



## ARTICLE REVIEW

### **Incidence of urinary tract infections in hospitalized patients. systematic review**

Incidencia de infecciones del tracto urinario en pacientes hospitalizados. revisión sistemática

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#### **ABSTRACT**

**Introduction:** it is crucial to understand the epidemiology, causes, risk factors, clinical implications, diagnostic methods, treatments and tests associated with UTI in hospitalized patients.

**Objective:** to evaluate the incidence of urinary tract infections in hospitalized patients through epidemiological analysis of clinical data, with the purpose of developing effective preventive strategies.

**Methods:** to conduct this article, PRISMA methodology was used to examine studies published between 2018 and 2023. Twenty-two scientific articles obtained through a digital search in various databases were reviewed: Pubmed, Scopus, Scielo, Journals through the review of urinary tract infections in hospitalized patients, obtained from reliable sources offering a global, objective and transparent view of the information.

**Results:** comprehensive review of urinary tract infections in hospitalized patients, addressing various aspects such as epidemiology, risk factors, clinical manifestations, diagnosis, treatment and management of associated complications. The importance of understanding the epidemiology and reducing morbidity and mortality is emphasized.

**Conclusions:** urinary tract infections are a significant concern in hospital settings, with a considerable incidence that can vary according to several factors, such as the presence of invasive devices and antibiotic exposure.

**Keywords:** Diagnosis; Urinary Tract Infections; Hospital Patients.

## RESUMEN

**Introducción:** es crucial comprender la epidemiología, las causas, los factores de riesgo, las implicaciones clínicas, los métodos de diagnóstico, los tratamientos y los exámenes asociados con las ITU en pacientes hospitalizado.

**Objetivo:** evaluar la incidencia de infecciones del tracto urinario en pacientes hospitalizados mediante análisis epidemiológico de datos clínicos, con el propósito de desarrollar estrategias preventivas eficaces.

**Métodos:** para la realización de este artículo se empleó la metodología PRISMA para examinar los estudios publicados entre 2018 y 2023. Se revisaron 22 artículos científicos obtenidos a través de una búsqueda digital en diversas bases de datos: Pubmed, Scopus, Scielo, Journals a través de la revisión de las infecciones del tracto urinario en pacientes hospitalizados, obtenidos de fuentes confiables que ofrece una visión global, objetiva y transparente de la información.

**Resultados:** la revisión exhaustiva de las infecciones del tracto urinario en pacientes hospitalizados, abordando diversos aspectos como epidemiología, factores de riesgo, manifestaciones clínicas, diagnóstico, tratamiento y manejo de complicaciones asociadas. Se destaca la importancia de comprender la epidemiología y reducir la morbilidad y la mortalidad.

**Conclusiones:** las infecciones del tracto urinario son una preocupación significativa en entornos hospitalarios, con una incidencia considerable que puede variar según diversos factores, como la presencia de dispositivos invasivos y la exposición a antibióticos.

**Palabras Claves:** Diagnóstico; Infecciones del Tracto Urinario; Pacientes Hospitalarios.

## INTRODUCTION

Urinary tract infections (UTIs) are a common complication in hospitalized patients that can result in serious health consequences and increase the workload on healthcare systems. The incidence of UTIs in hospital settings can vary widely and is influenced by a number of factors including patient age, length of hospitalization, presence of invasive devices such as urinary catheters, and exposure to broad-spectrum antibiotics.<sup>(1)</sup>

Understanding the epidemiology, causes, risk factors, clinical implications, diagnostic methods, treatments, and tests associated with UTIs in hospitalized patients is crucial to improve medical care and reduce morbidity and mortality associated with this condition.<sup>(2)</sup>

UTIs are one of the most common nosocomial infections, accounting for approximately 20% of all hospital-acquired infections. The incidence of UTI varies depending on the population studied and the hospital setting, but it is estimated that up to 10% of hospitalized patients may develop a UTI during their hospital stay.<sup>(3)</sup>

UTIs are defined as the presence of pathogenic microorganisms in any part of the urinary system, including the urethra, bladder, ureters and kidneys. These infections can be classified according to location and severity, the most common being cystitis (involving the bladder) and pyelonephritis (involving the kidneys).<sup>(4)</sup>

The causes of urinary tract infections in hospitalized patients are multifactorial. Bacterial colonization of the urinary tract is the main mechanism, and factors such as the presence of urinary catheters, invasive procedures, immunosuppression, prolonged hospitalization, and exposure to antibiotic-resistant bacteria may increase the risk of infection.<sup>(5)</sup>

### Classification

Acute recurrent cystitis in women:

Reinfection is the recurrence after the eradication of the bacteria causing the first infection.

