

Antibiotic Prophylaxis to prevent Urinary Tract Infection following Urinary Catheterization in Geriatrics

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ABSTRACT

Background: Urinary Catheterization is a common procedure in the elderly population. Literature showed that up to 40% of the nosocomial infections are caused by urinary tract infection related to urinary catheterization. Some studies suggest using prophylactic antibiotics prior to insertion of urinary catheter in the elderly to minimize the chances of urinary tract infection related to the procedure. This study was performed to evaluate the risk of urinary tract infection related to catheter insertion and the benefit of using prophylactic antibiotics prior to catheter insertion.

Methods: A retrospective study for 100 elderly patients from skilled Nursing facility and home care was done. The study reviewed the files and medical records of the patients between May 2011 to May 2012. The study examined incidence of UTI after catheterization and whether the use of prophylactic antibiotics was necessary before insertion of urinary catheter.

Results: The study revealed 72 patients out of the 100 patients enrolled in the study (72%) were free of UTI after insertion of urinary catheter. 28 patients out of 100 (28%) suffered from UTI after the insertion of urinary catheter.

25 patients out of 28 patients who had UTI had the urinary catheter for more than 2 weeks.

25 out of 28 UTI patients did not receive prophylaxis antibiotics, 3 out of the 28 patients received antibiotic prophylaxis and suffered UTI.

Conclusion: Urinary catheters are commonly used among elderly patients. There are several reasons for the use of urinary catheter. The most common is urinary incontinence, bedsores protection, urinary retention, and output monitoring.

There is no need for using prophylactic ABX before or after the insertion of urinary catheter for the elderly patient.

Insertion of urinary catheter under aseptic conditions is important to prevent procedure induced urinary tract infection.

Key words: Antibiotic prophylaxis, UTI, Catheterisation, geriatrics

Definition

Urinary tract infection is the presence of bacteria in urine, kidney, urinary bladder, urethra or prostate.

UTI is one of the most common infections in the elderly.

Urinary catheter (tube inserted through the urethra to drain urine from the bladder to urine collecting bag).

Urinary tract infection may occur when the elderly patient catheterized for a prolonged period (>2 weeks). The colonized organisms may invade the mucosa of the urinary bladder and cause bacteriuria, cystitis and may cause bacteremia.

Types of urinary catheters

1. Indwelling catheters (urethral or suprapubic) can be used for short and long term catheterization.
2. External catheters e.g. (condom catheters) used for men with dementia and pressure sores and have lower risk of infection.
3. Intermittent catheterization is used for short periods post surgically and in rehabilitation after spinal cord injury, and will be removed after emptying the urinary bladder.

Causes of UTI during urinary catheterization

Urinary tract infection is a common disease in elderly patients. The prevalence of UTI approaches 40 % of nosocomial infections. According to the landmark studies 10-27% of the catheterized patients will develop bacteriuria within 5 days of hospitalization, 4% of the catheter related UTI will develop bacteremia. Most patients with long term urinary catheters are elderly.

There are many causes for contracting UTI in elderly, especially diabetics and immune compromised patients; among these are contamination and colonization of bacteria following urinary catheter insertion, residual urine in the collecting urine bags, bacteria from the bowel and backward flow from the catheter to urinary bladder.

UTI can be life threatening and cause severe complications in elderly. These can be prevented or reduced if proper hygiene is followed during and after insertion of urinary catheters and if the symptoms are discovered and treated early.

The most common bacteria that causes UTI in elderly are E-coli, Pseudomonas, candida albicans staphylococcus and enterococcus species.

Proteus and pseudomonas are the common causes of biofilm growth on the urinary catheters.

Many complications can occur as a result of urinary catheterization; among these are urinary tract infections, obstruction of the catheter, urinary calculi, local trauma, bladder fibrosis, prostatitis, pyelonephritis, local infection e.g. urethritis, local abscesses, tubule-interstitial nephritis.

Background

This is a retrospective study of the need for antibiotic prophylaxis for preventing UTI following urinary catheter insertion in the home care services and skilled nursing facility from 1st of May 2011 till 1st of May 2012.

The goal of the study

To evaluate the need of using prophylactic antibiotics before or after the insertion of urinary catheters.

Epidemiology

Place: Home Care, Skilled Nursing Facility, Doha, Qatar.

Duration: 12 months.

Date: 1st of May 2011 - 1st May 2012.

Patients number: 100

Method of data collection: patients' files.

Method of diagnosis: The criteria that has been used for the diagnosis of UTI depended on symptoms like fever, abdominal pain, decreased urine output, change of urine color, hematuria and lab works like CBC, Urine routine and culture.

