Bacterial isolates associated with urinary tract infections in children

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Abstract

Urinary tract infections UTI are common conditions worldwide and the pattern of antimicrobial resistance varies in different regions. We describe the relationships between sex,age and isolated bacterial agents and antibiotic resistance of UTIs solates . The study was confined to UTIs in children .The present study were aimed to investigate the antibiotic resistance of urinary pathogens isolated from Al - Sadder Hospital .The total number of samples was (50) sample, from 22 children samples were positive for culture.The most bacterial isolates in the present study was Enterobacter spp 6(27.2%) , Ecoli 4(18.1%) , Pseudomonas spp 3(13.6%) , Escherichia spp, Staphylococcus aureus ,Salmonella spp, Klebseilla spp, Citrobacter spp were 2(9.09) % and Edwardsilla spp 1(4.5%) Antibiotics resistance in the most common gram negative than in gram positive. The high effective antibiotics were Imipenem in all isolates.

العزلات البكتيرية المرافقة لخمج المجاري البولية للاطفال

الخلاصة

التهاب المجاري البولية من الامراض الواسع الانتشار في العالم و ذات مدى عالي للمقاومة المضادات الحيوية . نلاحظ في بحثنا هذا هناك علاقة بين الجنس والعمر والبكتريا المعزولة من المجاري البولية عند الاطفال ومقاومه تلك البكتريا للمضادات الحيوية .ان الهدف الرئيسي من هذه الدراسة يهدف الى معرفه مقاومه البكتريا للمضادات الحيوية.تم اخذ عينات الإدرار من مستشفى الصدر العام وكانت عدد العينات ٥٠ عينه من بينها ٢٢ عينة ذات نتيجة ايجابية والبقية هي سالبة النتيجة اي عدم ظهور البكتريا عند الزرع .ان معظم البكتريا المعزولة في هذه الدراسة كانتEnterobacter pp٦(٢٧,٢%) و Ecoli ٤(١٨,١%) وكانتKlebseilla spp, و,Salmonella spp وpseudomonas spp, و Escherichia spp, و جميعها ٣%(٦, ١٣) اما بالنسبة لبكتريا citrobacter ssp فكانت نسبتها ٢(٩,٠٩%) في حين كانت النسبة١ (٥,٤%) لبكتريا Edwardsilla spp اما بالنسبة للمقاومه المضادات الحيوية فقد كانت معظم البكتريا المعزوله هي البكتريا السالبة لصبغه كرام و من العائلة المعوية وكان ال Imipenem من أكثر المضادات تاثيراعلى معظم العزلات المرضيه .

Urinary tract infection: Is the colonization of a pathogen occurring in any part in urinary tract: Kidney , ureter, bladder and urethra [1]. Urine tract infection is the most common serious bacterial infection causing illness in infants and children [2].It is acquired by an estimated 3-5% of females and 1% of males [3].

Anatomic and physiologic factor put children at risk of developing UTI . Any anatomic or functional abnormalities of the urinary tract that impede urinary flow can increase the most susceptibility to UTI [4].Although UTI may be caused by any pathogen that colonizes the urinary tract (e.g. fungi , parasite and viruses),the most causative agents are bacteria of enteric origin .The causative agent varies based on age and associated comorbidities [5].Enterobacteriaceae are the most causing urinary tract infections in humans[6]. An infection with Ecoli is the most frequent documented uropathogen. Among neonates, UTI caused by group B-streptococci is more common in neonate than in older populations [7]. In immune compromised children and children with indwelling catheters, *Candida Spp* may be isolated from urine[8].Noscomial infections are typically more difficult to treated and caused by various organisms, including E coli , Candida, Enterobacter ,and Pseudomonas[9].Ability to adhere to host epithelial cells within the urinary tract is the most important determinant of uropathogenic strains pathogencity [5]. Antibiotics used for treatment of UTI includes amoxicillin, cephalosporins, tetracycline, nitrouration but fluoroquinolones are most a commonly used[10].Development of resistant strains is a common problem in antimicrobial chemotherapy .Among uropathologenes the rate of resistance is high and frequency of resistance to antibiotics and drugs is directly linked to consumption of antibiotics [11].In children with suspected UTI, antibiotic treatment is usually started before urine culture results are conducted to ensure appropriate treatment, knowledge of the organisms that cause UTI and their antibiotic susceptibility is mandatory.