Relapse is the recurrence when the bacteria causing the first infection persisted in the urinary tract despite treatment.<sup>(6)</sup>

The vast majority of recurrence cases in healthy women are due to reinfections, sometimes by the same organism persisting in the rectal or perineal flora. Behavioral preventive measures are usually recommended, such as perineal hygiene "from front to back", abundant water intake, or urination after intercourse. However, the usefulness of these measures has little support in studies.<sup>(7)</sup>

In postmenopausal women, topical intravaginal estrogen has been used to promote tissue trophism and normalization of vaginal flora. The development of lactobacillus antagonizes perineal colonization by uropathogens.<sup>(8)</sup>

UTIs in men become more frequent with the appearance of prostatic abnormalities. They are rare in young men with normal urinary systems, but can occur. These "uncomplicated" cystitis in men are associated with anal sex and sexual partners with vaginal colonization with uropathogens. They require urine culture and can be treated with seven to 10 days of ciprofloxacin. Complicated UTIs are typically associated with prostatic obstruction. The prostate can become infected and become a reservoir for bacteria. This requires prolonged courses of antibiotics with good penetration into the prostatic tissue (ciprofloxacin or cotrimoxazole) to eradicate this focus.<sup>(9)</sup>

Urinary tract infections in the elderly are generally considered to be complicated by prostate disorders, bladder dysfunction, or others. However, many postmenopausal women may have uncomplicated UTIs.

In acute pyelonephritis, the typical clinical picture includes fever and lumbar pain. Symptoms of lower infection may or may not be present, and these may precede the fever. Nausea and vomiting may be present. On physical examination, there is pain on palpation or lumbar fist-percussion. In laboratory tests, apart from urine abnormalities, there is leukocytosis and elevated C-reactive protein. Sometimes the pain is abdominal (not lumbar) and the picture may simulate other abdominal septic conditions.<sup>(10)</sup>

There are several risk factors associated with UTIs in hospitalized patients. These include the presence of urinary devices such as catheters, advanced age, female sex, diabetes, urinary obstructions, immunosuppression, and prolonged hospitalization.<sup>(11)</sup>

Management of this infection is based primarily on prevention. Urinary catheters should be used when strictly indicated. "Indwelling" catheters should be replaced periodically because the appearance of biofilms favors bacterial development. Hospital-acquired UTIs can have serious clinical consequences, including bacteremia, sepsis, acute renal failure, and increased mortality. In addition, these infections can prolong hospital stay, increase health care costs, and contribute to the development of antimicrobial resistance.<sup>(12)</sup>

Diagnosis of a hospital-acquired UTI is usually made by urinalysis, which can reveal the presence of bacteria, leukocytes, and blood cells. Renal ultrasound and CT scan can be helpful in assessing the severity of the infection and detecting complications such as pyelonephritis.<sup>(13)</sup>

In the presence of a compatible clinical picture, the diagnosis is made by a urinalysis and a urine culture. Pyuria is the presence of more than five leukocytes per field in the sediment or more than 10 leukocytes per mm<sup>3</sup> of urine. A positive dipstick test for the presence of leukocyte esterase or nitrites is consistent with UTI. However, urinalysis is only presumptive of UTI. So-called sterile pyuria, or pyuria with a negative urine culture, may be due to noninfectious inflammation (acute interstitial nephritis), acute urethritis due to sexually transmitted diseases, or tuberculosis of the urinary system.<sup>(14)</sup>