Figure 1. Total number of the patients is 100 out of which 55 males and 45 females

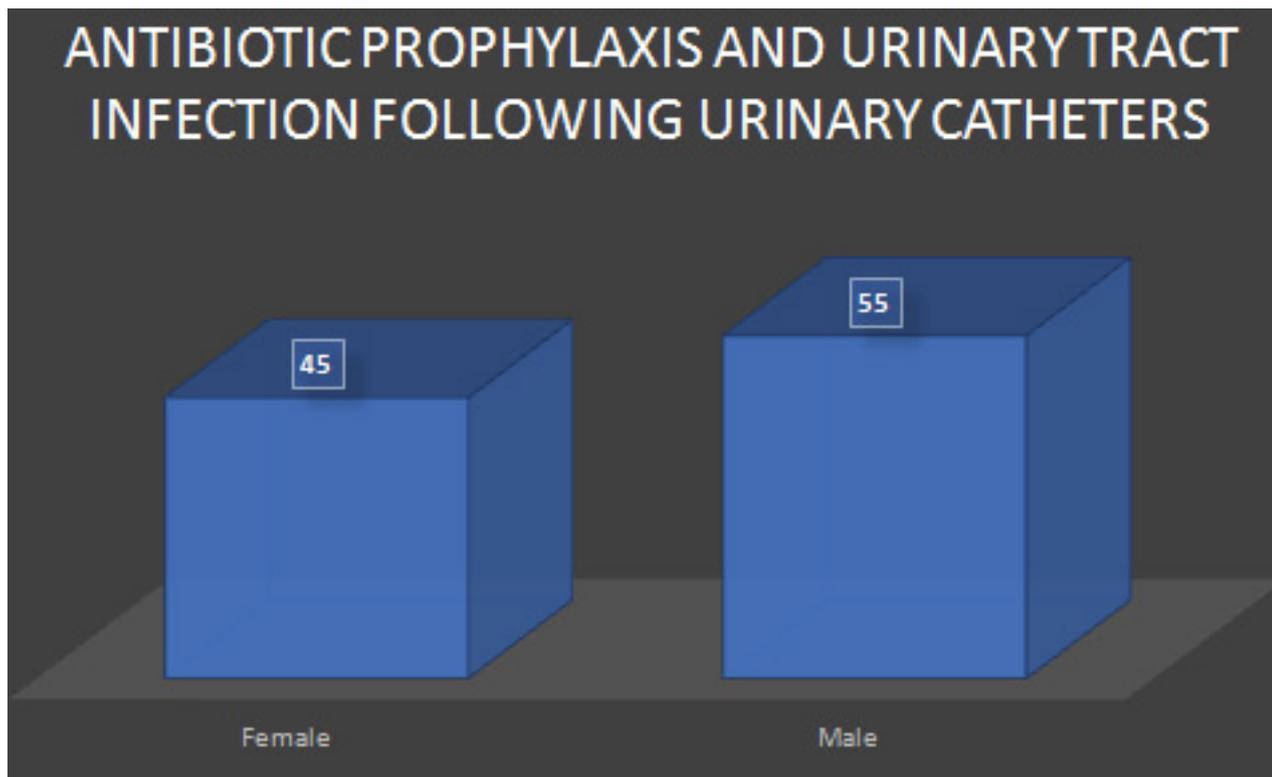
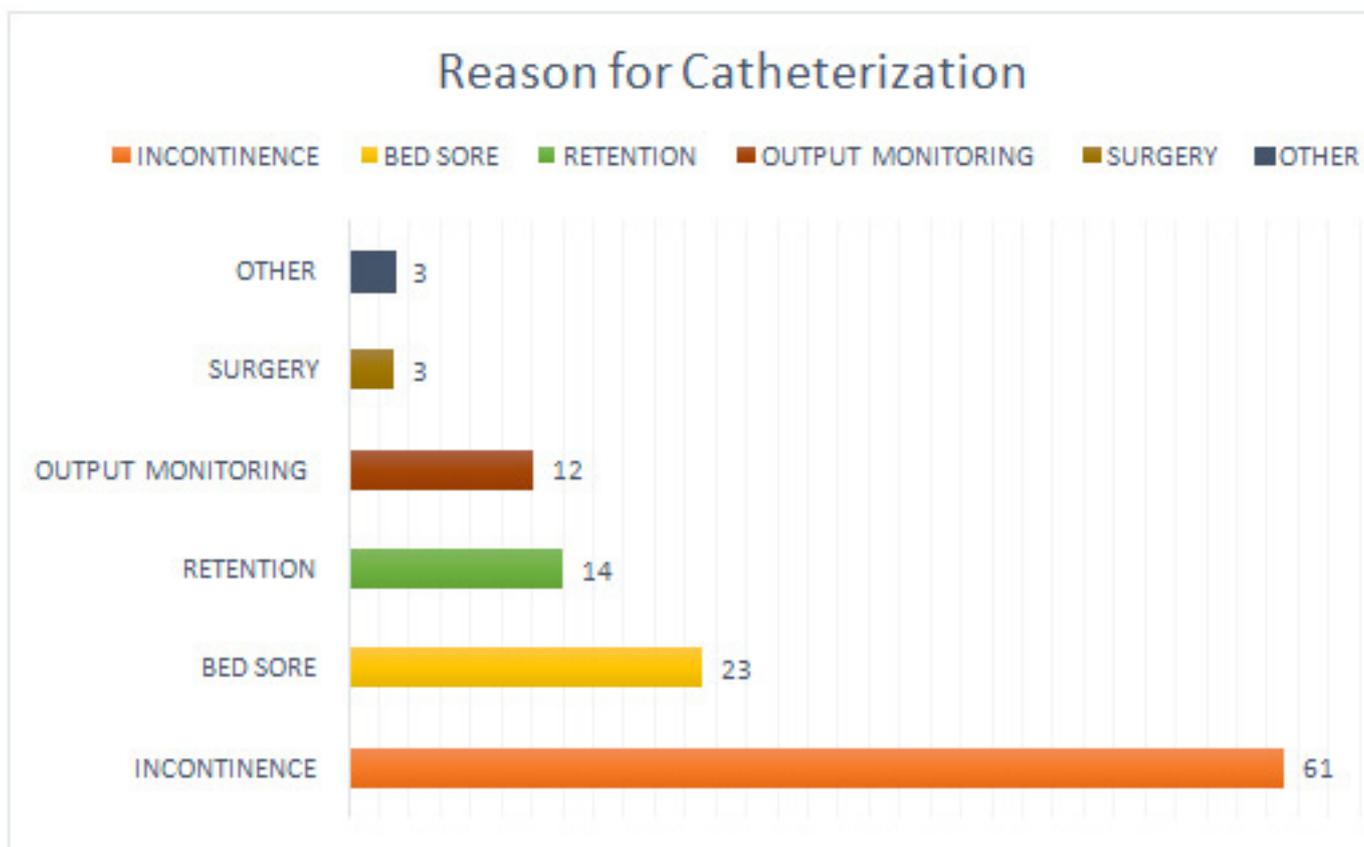
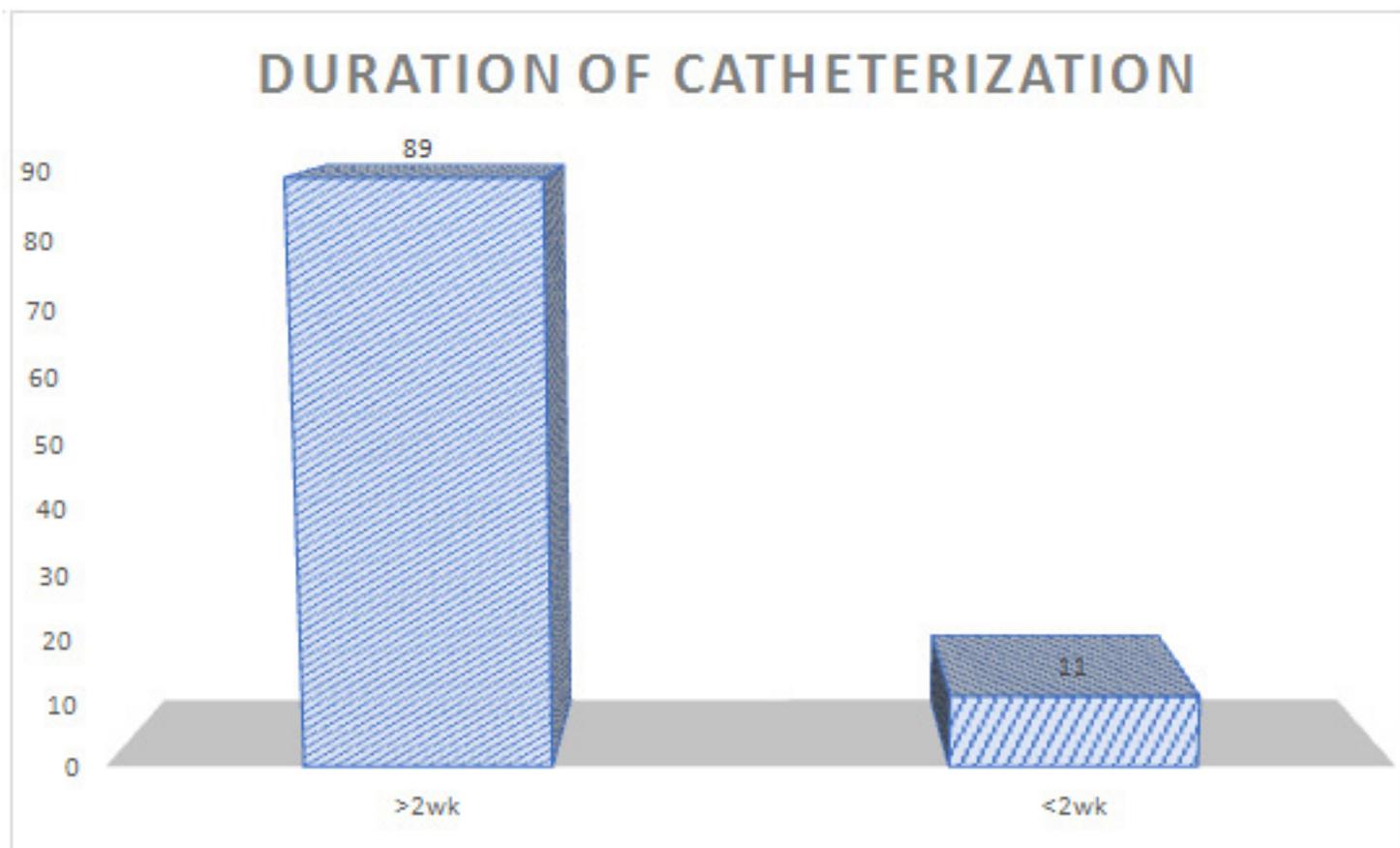


