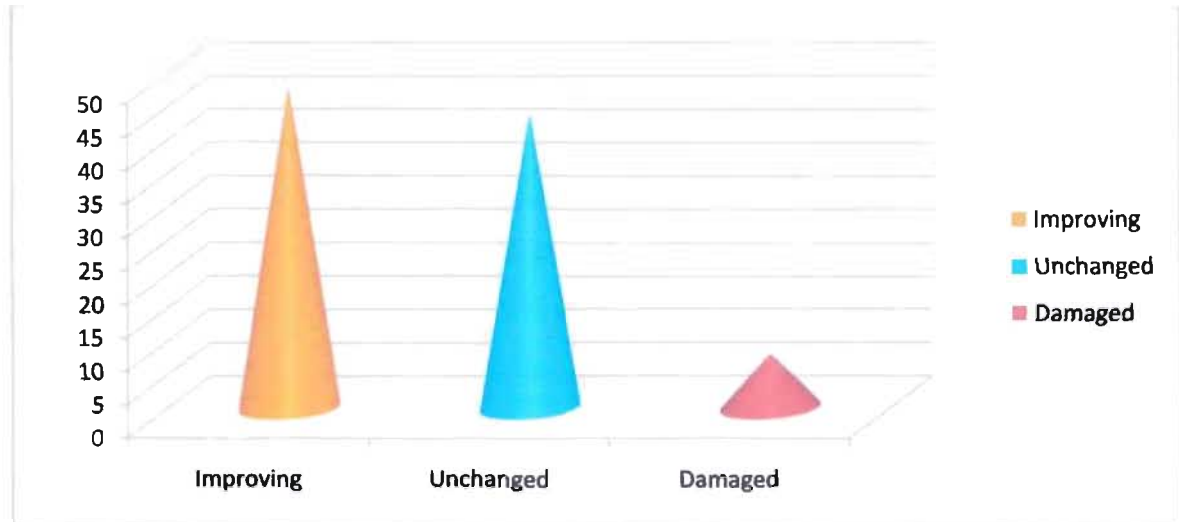


Figure 06:Patients physical condition under treatment.

3.8 Antibiotics:

Empiric antimicrobial therapy should cover all likely pathogens in the context of this clinical setting. The prolonged or repeated use of antibiotics may result in fungal or bacterial overgrowth of non susceptible organisms, super infections, or infections with *Clostridium difficile*.

Antibiotics sometimes are used in combination. Sometimes these combinations work against each other (ie, are antagonistic); examples would include beta-lactams (such as penicillin) and tetracyclines. Antagonism is defined as at least a 99% decrease in killing by the combination (when compared with the most active antimicrobial alone).

Different types of antibiotics are used in urinary disease. Although the antibiotics are not the perfect medication of all disease .Mainly antibiotics are used in case of urinary tract infection benign prostatic hyperplasia and as a post operative treatment.

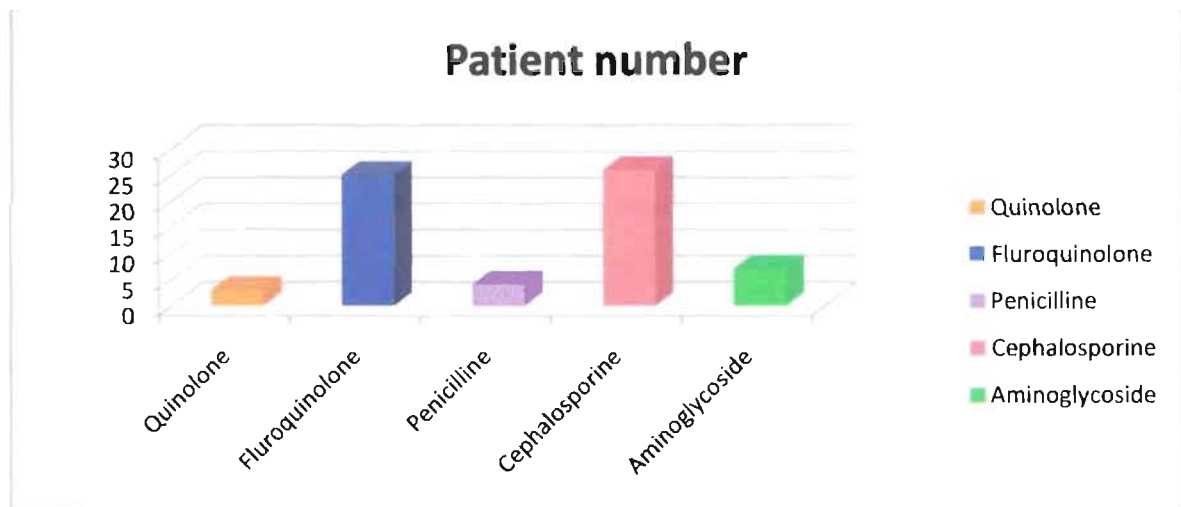


Figure 07: Different Types of antibiotics used in treatment.