Materials and Methods:

Isolalation and identification of UTI isolates:

Fifty urine samples from UTI patients were collected from September 2010 to May 2011 were collected from different pathological laboratory of Al sadder Hospital for the isolation of UTI causing strains ,loopfull of urine sample was streaked on Nutrient agar plate and incubated at 37c for 24hr . Next day individual colonies were selected and identified on the bases of morphological cultural biochemical characteristics.

Identification of gram negative bacteria :

To check morphological characteristics gram –staining, motility test were performed. To check the growth use different media including MacConkey agar. Eosin methylene blue agar were used for biochemical tests ,sugar fermentation, IMVIC and nitrate tests.

Identification of gram positive bacteria:

To check morphological characteristics ,gram staining was used to the growth pattern different media , including MacConkey agar ,nutrient agar **,** brain heart infusion agar mannitol salt agar and blood agar base supplemented with 5%sheep blood were used .For biochemical characteristics sugar fermentation ,Oxidase , coagulase, catalase were used .

Maintenance of clinical isolates :

Stock cultures were maintained by growing the UTI isolates in 3 ml nutrient broth and next day overlaying with 3ml 40%glycerol .Procedure on blood agar, nutrient agar samples with more than 10^4CFU/ml and 4-5 leucocytes /field were regret as UTI.

Sensitivity test:

The method of (Bauer et al;1966) was used for the purpose of sensitivity of bacteria for the antibiotics by disc diffusion technique by serial-cotton swabs (from Himedia company)on Mueller-Hinton agar (from Biolife company) .The sensitivity test for bacterial isolates to 9 antimicrobials, these antibiotics was Ampicillin , Cephalexin, Ciprofloxacin , Imipenem ,Tetracycline, Trimethoprim ,Cefotasime and Amoxicillin.The inhibition zone diameter was measured and recorded according to (NCCLs., 2002).These results comprised with standard strain of (E coli ATCC 25922).

Results:

A total of 50 children were studied from from September 2010 to May 2011, we reported that (22) isolates were gram negative and gram positive .The prevalence of UTI in children was in the males 16 (72.7%) and 6 (27.2%) in the females show in able (1). The cases of UTI were distributed as(50%) in age (1 - 5) years followed by 6(42.8%) in (5-10) and 1(71.4%) in age (10-15) as show in table(2).The most frequent gram negative isolates were Enterobacter spp 6(27.2%),E coli 4(18.1%), pseudomonas spp 3(13.6%) , Escherichia spp, Staphylococcus aureus ,Salmonella spp, Klebseilla spp, Citrobacter spp were 2(9.09%) and Edwardsilla spp 1(4.5%) .Antibiotics resistance were most common in gram negative than in gram positive. The less effective antibiotic was Imipenem as show table 4 and table 5).

Table (1)
: Sex distribution of UTI patients

Table(2)

Distribution of UTI patient s according to age groups

Table (3)
No. &percentage of bacterial isolates from UTI

Table(4)
Resistance of bacterial isolates to antimicrobial agents

Antibiotics*: AM:Amipicillin ,TE:Tetracycline, Cxt:Cefotaksime, Tmp:Trimethoprim Cip: Ciprofloxacin , ,Amc: Amoxicillin

Discussion:

Urinary tract infections (UTIs) occur commonly during childhood, affecting an estimated 2.6% to 3.4 % of children every year. Throughout childhood the risk of UTI is 2% for males and 8% for females[14]. Table (1) showed disruption of sex in patients with UTI for (50) children were obtained from 16(72.7%) males and 6(27.2%) females the ratio is higher in the male than the females . These results agreement with[15] the age of children (1-5) year the annual incidence of UTI is 0.9% to 1.4 % for females and 0.1%