Figure 2. shows the various reasons for urinary catheterization.



The most common reason for catheterization is incontinence and bed sores protection.

Figure 3. shows the duration of urinary catheterization.



Most of the patients were on long term catheterization for more than 2 weeks.

Figure 4. shows the number of patients who used prophylactic antibiotics.

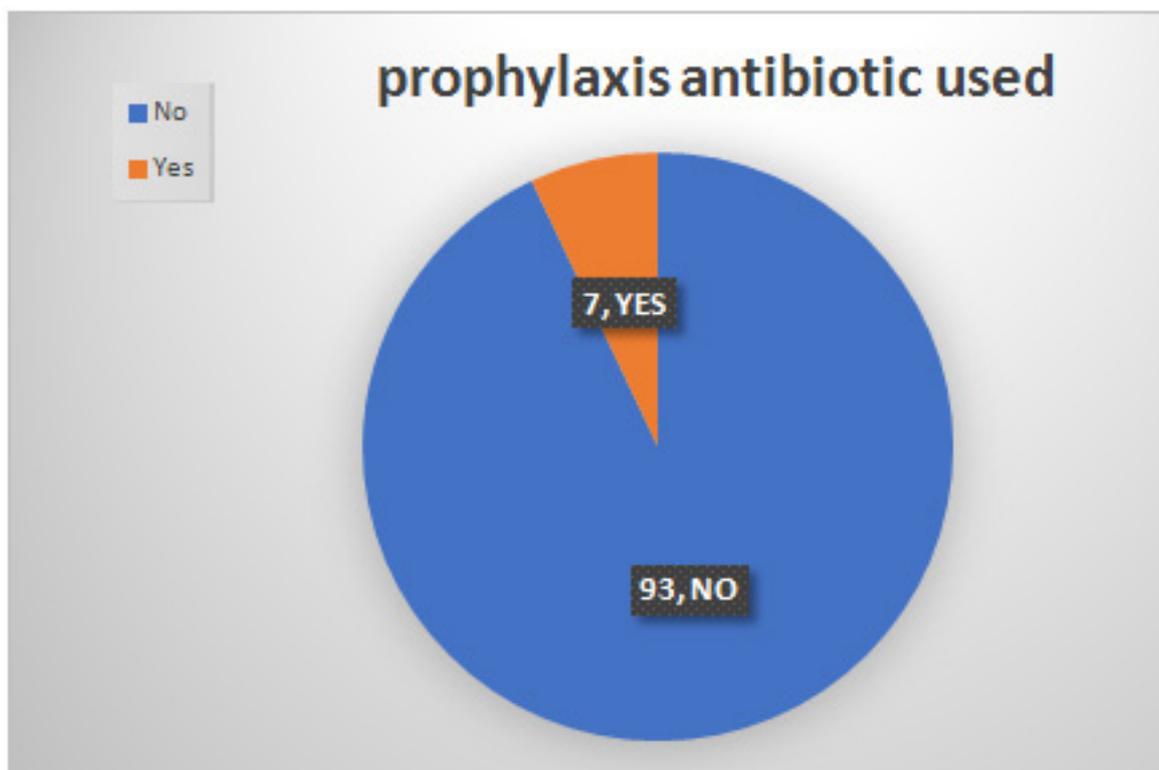
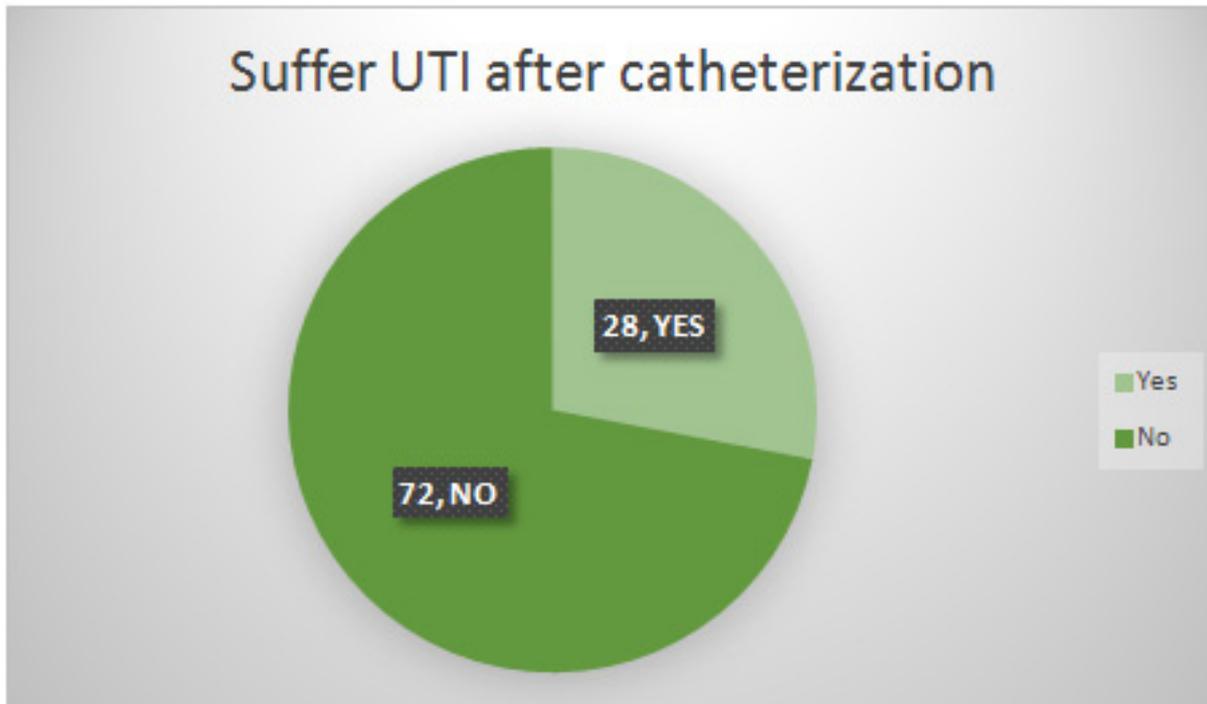