A quantitative urine culture is performed to statistically differentiate a UTI from contamination that can be caused by bacteria from the urethra. In UTI, there are usually more than 10<sup>5</sup> bacteria per mL of urine.<sup>(6)</sup> There are cases in which this concentration is lower, and a positive urine culture with more than 10<sup>3</sup> uropathogenic bacteria per mL is also considered in the presence of UTI symptoms. The urine sample should be from a "second stream", catheterization or suprapubic puncture. All of these techniques minimize contamination of the sample.<sup>(15)</sup>

Asymptomatic bacteriuria is the presence of a positive urine culture in the absence of clinical manifestations of urinary tract infection. The prevalence of bacteriuria is low in healthy individuals. However, the prevalence of bacteriuria is high in some groups: elderly women (20 %), institutionalized elderly (up to 50 %) and users of permanent urinary catheters (100 %).<sup>(8)</sup> Asymptomatic bacteriuria should not be treated. Treatment does not reduce mortality or the subsequent appearance of urinary symptoms.

Treatment can be done on an outpatient basis, typically with oral ciprofloxacin, analgesia, and oral hydration, unless there is an indication for hospitalization.<sup>(16)</sup>

Ceftriaxone is a treatment with the appropriate spectrum of antimicrobial activity for patients with an indication for hospitalization. Enterococcal pyelonephritis requires ampicillin. Aminoglycosides are used less because of their potential toxicity. Generally, patients can be switched to oral therapy after one or two days and complete treatment on an outpatient basis. The total duration of the antibiotic is 10 to 14 days. Patients treated with ciprofloxacin and whose symptoms have subsequently resolved are treated for 10 days. It is not necessary to take post-treatment urine cultures, unless symptoms recur.<sup>(17)</sup>

Antibiotic prophylaxis is effective. It is indicated in women with at least 3 UTIs in a 1-year period. Alternatives are daily or postcoital use of antibiotics. The latter when the patient notices a temporal relationship with sexual activity. In some cases the patient is instructed to start a three-day course of antibiotics as soon as symptoms begin.<sup>(18)</sup>

Treatment of hospital-acquired UTIs usually involves the use of antibiotics, which are selected based on the sensitivity of the identified pathogen and the severity of the infection. In addition, additional measures such as removal of urinary catheters and management of associated complications may be required.

It is essential to encourage early mobility and adequate fluid intake to promote regular bladder emptying and prevent urinary stasis, which can promote bacterial colonization. Evidence-based protocols for insertion and management of urinary catheters should be implemented, minimizing their use when not strictly necessary and removing them as soon as possible to reduce the risk of catheter-associated infections.

## METHODS

In this systematic review of the scientific literature, the PRISMA methodology was used to examine studies published between 2018 and 2023. 21 scientific articles were reviewed, obtained through an electronic search in various databases: Pubmed, Scopus, Scielo, Journals, and were selected using the following criteria.

