

URINARY TRACT INFECTION AMONG TEENAGERS IN UMUDIOKA IN ORLU L. G. A. OF IMO STATE, NIGERIA

*Ogomaka, I.A.¹; Dike-Ndudim, J.N.¹; Ogbulie, T.E.²; Dike, D. O.³; Nwokeji, M.C.³; Egbuobi, R. C.¹

¹Dept of Microbiology, and Medical Laboratory Science, Imo state University. Owerri, Nigeria.

²Dept. of Biotechnology, Federal University of Technology Owerri, Nigeria.

³Dept. of Pathology and Histopathology, Federal Medical center, Owerri, Imo State, Nigeria.

*Corresponding Author's email address: pmcog@hotmail.com

Abstract- A Most urinary tract infections (UTIs) are caused by bacteria that inhabit the intestinal tract as normal flora. *Escherichia coli* being one of the predominant inhabitants of the bowel have often been queried to cause of vast majority of the UTIs especially among women. Mid -stream clean catch technique was adopted in the collection of 500 urine specimens which were analyzed using standard method of urine culture technique. The result obtained showed that of 500 urine specimens examined, 195 (39%) were infected mostly with *E. coli*. Of these number, 162(83.1%) had a total of *E. coli* bacteriuria count ranging from 1.28×10^5 to 1.67×10^5 cfu/ml. Other bacteria isolates encountered include, *Proteus sp* (1.3%), *Klebsiella* (4.2%), *Staphylococcus aureus* (5.4%) and coagulase negative *Staphylococcus* (2.4%). The strain of the *E. coli* isolated was however susceptible to most of the antibiotics tested against it. From the above study and observations, there is need for urgent awareness campaign and mass education to the teens and other adults on the danger of the disease and ways of preventing and controlling it, especially in the area of personal hygiene, proper ways of cleaning after defecation and self-control.

Keywords- A urinary tract, infections, teenage, *E. coli*, Umudioka, Antibiotics

I. INTRODUCTION

Urinary tract infection is an ancient infection that was first described and documented in the Bears Papyrus dated to circa 1550 B.C. (Al-Achi,2008).It was described by the Egyptians as sending forth heat from the bladder (Wilson ,1990) Then there was no effective treatment until the development and availability of antibiotic in the 1930s before which time herbs and bloodletting were the only treatment in use,(Al-Achi,2008).Infection of the urinary tract system however, occurs when too much bacteria especially those that inhabit the gastrointestinal tract and the skin enter the vagina through the anus and thrive inside the urinary system (kidney ,ureter, bladder and urethras) and consequently reproduce rapidly due to available nutrients(Brett-White,2011; Stever,2002; Takhar, 2011).Infection of the urinary tract could manifest differently depending on the site of the infection and length of time involved, those that affect the lower urinary tract are called the cystitis- involving the bladder alone with symptoms including painful urination, burning sensation, either frequent or urge to urinate (or both) while those that affect upper urinary tract are the pyelonephritis involving the kidney and other organs. The symptoms of the upper urinary tract include; fever and flank pain during urination in addition to those of the lower urinary tract (Sarah, 2010).

It is second most common type of infection accounting for about 8.1million visits to health care providers each year being the commonest cause of morbidity (especially renal disorder) and mortality in children specifically among those of lowest socio economic status,(Bervocal et al., 2002; Chukwu et al., 2011 and Eket et al.,1994).

Girls and women are more prone to UTIs than their male counterpart younger than 50 years of age, the reason although not well established but anatomical positions and differences might be responsible. The high risk of UTI in women is mostly due to shortness of the urethra which is about 1.5inches compared to 8inches in men. Hence bacteria from fecal matter at the anal opening can be easily transferred to the opening of the urethra. It is estimated that about 20- 30% of adult women experience UTIs at least once during their life time,(Nakhajani,etal.,2007; Kunin,1994).Many girls who wear diapers training pants, tight pants and those who wet themselves or retain their urine long after having the urge to urinate stand greater risk of suffering UTIS. Consequently keeping fomites soaked with urine against the body tissue allows uropathogenic organisms to enter the system and cause infections,(Sarah,2010)

Although, many uropathogenic organisms are associated with UTIS, *Escherichia coli* is the most predominant bacteria and most often the sole cause most infections .Other bacteria that are occasionally encountered include: *Klebsiella species*, *Pseudomonas aeruginosa*, *Enterobacter species* *Proteus sp.*, *Staphylococcus species* etc. (Bonadio et al., 2001; Uwaezoke and Ogbulie,2006).

Several diagnostic methods that identify the presence of nitrite, white blood cell and urine culture for establishment of specific causative organisms are available paving ways for accurate and timely diagnosis of the infection which is paramount in the shortening of the diseases and preventing the ascent of the infection from the lower tract to the upper tracts (International Supplement, 2005).

Most UTIs are caused by bacteria which are treated with bacteria fighting medications called antibiotic or antimicrobials. The choice of medication and length of treatment depend on the patient's history and the type of bacteria causing the infection.

Indiscriminate and extensive use of antibiotics, however, results in the development of resistant strains which in recent years have become major health problem to medical practitioners and to the public at large(Sirro et al.,1992).Hence it becomes necessary that to effectively treat and control

infections such as UTIs by health care provider, a good knowledge of the antibiotic sensitivity pattern of the causative organisms should be ascertained before drug administration, (Nsofor, *et al.*, 2011; Woodford and George, 2011; Uwaezuoke and Ogbulie, 2006). This study, therefore aims at investigating the prevalence of *E. coli* associated urinary tract infection among teenage girls and its antibiotic sensitivity pattern in the study area.