Figure 5. Illustrates the number of patients who suffered UTI after insertion of catheterization in the study.



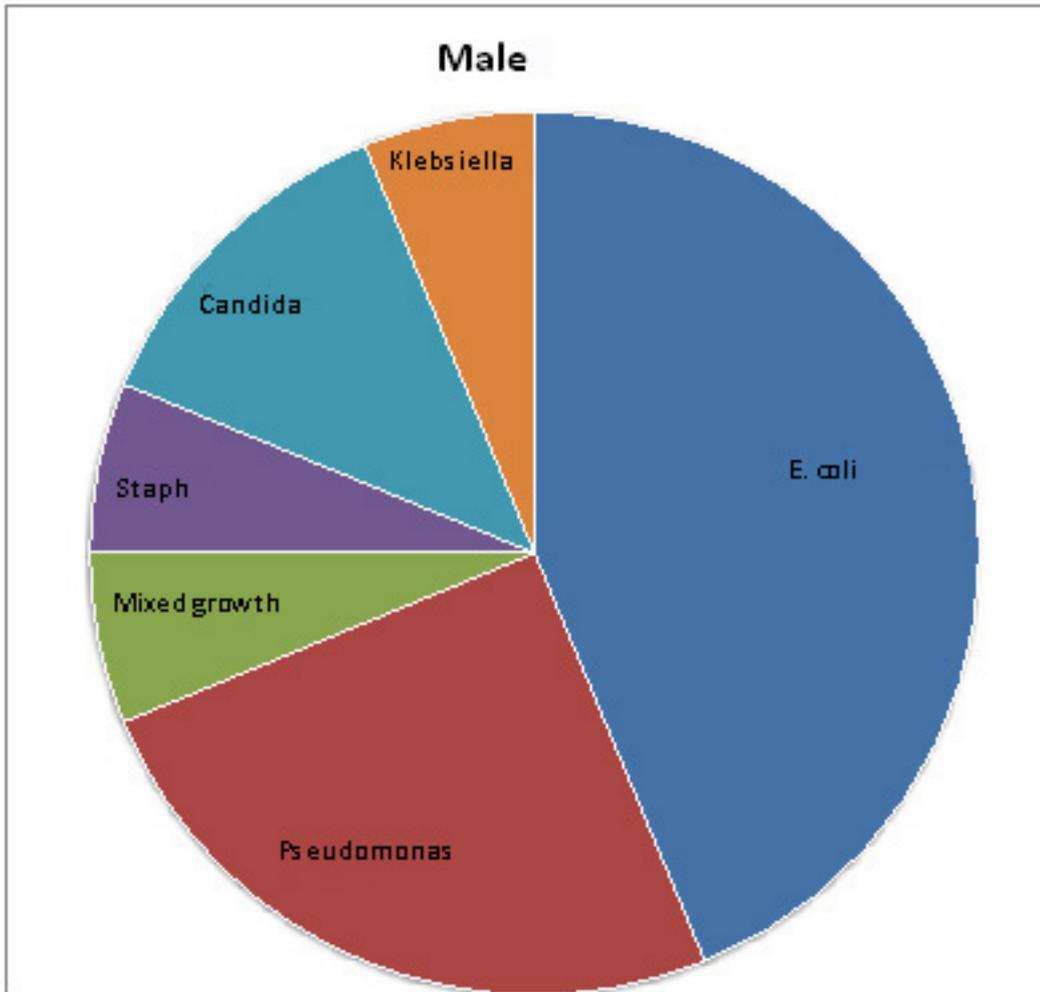
Most of the patients who suffered UTI were catheterized for a prolonged period (more than 2 weeks) which is also illustrated in Figures 7 and 9.

Table 1. Illustrates male and female elderly patients who developed UTI after insertion of urinary catheter.