### Inclusion Criteria.

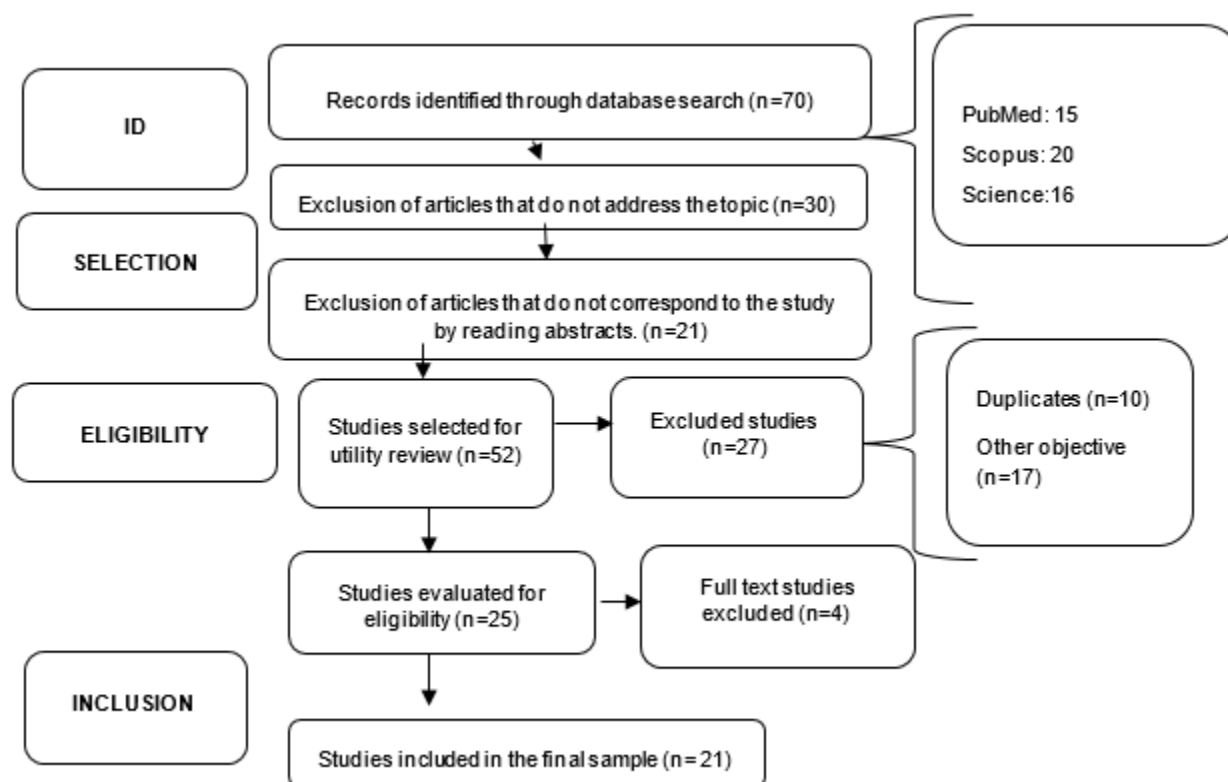
- a) Articles published within the period: 2018-2023.
- b) Articles with access to their summary or full content.
- c) Articles published in high-impact scientific journals.
- d) Articles containing information related to the present research topic.
- e) Articles written in English or Spanish.

### Exclusion criteria.

- a) Articles that do not allow access to their content
- b) Articles that are not relevant or useful for the research topic.
- c) Articles published outside the established period (2018-2023).

## DEVELOPMENT

The results are presented according to the selection parameters defined in the methodology, in accordance with the stages of the PRISMA method, detailed in Figure 1.



**Fig. 1** Search flowchart for articles.

## Description of the articles used for the research

### 1. Incidence of urinary tract infection associated with bladder catheter Year 2021

**Aim:** YOThe aim of this research was to determine the incidence of urinary tract infection associated with the use of a bladder catheter.

**Information Source:** Elsevier

**Risk and bias of studies:** Descriptive study

**Methodology:** For this purpose, basic, descriptive and explanatory research was carried out.

**Sample:** The sample of this study consisted of 377 patients with nosocomial urinary tract infection.

**Summary of results:** The main results include an average age of 57,63 years, predominance of female patients (63,92 %) and with associated comorbidities (54,30 %).

**Limitations of the evidence:** An association was identified between the use of a urinary catheter and the incidence of urinary tract infection, but the study cannot establish a causal relationship due to its descriptive and explanatory design.

**Implication:** The presence of comorbidities and female sex were factors that were most frequently identified in all patients with urinary tract infection; however, their association with bladder catheterization was more frequent in male patients.

## 2. Urinary tract infection Year: 2022

**Aim:** To evaluate microbiological infections and bacterial resistance in urinary tract infections in hospitalized patients of the Service.

**Information Source:** Scielo

**Risk and bias of studies:** The study may be lacking in representativeness of the general population, as it is limited to patients hospitalized in a single medical service in a specific hospital.

**Methodology:** A retrospective, cross-sectional, descriptive observational study design was used. Data were collected through review of medical records and urine culture results of patients diagnosed with urinary tract infection.

**Sample:** The sample included 94 patients hospitalized in the Service.

**Summary of results:** *Escherichia coli* was the most commonly isolated etiologic agent (72 %), followed by *Klebsiella pneumoniae* (11 %). 57,7 % of the isolated strains were found to be extended-spectrum beta-lactamases (ESBL) producers. Overall, *E. coli* showed high rates of antibiotic resistance, especially against ciprofloxacin, levofloxacin and cephalosporins.

