

Antimicrobial susceptibility of strains isolated *Enterobacteriaceae* in urine samples in patients with urinary tract infections. Period January 2013 – January 2016

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Abstract

The urinary tract infections (UTI) are one of the main reasons for consultation in the field both outpatient and Hospital. This study aims to establish the susceptible antimicrobial stability of *Enterobacteriaceae* strains isolated from urine samples in patients with urinary tract infections Hospital General "Dr. Liborio Panchana Sotomayor". Treat diseases directly with the appropriate drug benefits the community in providing faster recovery and better living conditions. A retrospective observational study. The universe are patients of all ages and both sexes, urinary tract infections They are attending the Hospital General "Dr. Liborio Panchana Sotomayor" Santa Elena, period from January 2013 to January 2016. To determine the antimicrobial susceptibility, it was used the method Kirby Bauer disk diffusion. *Escherichia coli*, it was found in a high percentage of cases, the most common etiologic agent. The infection rate was much higher in women than in men. With respect to patterns of antimicrobial susceptibility commonly used for treatment the UTI, it was found in strains of *Enterobacteriaceae*. It was sensitive to nitrofurantoin, gentamicin, Amox. + Ac.Clavulánico. Low sensitivity to antibiotics such as aminopenicillins, first generation cephalosporins and ciprofloxacin showed. In hospitalized patients a high percentage of multiresistant strains was obtained

Antimicrobial susceptibility, *Enterobacteriaceae*, urinary tract infections

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Introduction

In the province of Santa Elena no data are available to assess what the real situation in this respect, on the behavior of bacteria against different antibiotics.

These conditions are aggravated by the fact that an accurate diagnosis requires both clinically and positive urine culture, which implies an empirical antibiotic treatment. (Foxman, 2002)

Through this research project aims to show the reality in relation to this problem, because in the town there is a network of surveillance to track the effectiveness of antibacterial therapy and make visible microbial resistance levels. (Johnson, 2002)

The purpose of this research is to recover and identify strains of *Enterobacteriaceae* urine cultures between the months of January to December 2014 in patients with urinary tract infections (UTI) are found in General Hospital "Dr. Liborio Panchana Sotomayor "Santa Elena, since the study area is a site occur frequently urinary infections of different natures and therefore it is important to do this work.

Considering the need to provide support for specialized committee of prevention and infection control for the sound management of antibiotics and increase the therapeutic efficacy of established protocols, information obtained during the conduct of this study is of great importance in the health area, because it will reveal the susceptibility of strains of *Enterobacteriaceae* to antibiotics of first choice and alternative drugs. Thus significant improvements occur in the therapeutic treatment and the economics of antibiotics.

Treat diseases directly with the appropriate drug benefits the community in providing faster recovery and better living conditions. (Hellestein ,2006)

Type of study is retrospective, observational.

Universe: It will consist of urine samples of patients of all ages and both sexes who come to the Hospital General "Dr. Liborio Panchana Sotomayor "Santa Elena, with urinary tract infections in the period from January to December 2014.

Sample size: It is equal to considering inclusion and exclusion criteria universe.

Criteria and exclusion inclusión: Samples to consider are those that meet the following criteria:

1. Samples of patients of both sexes and all ages and what are being treated at the Hospital General" Dr. Liborio Panchana Sotomayor "in the period between January to december 2014.
2. Samples of patients who meet the acceptance criteria of the laboratory.
3. Urine samples in which *Enterobacteriaceae* recovers.

Well as samples with exclusion criteria are:

1. Those who do not meet the inclusion criteria.

Materials and methods

Of the approximately 13,050 urine cultures are performed annually in the Hospital "Dr. Liborio Panchana Sotomayor "between the period January 2013 to December 2015, 1,800 were positivos.

EXPERIMENTAL DESIGN

June 2015 Vol.2 No. 2 93-97

Of these, it was excluded 650 corresponding to hospitalized patients.