Number	Male	Female	Prophylaxix	> 2 weeks	< 2 weeks	Organism
1	yes		yes	yes		E Coli
2		yes	yes	yes		E Coli
3	yes		yes	yes		E Coli
4	yes		No		yes	Pseudomonas
5		yes	No		yes	E Coli
6		yes	No		yes	Mixed growth
7		yes	No	yes		E Coli
8	yes		No	yes		E Coli
9		yes	No	yes		E Coli
10		yes	No	yes		Citrobacter F
11	yes		No	yes		Pseudomonas
12	yes		No	yes		Staph+Pseudomona
13		yes	No	yes		Proteus+Ecoli
14	yes		No	yes		Candida
15		yes	No	yes		Mixed growth
16		yes	No	yes		Pseudomonas
17	yes		No	yes		Pseudomonas
18	yes		No	yes		E Coli
19	yes		No	yes		Candida
20	yes		No	yes		E Coli
21	yes		No	yes		Mixed growth
22	yes		No	yes		Klebsiella
23		yes	No	yes		Enterobacter
24		yes	No	yes		E Coli
25		yes	No	yes		Candida
26	yes		No	yes		E Coli
27	yes		No	yes		E Coli
28		yes	No	yes		Proteus+Ecoli

It also showed the duration of catheterization and type of organism found in urine culture.

Figure 6. Illustrates the UTI causative organisms in male patients.



Figures 6 and 8 show the causative organisms of UTI in catheterized patients.

It shows E-Coli as the main cause in both males and females.

3 patients out of 28 have developed UTI even after receiving antibiotics prophylaxis.

Figure 7. Shows the duration of urinary catheterization in male patients who developed UTI.

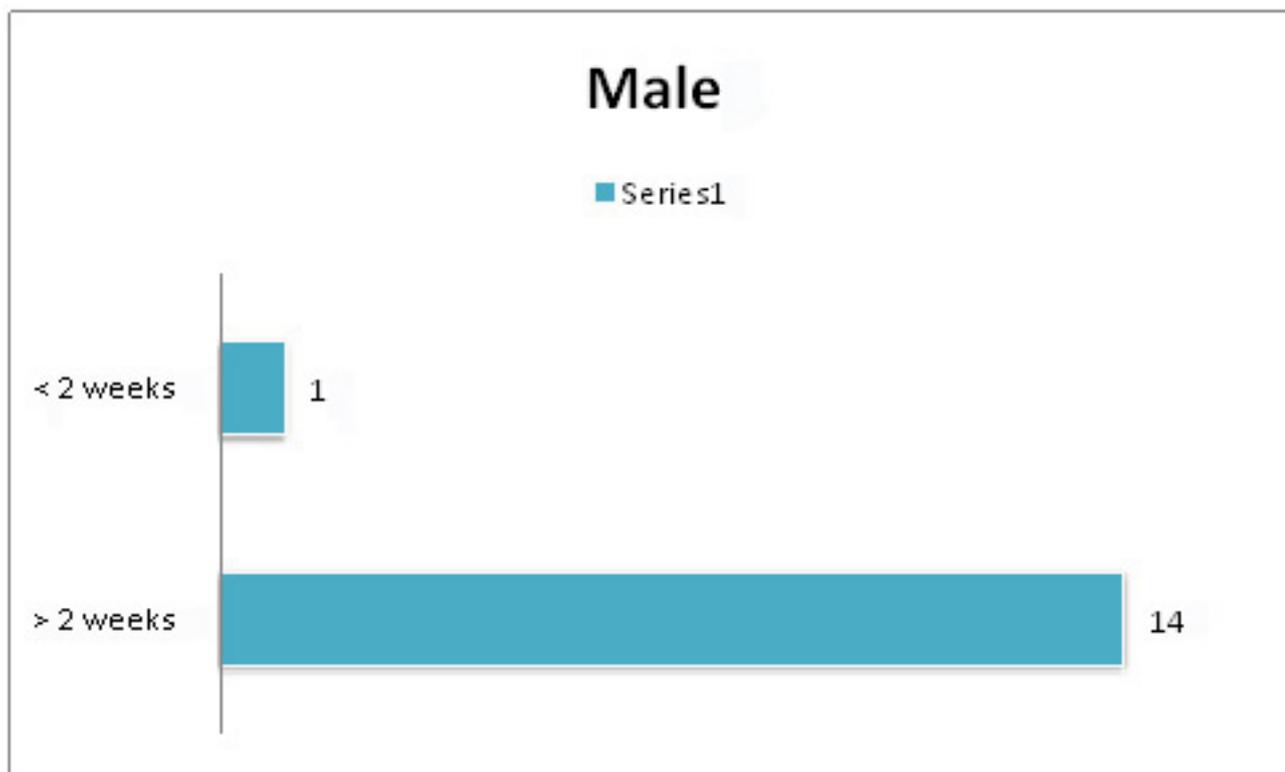


Figure 8. Shows the causative organisms in female patients who developed UTI.