3.9 The use analgesic Drugs:

Most of the urinary diseases are very painful, mainly the urinary tract infection, prostate cancer, benign prostatic hyperplasia, interstitial cystitis, in bladder cancer painful urination and pelvic or flank pain are common. On the other hand after surgery the patient suffers severe pain. To control these painful symptoms, it is necessary to use analgesic drugs. From this study it is observed that different types of analgesic drugs are used. Diclofenac, Ketorolac, Timonium methyl sulphate, etc. are used commonly. In case of severe pain mainly post-operative pain management pathedrine are used, but its uses are less.

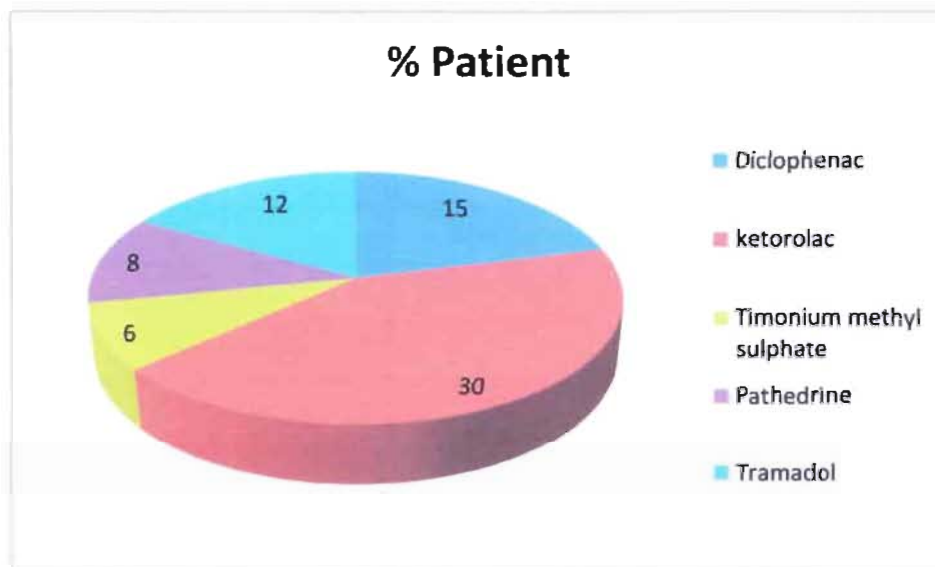


Figure 08: The use of analgesic Drug.

3.10. Other drugs

For the treatment of urinary disease some urinary antispasmodic drugs are used to decrease the auto urination. these drugs act by removing the urinary spasm. Besides the antibiotics and antispasmodic drugs other classes of drugs such as sedative and antidepressant drugs are used as a adjunct therapy. Majority of the patients are suffering from the depressant, As a result they can not sound sleep. Various types of multivitamines are used. Most of the patients have malnutrition besides after surgery huge volume of blood are exclude from the body. So to balance the body blood and protein multivitamines are prescribed. The vitamin C act as an antioxidant and it help to healing the injured portion of the body, so vitamine C also frequently prescribd.

Group	Name of Drug
Sedative	Diazepam, Clobazam, Bromazepam, Midazolam
Antidepressant	Citalopram, Duloxetine, Fluoxetine
Antispasmodic	Tamsulosin, Oxybutynin, Finasteride, Tolteridine
Vitamine	Vitamine C, Multivitamine

Table 04: Uses of other classes of drugs.

Conclusion

The aim of this survey study is to observed the present condition of urinary disease in Bangladesh and to see the treatment procedure of the hospitals. Most of the urinary disease occure very silently, without show any sign and symptomes. In that case at the primry state of the developmen of the disease some symptome can appear and symptomatic relief can be get by taking local medication. But the disease can not be cure. So while the patient fell any shorts of disturbness on the function of urinary system. They should consult to the expert physican. From this study it, is observed that, most of the urinary disease do not occure due to the genetetic factor. Aging is one of the most important factor in case of urinary disease. As the people get older, the ability of the bladder and kidney decrease gradually. As a result the urinary system can not work properly. In case of female, while a female birth a child, she has a greater risk of urinary tract infction. So during child labour the female should take help from the expert physican or gynecologist in hospital to prevent the risk factor of urinary tract infection.





Chapter 4

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