**Limitations of the evidence:** Retrospective design, which could have introduced biases in data collection and analysis.

**Implication:** The findings suggest the need for continued surveillance of bacterial resistance and microbiological profile in urinary tract infections in this hospital.

## 3. Microbiological profile and bacterial resistance of urinary tract infections in hospitalized patients Year (2020)

**Aim:** To determine the microbiological profile and bacterial resistance of urinary tract infections in hospitalized patients of the Medicine Service of the Edgardo Rebagliati Martins National Hospital.

**Information Source:** Scielo

**Risk and bias of studies:** Retrospective cross-sectional descriptive.

**Methodology:** Retrospective, descriptive, cross-sectional, observational study; data were collected through the review of medical records and urine culture results of patients with a definitive diagnosis of urinary tract infection in the time interval from August 1 to October 31, 2019.

**Sample:** 78 patients who met the inclusion criteria were identified.

**Summary of results:** The incidence in females predominates over males in an approximate ratio of 2:1, with an average age of 73.3 years in a range of 15 to 95 years.

**Limitations of the evidence:** The study was conducted over a three-month period in 2019. This period may not be sufficient to capture all possible seasonal variations in the prevalence of certain microorganisms and bacterial resistance patterns in UTIs.

**Implication:** Since the study is limited to a specific period, it is important for the hospital to continue monitoring bacterial resistance in UTIs in subsequent years to assess possible changes in resistance patterns over time.

## 4. Incidence of urinary tract infections in patients Year (2022)

**Aim:** To determine the incidence of urinary tract infections in hospitalized patients and to characterize the etiological agents involved.

**Information Source:** PUBMED

**Risk and bias of studies:** Selection bias may exist, as the patients included were those hospitalized in a single medical center in Caracas, Venezuela. In addition, as this is a retrospective study, there may be biases in data collection and analysis.

**Methodology:** Retrospective, cross-sectional, observational study in patients admitted during the period from September 2021 to February 2022 at the La Trinidad Teaching Medical Center, Caracas, Venezuela.

**Sample:** 180 adult patients

**Summary of results:** Of the 180 patients analyzed, 17,8 % (32 patients) presented urinary tract infection. The majority of patients with urinary tract infection were female (59,4 %). *Escherichia coli* was the main etiologic agent isolated in 59,4 % of cases.

**Limitations of the evidence:** A possible limitation of the study could be its retrospective nature, which may introduce biases in data collection and analysis.

**Implication:** These results suggest that hospitalized patients may be at increased risk of developing urinary tract infections, especially women.

## 5. Prevention of urinary tract infection in hospitalized patients associated with urinary catheters. Year (2021)

**Aim:** To analyze the literature review on the prevention of urinary tract infection associated with urinary catheters in hospitalized patients, in order to provide nursing professionals with updated and evidence-based information for the proper management of these devices and thus prevent one of the main complications in hospitals.

**Information Source:** Elsevier

**Risk and bias of studies:** Data from a prevalence study of nosocomial infections (EPINE) that may not fully represent the hospital population in other settings.

**Methodology:** The methodology consisted of a bibliographic review on the prevention of urinary tract infection associated with urinary catheters in hospitalized patients.

**Sample:** 86 individual patients, and aggregated data from epidemiological studies such as the prevalence of nosocomial infections (EPINE) study.

**Summary of results:** Urinary tract infection was found to be the third most prevalent nosocomial infection in hospitals, with a high percentage of association with the use of devices such as urinary catheters.

**Limitations of the evidence:** The main limitation is the reliance on data from a single study of prevalence of nosocomial infections (EPINE), which may not fully reflect the situation in all hospitals.

**Implication:** Implications include the need for increased attention and preventive measures aimed at reducing the incidence of catheter-associated urinary tract infections in hospitalized patients, which could lead to improved quality of care and reduced healthcare costs.

## 6. The BIP Foley bladder catheter is superior to conventional Foley in reducing catheter-related urinary tract infections in hospitalized patients. Year 2022

**Aim:** To compare the incidence of CVUTI in patients with Foley BIP versus conventional Foley catheter.

**Information Source:** PUBMED.

**Risk and bias of studies:** patients under treatment, which could introduce selection and reporting biases into the results.