The highest percentage of UTI is caused by *Escherichia coli*, with 38% of cases, 27% are caused by *Klebsiella spp*, then lower percentages are: *Proteus mirabilis* with 14%. (Ronld, 2002)

They have also been found, other etiologic agents but less frequently, among them are: *Staphylococcus* negative coagulase, *Enterobacter spp*. *Streptococcus agalactiae* among others. (Ria, 2009)

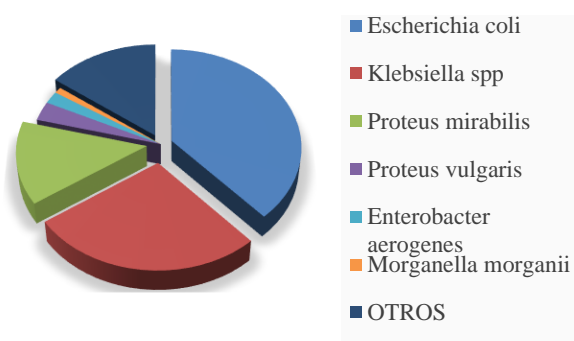


Figure 1 Distribution causative agen of urinary tract infections

The study found that between the ages of 26-64 years are more susceptible to UTI, 38.6% of cases. Ages between 13 to 25 years with 28.4% ranked second, the third was for ages 50 to 64 with 5.7%, those aged under 5 years, 65 years and over had low percentages. Also we can see that correspond to a lower percentage, they are male, while a higher percentage of patients are female. (Frimod, 2002)

The age groups of 13 to 25 years and 26 to 64 were selected by a high rate of urinary tract infections. In this age group we will evaluate the antimicrobial susceptibility against drugs of first choice. (Ochoa, 2005)

A tab data collection will be designed, built a database in Microsoft Excel 2007. Results are expressed as percentages and shown in tables. To determine the antibiotic sensitivity diffusion method Disk, which provides two groups of antibiotics= Group 1 ant ibióticos first choice will be used.

Escherichia coli, found in 38% of cases, the most common etiologic agent. Other germs most frequently associated with this pathology are caused by *Klebsiella spp*. 27%, then lower percentages are: *Proteus mirabilis*, *Staphylococcus cogulasa* negative, *Enterobacter aerogenes*, *Streptococcus agalactiae* among others.

On the other hand aged 26-64 years are more susceptible to UTI in 38.6% of cases, followed by the range of 13-25 years (28.4%). The infection rate was much higher in women than in men.

Results

With respect to patterns of antimicrobial susceptibility commonly used to treat the UTI found that *Escherichia coli* was sensitive to nitrofurantoin (91,1%), gentamicin (77,9%), Amox. + Ac. Clavulanate (62,8%) and ciprofloxacin (54%), and showed low sensitivity to ampicillin (20%), trimethoprim sulfamethoxazole (44,9%) and cephalothin (52,2%). This is consistent with those reported in the literature. (Tablet #2)

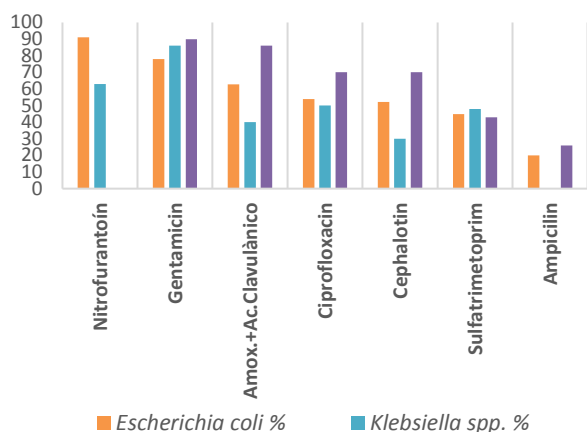


Figure 2 Distribution and frequency of antimicrobit susceptibility of Enterbacteriaceae strains against drugs of first choice

When referring susceptibility profile of *Escherichia coli* isolated, as it was observed that there was low frequency of resistance to most antibiotics tested; however, the maximum levels of resistance were found in the antibiotics administered orally and often indicated for uncomplicated urinary tract infections.

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Conflict of interest: No conflict of interest to declare.

Conclusion and recommendations

This result reflects the widespread use of fluoroquinolones and beta-lactam antibiotics as empirical therapy of UTI. The intensive use of these and other antimicrobials, exerts selective pressure on microorganisms, which could explain the patterns of antimicrobial resistance found in this investigation.

Gentamicin could be ideal for empirical treatment of uncomplicated community UTI. Likewise, the information sensitivity profiles will be distributed to all health personnel especially prescribers for good rational use of antibiotics. Besides antibiotics with high percentage of sensitivity will be presented to drug area committee to be analyzed and thus considerable improvements will occur in the therapeutic treatment and the economics of antibiotics. Treat diseases directly with the appropriate drug benefits the community by providing more speed your recovery and better living condition.

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EXPERIMENTAL DESIGN

June 2015 Vol.2 No. 2 93-97

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