Hospital acquired urinary tract infections

Thesis

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٢٠٠٥

سنريهم آياتنا في الآفاق و في أنفسهم

حتى يتبين لهم انه الحق أولم يكف

بربك أنه على كل شئ شهيد

صدق الله العظيم

فصلت (٥٣)

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Abbreviations

ACB	Antibody coated bacteria
ASB	Asymptomatic bacteriuria
CAUTI	Catheter associated urinary tract infection

CFU	Colony forming unit
DMSA	Dimercapto-succinic acid
HAUTIs	Hospital acquired urinary tract infections
NUTIs	Nosocomial urinary tract infections
RUTI	Recurrent urinary tract infection
SCI	Spinal cord injury
SMX	Sulfamethoxazole
TMP	Trimethoprim
UTIs	Urinary tract infections

Contents

Introduction & Aim of work

Introduction

Urinary tract infections are considered to be the most common bacterial infection and is difficult to accurately asses the incidence of UTIs, because

they are not reportable diseases and also that accurate diagnosis depends on both the presence of symptoms and a positive urine culture, although in most outpatient settings this diagnosis is made without the benefit of culture. Women are significantly more likely to experience UTI than men. **(Foxman, ٢٠٠٢)**

Hospital-acquired infections represent a major source of morbidity in hospitalized patients, accounting for about ١٠ % of all hospital patients, the most commonly affected site is the urinary tract accounting for ٢٠ %-٣٠ % of all hospital acquired infection. **(Haley, ١٩٨٥)**

Hospital acquired urinary tract infections are almost exclusively complicated urinary tract infections. **(Wagenlehner and Naber ٢٠٠٠)**

A prospective case control study on six acute wards of a busy English Teaching Hospital to assess risk factors for hospital acquired urinary tract infections revealed that: female sex, increased length of stay, elective admission, surgical operation and trans-urethral and intermittent catheterization were all significant factors for hospital acquired urinary tract infections. **(Nguyen-Van-Tam, et al ١٩٩٩)**

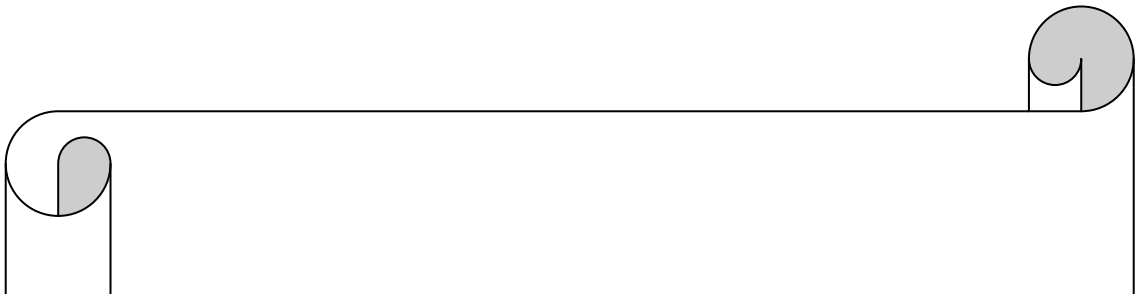
Aim of the work

١. To detect the incidence of hospital-acquired urinary tract infections among all patients admitted to the hospital during a period for ٤ months.

٢. To detect the incidence of the hospital-acquired urinary tract infections in various departments of the hospital separately.

٣. To determine the risk factors for hospital acquired urinary tract infection

٤. For critical appraisal of current management protocols in these different departments.



Review of literature

I. Introduction and definitions

Urinary tract infections "UTIs" are common bacterial infections, particularly in women. **(Nicolle ٢٠٠٢)**

UTIs are a common cause of morbidity and can lead to significant mortality. Careful diagnosis and treatment result in successful resolution of infections in most instances. **(Schaeffer, ٢٠٠٢)**

Urinary tract infections usually classified by the site of infection (the bladder [cystitis], kidney [pyelonephritis], or urine [bacteriuria]), UTI can be asymptomatic or symptomatic, characterized by a wide spectrum of symptoms ranging from mild irritative voiding to bacteremia, sepsis, or even death. **(Foxman, ٢٠٠٢)**

Definitions

Urinary tract infection "U T I":

Is a broad term that encompasses both asymptomatic microbial colonization of the urine and symptomatic infection with microbial invasion and inflammation of urinary tract structures. **(Kunin, ٢٠٠٠)**

Normally the urinary tract is sterile, bacteria are found for a short distance only about one centimeter within the urethral meatus in both sexes , but all the rest should remain free of bacteria and even if bacteria are introduced into a perfectly normal urinary tract, they will be spontaneously eradicated in at most a few days. **(Kamel, ١٩٨٠)**

Bacteriuria :

Is the presence of bacteria in the urine, which is normally free of bacteria. **(Schaeffer, ٢٠٠٢)**

Asymptomatic bacteriuria:

Is bacteriuria in the absence of any subjective symptoms of urinary infection. In females, two voided urine samples with at least 10^5 CFU / ml or a single specimen obtained by catheterization or suprapubic aspiration are required to diagnose asymptomatic bacteriuria . In men only one urine culture is necessary. **(Bryanc, ١٩٨٤)**

Pyuria :

Is the presence of white blood cells in urine, and is generally indicative of an inflammatory response of the urothelium to bacterial invasion.