**Methodology:** A clinical trial was conducted with simple randomization, following the double-blind system.

**Sample:** 140 adult patients

**Summary of results:** 140 cases with an inclusion of 125 cases and an exclusion of 15 cases (11 %). The mean age was 50 years  $\pm$  18, with 52 % men and 48 % women. The mean observed time was 10 days  $\pm$  7. An overall incidence rate of 25 UTIs per 1000 days was presented.

**Limitations of the evidence:** Exclusion of 11 % of cases, which could affect the representativeness of the sample.

**Implication:** CVUTIs are a major concern in healthcare, and reducing their incidence can improve quality of care, reduce morbidity and associated costs.

## 7. Microbiological diagnosis of urinary tract infections. YEAR 2020

**Aim:** To analyze the methods available for processing urine samples in the microbiological diagnosis of urinary tract infection (UI), including screening of negative urine samples and special procedures for cases such as prostatitis and UI due to fastidious microorganisms.

**Information Source:** Journal

**Risk and bias of studies:** Sample processing methods based on laboratory resource availability, which could influence results and their interpretation.

**Methodology:** Investigative

**Sample:** The sample consists of information and data collected from previous studies, laboratory protocols and relevant clinical guidelines on the processing of urine samples in the diagnosis of UI.

**Summary of results:** The review discusses available methods for processing urine samples, including automated systems for screening negative urine samples and special procedures for cases such as prostatitis and UTI due to fastidious organisms.

**Limitations of the evidence:** A potential limitation could be the lack of uniformity in urine sample processing methods between different laboratories, which could affect the comparability of results and the generalizability of recommendations.

**Implication:** The review highlights the importance of adequate urine sample processing in the microbiological diagnosis of UI, in order to ensure accurate results and guide appropriate patient management.

## 8. Urinary tract infection due to urinary catheter Year (2020)

**Aim:** To identify and analyze the risk factors and harmful effects associated with indwelling catheter bacteriuria, and to evaluate the possibility of implementing prevention strategies to reduce indwelling catheter-related septic episodes.

**Information Source:** Scielo

**Risk and bias of studies:** Sample adequately represents the general population of patients with indwelling catheters

**Methodology:** Comprehensive literature review

**Sample:** 70 patients with probes

**Summary of results:** A variety of risk factors would be expected to be associated with indwelling catheter bacteriuria, including length of catheter in place, catheter location, catheter material, type of infecting bacteria, health status of the urinary tract and patient, and catheter incidents and manipulations.

**Limitations of the evidence:** Possible limitation of risk factors or absence of consistent data in the literature.

**Implication:** Important for clinical practice, as it could inform the implementation of strategies to prevent infections related to indwelling catheters.

## 9. Incidence and factors risk of bacterial resistance to urinary tract infections. Year 2021

**Aim:** To characterize the etiology of urinary tract infections (UTI) in a social-health center, define the antibiotic sensitivity profile and study associations between isolated microorganisms, bacterial resistance and various clinical parameters.

**Information Source:** S copus

**Risk and bias of studies:** Retrospective clinical data collection.

**Methodology:** Prospective study of all UTIs in the Assisted Unit of a geriatric social-health center.

**Sample:** 96 adult-geriatric patients

**Summary of results:** The results showed that *Escherichia coli* and *Proteus myriabilis* were the main microorganisms isolated, with different associations with clinical parameters such as bed rest, gender, recurrence, incontinence, neurological deterioration, basic activities of daily living and medication use.

**Limitations of the evidence:** A possible limitation is the exclusion of other possible factors that could influence bacterial resistance, such as the prescription of antibiotics outside the social health centre.

**Implication:** Continuous monitoring of bacterial resistance in social-healthcare centres and the implementation of strategies to minimise the spread of resistant microorganisms, as well as the prudent use of antibiotics to prevent resistance and improve the management of UTIs in this type of geriatric population.