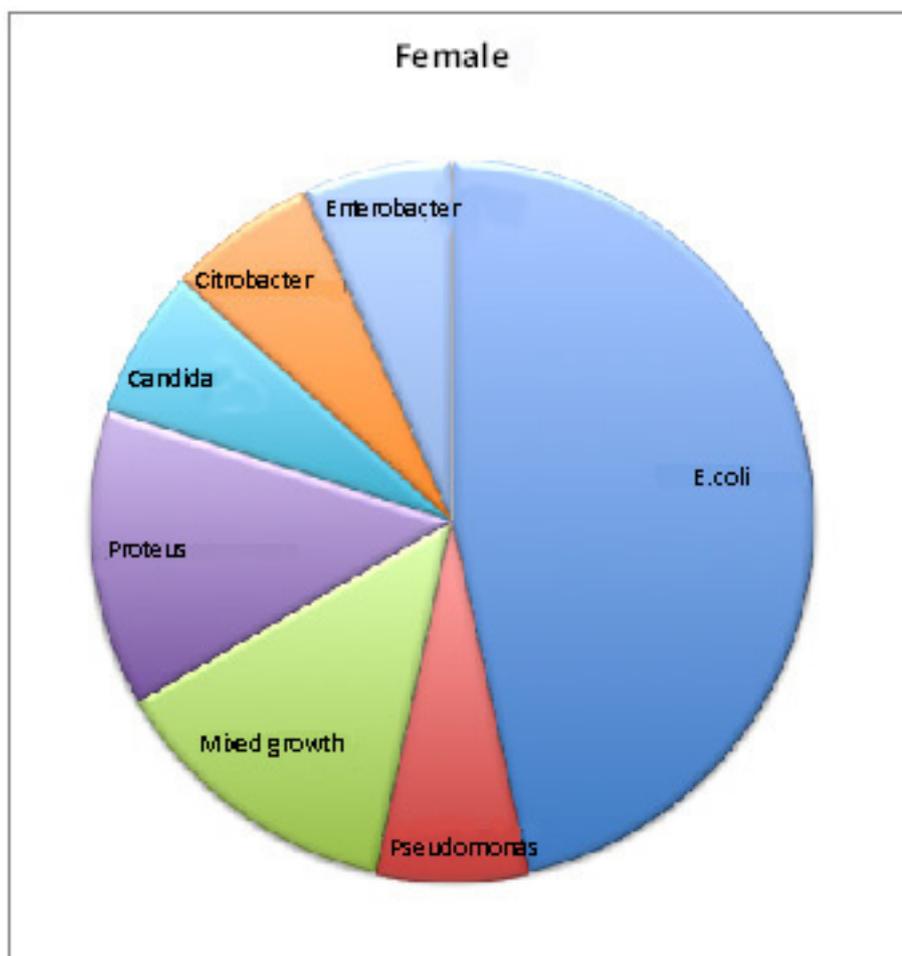


Figure 9. Shows the duration of urinary catheterization in female patients with UTI.