** Bacteriuria without pyuria indicates bacterial colonization rather than infection.

** Pyuria without bacteriuria warrants evaluation for tuberculosis, stones or cancer.

Uncomplicated U T I:

This term is used to describe an infection in a healthy patient with a structurally normal urinary tract.

Complicated U T I :

This term describes an infection in a patient who is compromised and / or has a urinary tract with a structural or functional abnormality that would increase the chance for acquiring infection and / or reduce the efficacy of therapy.

Recurrent infections:

Are due to either re-infection or bacterial persistence.

Re-infection:

Is recurrent infection with different bacteria from outside the urinary tract. .

Bacterial persistence "relapse":

Refers to recurrent U T I caused by the same bacteria from a focus within the urinary tract, such as infection stone or prostate.

Prophylactic antimicrobial therapy:

Is the prevention of re-infections of the urinary tract by administration of antimicrobial drugs.

Suppressive antimicrobial therapy:

Is the suppressive of a focus of bacterial persistence that cannot be eradicated.

Cystitis :

Is inflammation of the bladder, whether used a histologic, bacteriologic, or cystoscopic description, or a clinical syndrome that is usually accompanied by an abrupt onset of dysuria, increased frequency, urgency, and supra-pubic pain .

Urethritis :

Refers to inflammation of the urethra.

Acute pyelonephritis :

Is a clinical syndrome of chills, fever and flank pain that is accompanied by bacteriuria and pyuria, a combination that is reasonably specific for an acute bacterial infection of the kidney.
(Schaeffer, ٢٠٠٢)

Chronic pyelonephritis :

Refers to the pathologic and radiologic findings of chronic cortical scarring, tubulo-interstitial damage, and deformity of the underlying calyx. Chronic pyelonephritis may be active, with persistent infection, or inactive with focal sterile scars of a past infection. **(Kunin, ٢٠٠٠)**

Reflux nephropathy :

The association of the small , scarred , clubbed kidney with vesicoureteric reflux " VUR" . **(Schaeffer ,٢٠٠٢)**

II. Epidemiology

(Incidence – morbidity -economic cost)

UTIs account for more than ٧ million visits to physicians' offices and necessitate or complicate over ١ million hospital admissions in the United States annually. **(Hooton and Stamm , ١٩٩٧)**

UTIs are more common in women than in men except in neonatal period, they account for ١.٢ % of all office visits by women and ٠.٦ % of all office visits by men. **(Schappert , ١٩٩٩)**

Although every one is susceptible to UTI, there are specific sub-populations that are at increased risk of UTI, including infants, pregnant women , the elderly , patients with spinal cord injuries and / or catheters , patients with diabetes, multiple sclerosis or acquired immune deficiency syndrome, and patients with underlying urologic abnormalities. **(Foxman, ٢٠٠٢)**

(A) Incidence of U T I

١- Symptomatic U T I:

Is very common among sexually active women and far more common among women than men . **(Foxman, et al. ٢٠٠٠)**

an estimated ١ in ٣ women will have at least one UTI diagnosed by a clinician requiring anti-microbial treatment by the age of ٢٤ years and ٤٠ % to ٥٠% of women will experience at least one UTI during their life time. **(Foxman, et al. ٢٠٠٠)**

A wide range of factors have been identified that can increase susceptibility to UTI. Among the specific genetic factors known to increase susceptibility is non secretor status or ABO blood- group antigens. **(Sheinfeld, et al. ١٩٨٩)**

Biologic factors that have been identified include congenital abnormalities, the presence of a urinary obstruction, and a prior history of UTI. **(Foxman, ٢٠٠٢)**

Modifiable behavioral risk factors include the use of diaphragms, condoms, and / or spermicides for contraception, and frequency of sexual intercourse among pre-menopausal women. **(Scholes et al., ٢٠٠٠)**

Post coital prophylaxis can minimize recurrent urinary tract infection "RUTI" among susceptible women. Estrogen deficiency has been associated with an increased risk of UTI, and the post menopausal use of intravaginal estriol cream can reduce the risk of recurring RUTI. **(Raz and Stamm, ١٩٩٣)**

Women of all ages are at increased risk of U T I after antimicrobial use. **(Foxman et al., ٢٠٠٠)**

٢- Asymptomatic bacteriuria "ASB":

The overall prevalence of ASB among the general population is

estimated at ٣.٥ % and the prevalence increases with age in a linear trend. **(Evans et al., ١٩٩٥)**.

Other risk factors for ASB include parity, diabetes in women, a history of UTI and lower education. **(Pastore et al., ١٩٩٩)**