## 10. Incidence, determinants and impact of nosocomial urinary tract infections in patients Year 2022

**Aim:** identifying risk factors, microbiological agents causing infections and sensitivity-resistance profiles.

**Information Source:** PubMed

**Risk and bias of studies:** All cases of nosocomial infections in the Urology Department during the study period were appropriately considered.

**Methodology:** Retrospective observational study

**Sample:** 100 patients of urological service

**Summary of results:** The results showed that the NNIS and SENIC risk scores were positioned as good predictors of the risk of suffering a nosocomial UTI in the Urology Department.

**Limitations of the evidence:** Possibility of underreporting of nosocomial infection cases, lack of generalizability of results to other hospital settings, and lack of analysis of certain relevant factors that could influence the incidence of nosocomial UTIs.

**Implication:** The implications of the study include the need to implement specific preventive measures based on the results found, such as the use of the NNIS and SENIC risk scales to identify patients with a higher risk of developing nosocomial UTIs and the application of infection control measures directed at the identified risk factors and the prevalent microbiological agents in the Urology Service.

## 11. Nosocomial urinary tract infections Year 2023

**Aim:** To review the pathogenic mechanisms of nosocomial urinary tract infection related to the use of urinary catheters, as well as the adhesion and biofilm formation capacity of the microorganisms involved.

**Information Source:** Journals

**Risk and bias of studies:** Since the article focuses on a literature review and not on a specific study, bias could be related to the selection and analysis of the studies included in the review, which may influence the interpretation of the results and conclusions.

**Methodology:** This is a literature review that compiles and synthesizes relevant information on the pathogenetic mechanisms, diagnosis, treatment and preventive measures of nosocomial urinary tract infection associated with the use of urinary catheters.

**Sample:** It does not apply in this context, since this is a literature review and not an empirical study with a specific sample.

**Summary of results:** The article reviews the pathogenicity mechanisms of nosocomial urinary tract infection, the difficulty in clinical diagnosis, the choice of empirical treatment and the importance of preventive measures to reduce the incidence of these infections.

**Limitations of the evidence:** The main limitation may be the dependence on the quality and availability of the reviewed studies, as well as the lack of specific data from controlled clinical studies.

**Implication:** To understand the mechanisms of pathogenicity and the diversity of microorganisms involved in nosocomial urinary tract infection associated with the use of urinary catheters, as well as the need to stratify therapy according to the severity of the infection and to implement effective preventive measures to reduce its incidence.

## 12. Hospital-acquired urinary tract infections in patients with urinary catheters Year 2023

**Aim:** To analyze the characteristics of nosocomial urinary tract infections associated with urinary catheters in a Urology Department, including incidence, risk factors, microbiological patterns and resistance rates of isolated germs.

**Information Source:** Scielo

**Risk and bias of studies:** Selection may have been present due to the prospective nature of the study and possible exclusion of patients who did not meet certain inclusion criteria.

**Methodology:** The study was prospective and analyzed the incidence of nosocomial infections associated with urinary diversion catheters.

**Sample:** The sample consisted of 2283 patients with urinary catheters.

**Summary of results:** The incidence of nosocomial urinary tract infections associated with urinary catheters was 8,2 %. Significant risk factors were identified, such as the presence of a urinary catheter prior to admission and the performance of urological surgical procedures during hospitalization.

**Limitations of the evidence:** A potential limitation of the study could be the lack of generalizability of the results to other populations or hospital settings due to the specific nature of the Urology Department studied.

**Implication:** Implications of the study include the importance of identifying and addressing risk factors for catheter-associated nosocomial infections, as well as the need to consider antimicrobial resistance when selecting empirical treatment.

### 13. Antibiotic resistance in urinary tract infections Year 2022

**Aim:** To describe the antibiotic sensitivity of prevalent germs that cause urinary tract infections in a general hospital.

**Information Source:** PubMed

**Risk and bias of studies:** A possible bias in this study could be selection bias, as only patients whose urine cultures were positive were included.

**Methodology:** A retrospective descriptive case series study was conducted.

**Sample:** The sample consisted of the results of 1099 positive urine cultures performed on patients at the Hospital.

**Summary of results :** The results showed that *Escherichia coli* was the most commonly isolated germ in both non-hospitalized patients (76 %) and hospitalized patients (49 %).