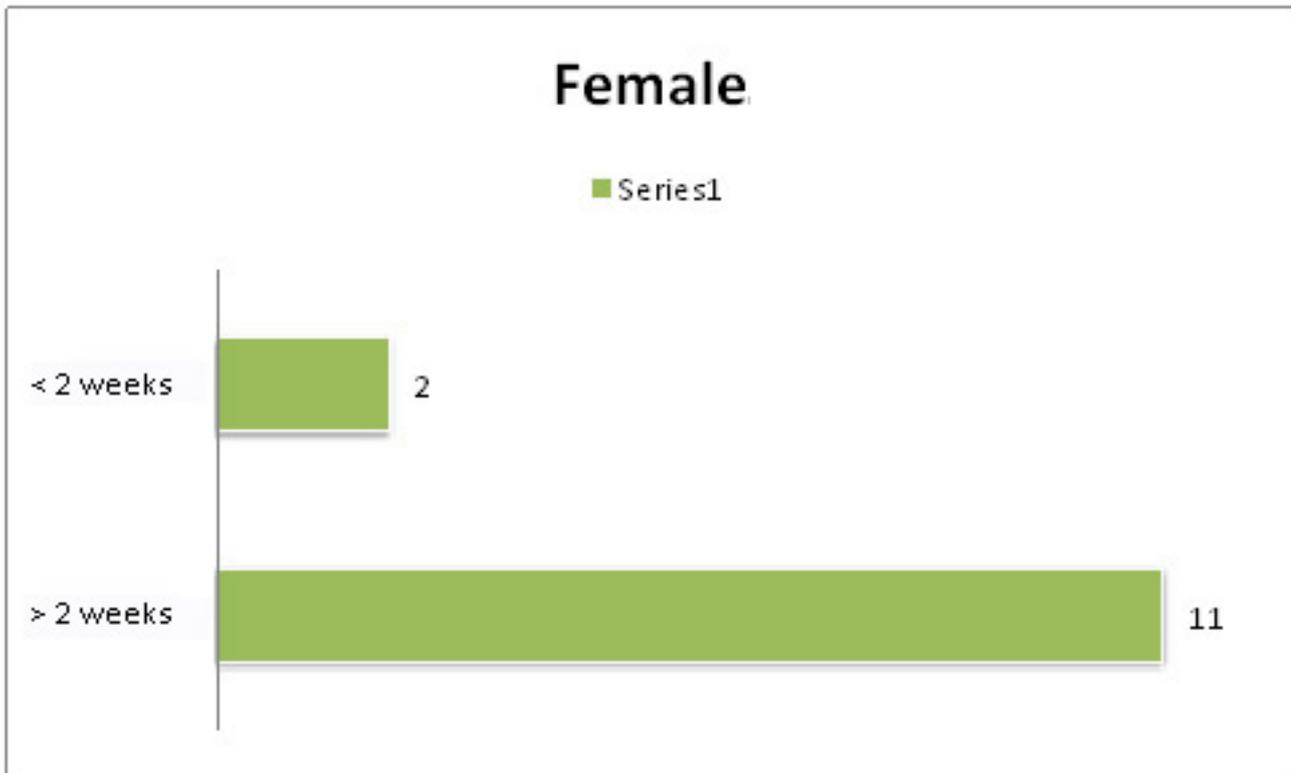
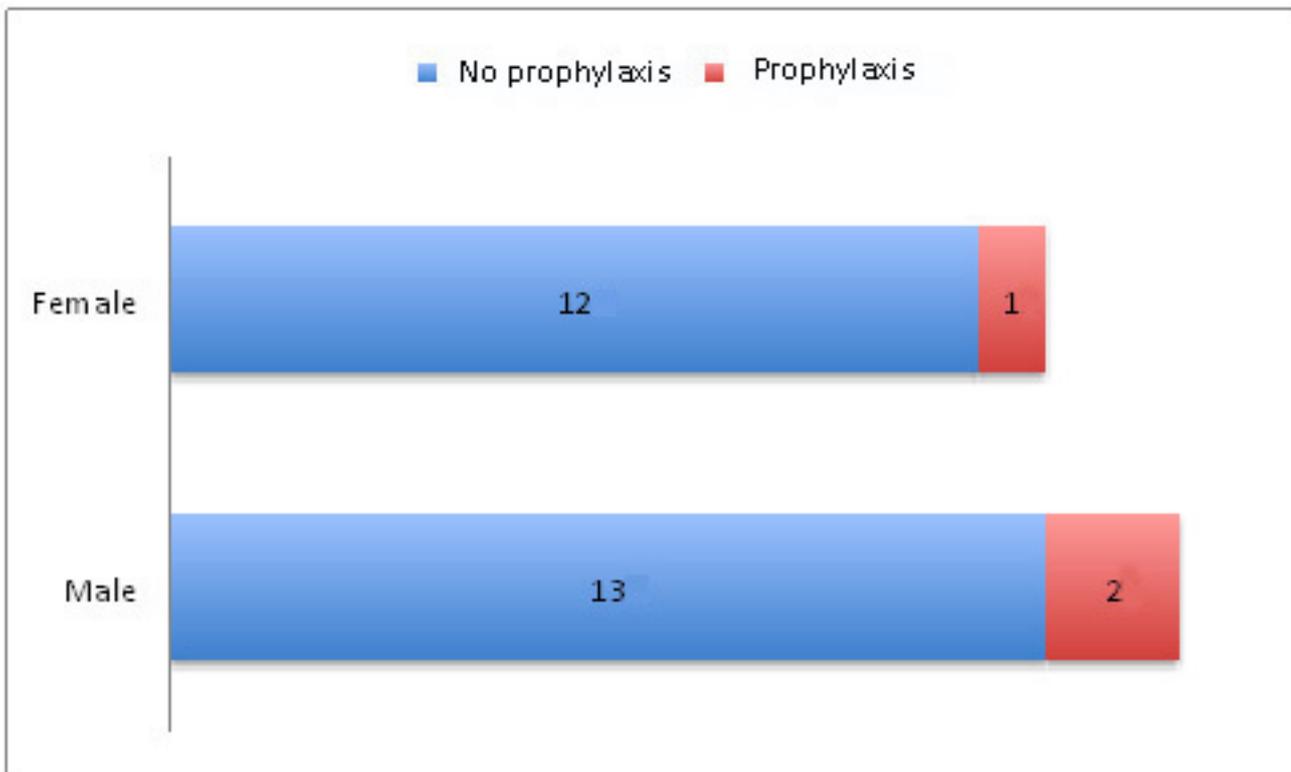


Figure 10. Shows number of patients who developed UTI with or without antibiotics prophylaxis.



Summary

Urinary catheterization is a common procedure in the elderly population especially in long term facilities.

Urinary tract infection is a common disease in the elderly.

The catheterized patients are prone to develop UTI especially with long term catheterization.
e.g. prolonged catheterization more than 2 weeks.

Prophylactic antibiotic use is not necessary to prevent UTI in case of catheter insertion in elderly.

Bacterial colonization is common in catheterized patients and this can lead to bacteriuria UTI and bacteremia.

UTI can be prevented if aseptic technique is used while inserting urinary catheter then followed with proper hygiene.

The most common organisms infecting urinary tract in catheterized patients are E-Coli, pseudomonas and candida albicans.

Strategies to decrease UTI during catheterization

1. Aseptic technique during insertion and removal.
2. Daily catheter care e.g. cleans the skin around the tube.
3. Short term catheterization.
4. Remove the urinary catheter if no clear indication.
5. Proper regular urine bag emptying.
6. Prevent the urinary catheter kinking.
7. Keep the urine collecting bag below the level of the bladder.
8. Proper hand hygiene.
9. Replace the urine catheter regularly every month.