**Limitations of the evidence:** A limitation of this study could be its retrospective design, which limits the ability to establish causal relationships.

**Implication:** The findings of this study highlight the importance of continued monitoring of antibiotic sensitivity in the treatment of urinary tract infections.

### 14. Hospital-acquired urinary tract infections in patients. Year 2023

**Aim:** To establish the antibiotic resistance profile of germs involved in urinary tract infections (UTI) in adults treated at the Hospital

**Information Source:** Scopus

**Risk and bias of studies:** A possible bias in this study could be the selection of the patient population treated in a single hospital center, which might not fully represent the epidemiology of UTI in the region.

**Methodology:** Retrospective cross-sectional study based on analysis.

**Sample:** The study sample included all 543 adult patients treated at the Hospital.

**Summary of results:** The results showed that *Escherichia coli* was the most frequently isolated germ (58,2 %), followed by *Klebsiella pneumoniae* (13,2 %) and *Pseudomonas aeruginosa* (4,3 %).

**Limitations of the evidence:** A limitation of the study could be the lack of data on previous use of antibiotics by patients, which could influence the resistance profiles observed in urine cultures.

**Implication:** The study's findings highlight the importance of continued monitoring of antibiotic resistance profiles in the treatment of UTIs. The results may guide the selection of more appropriate empirical antibiotics in the clinical management of UTIs at San José Hospital and help improve infection control strategies in the hospital setting.

Thoroughness in the analysis of the results obtained in this systematic review is essential. This gives us the opportunity to delve deeper into aspects that are closely related to the object of study.<sup>(1,2)</sup>

In this paragraph, I am talking about urinary tract infections (UTIs) in hospitalized patients and how they can have serious health consequences and increase the workload on healthcare systems. I highlight that the incidence of UTIs in hospital settings can vary due to several factors such as patient age, length of hospitalization, presence of invasive devices such as urinary catheters, and exposure to broad-spectrum antibiotics.<sup>(3,4)</sup>

Impact of UTIs on hospital healthcare: UTIs represent a significant burden on healthcare systems, increasing hospital costs and morbidity. Their high incidence and association with serious complications such as sepsis and acute renal failure underscore the importance of effectively addressing this problem.<sup>(5,10)</sup>

Risk factors and underlying causes: It is critical to understand the factors that predispose hospitalized patients to develop UTI, such as the presence of urinary catheters, immunosuppression, and exposure to broad-spectrum antibiotics. These factors contribute to bacterial colonization of the urinary tract, which increases the risk of infection.<sup>(11,12)</sup>

Importance of accurate diagnosis: Accurate diagnosis of UTIs in hospitalized patients is essential for proper management. Diagnostic methods, such as urinalysis, urine culture, and antibiotic susceptibility testing, are discussed, as is the importance of differentiating between asymptomatic bacteriuria and symptomatic urinary tract infection.<sup>(8,13)</sup>

Management and treatment: Treatment approaches for hospital-acquired UTIs are discussed, including the use of antibiotics and additional measures such as removal of urinary catheters. The importance of selecting the appropriate antimicrobial therapy based on the sensitivity of the identified pathogen and the severity of the infection is highlighted.<sup>(17,18)</sup>

Prevention of UTIs: Effective strategies to prevent UTIs in hospitalized patients are discussed, such as promoting mobility and proper hygiene, reducing unnecessary use of urinary catheters, and implementing evidence-based catheter insertion and management protocols.

Special Considerations: Special considerations are addressed in the management of UTI, such as in specific populations such as postmenopausal women, men with prostate disorders, and older adults, as well as the importance of antibiotic prophylaxis in certain cases.

## CONCLUSIONS

After a thorough review of the literature on urinary tract infections in hospitalized patients, it is concluded that these are common, with multiple risk factors. The implementation of precise protocols for the early diagnosis of urinary tract infections in hospitalized patients, with emphasis on microbiological techniques and antimicrobial sensitivity tests, is essential. The design of specific nursing care plans for hospitalized patients with urinary tract infections, focused on the prevention of complications, pain control, and the promotion of hygiene and self-care is essential to improve the quality of care and optimize clinical outcomes.

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