II. MATERIALS AND METHODS

This study was carried out between March and September, 2010, using teenage girls in Umudioka in Orlu Local Government Area of Imo state. The area is purely a rural one with no regular social amenities coupled with the worst of the roads and lack of the least health facilities. Indigenes are mostly farmers and business men and women majority of whom leave outside the town. Five hundred urine samples were collected from the participants (teenage girls) using mid-stream clean catch method of Kunin, (1987) after obtaining consents from the appropriate authorities and individuals. The samples collected in sterile universal bottles were cultured on appropriate media (plate count agar, CLED and blood agar media) about half an hour after collection using calibrated wire loop. Cultures were incubated aerobically at 37°C for 24 hour after which the plates were read and interpreted accordingly CLSI.

Bacteria identification was based on the standard microbiological culture and biochemical characteristics of

isolates (Uwaezuoke and Ogbulie, 2006). Antimicrobial susceptibility testing of *E. coli* was carried out using disc diffusion method according to clinical and laboratory standard institutes' recommendations on Muller Hiltons agar. The drugs tested include; ampicillin, septrin, chloramphenicol, sparfloxacin, ciprofloxacin, amoxicillin augmentin gentamycin, pefloxacin and streptomycin.

III. RESULTS

The result of the *E. coli* associated urinary tract infection among teenage girls showed that out of 500 (39%) were infected, Of these number, 162 (83.1%) showed significant bacteriuria with 1.28×10^5 /ml to 1.67×10^5 cfu/ml of *E. coli*. Other uropathogenic organisms encountered include; *Proteus spp* 17.67%, *Klebsiella spp*, 14.3%, *Staphylococcus aureus*, 11.12% and 16.7% for coagulase negative *Staphylococcus*.

Antibiotic susceptibility pattern of *E. coli* also revealed vast susceptibility level to antibiotics tested revealed ciprofloxacin, 80% of having the highest susceptibility to the organism while the susceptible or highest resistant drug was amoxicillin, 58%. Table 3 Age related prevalence showed that infection was more among the older (53.2%) than the younger teens (25.7%). Infection was more among the older girls, 18 and above, 44.45% than among the younger teenagers.

Table 1: Prevalence of uropathogenic organisms isolated from the urine samples.

Organisms isolated	Total number examined	Number infected	Significant bacteriuria
<i>Escherichia coli</i>	500	195 (39%)	162 (83.08%)
<i>Proteus spp</i>	500	6 (1.25)	1 (16.67%)
<i>Klebsillae</i>	500	21 (4.2%)	3 (14.29%)
<i>Staphylococcus aureus</i>	500	27 (5.40%)	3 (11.12)
Coagulase negative <i>Staphylococcus</i>	500	12 (2.49)	2 (16.67%)

Table 2: Age related Prevalence of urinary tract infections

Age Range	Number examined	Number infected
12—14	152	39 (25.66%)
15—17	177	70 (39.55%)
18 and above	171	91 (53.22%)

Table 3: Antibiotic pattern of the organisms isolated

Antibiotics	Susceptibility	Resistance
Ciprofloxacin	80%	20%
Streptomycin	78%	22%
Augment	78%	22%
Gentamycin	76%	24%

Sparfloxacin	72%	28%
Tarivid	74%	26%
Amoxicillin	42%	58%
Parfloxacin	47%	53
Septin	50%	50%

Table 4: Morphological and biochemical characteristics of the isolates.

Morphological characteristics	Gram reaction	MOTILITY	CATALAS E	OXIDASE	COAGULA ON-REACT	INDOLE	Methyl	Voges-Proskauer	Citrate	H ₂ S EST	Urea Hydrolysi	Oxidation	Fermentat	Nitrate	Glucose	Sucrose	Lactose	MAITOSE	MANITOL	Arabinose	Inositol	Xylose	Organism
Small rose pink 1mm smooth	G-ve rod	+	+	-	Nd	+	+	-	-	-	-	-	F		A	A	A	A	A	A	-	-	<i>E coli</i>
Large mucoid raised pink 2mm	G-ve rod	-	+	-	Nd	-	-	+	+	-	+	-	F		A	A	A	A	A	A	A	A	<i>Klebsiella sp</i>
Cream and Swarming	G-ve rod	+	+	-	Nd	-	-	-	-	+	+	-	F		A	A	-	A	A	-	A	A	<i>Proteus sp</i>
Cream smooth 1mm	Gve cocci	-	+	-	+	-	+	+	-	-	+	-	F		A	A	A	A	A	-	-	A	<i>Staph aureus</i>
Cream smooth 1mm	Gve cocci	-	+	-	-	-	+	+	-	-	+	-	F		A	A	A	A	A	-	-	A	<i>Coagulas neg. Staph</i>

Key; -ve/- = Negative, F = Fermentative
+ve/+ = positive, O = Oxidative
ND = Not done A=Acid, A/G = Acid and Gas

IV. DISCUSSION AND CONCLUSION

The result of the urinary tract infection among teenage girls in the study area revealed *Escherichia coli* as the most predominant organism having significant bacteriuria as 83.1%. This result agrees with the works of Methvish and Daniel,(2010); Chukwu *et al.*, (2010); McNulty *et al.*,(2004) and Ziad and Claude,(2001).This observations of E coli being the most prevalent uropathogenic organism could be attributed to many factors including anatomical position of the vagina which is very close to the anus making it very easy for gastrointestinal organisms to get in contact with the urinary tract system possibly due to unhygienic cleaning from back to front(Kahlmeter,2003; Kumar *et al.*,2006). It could also be that *E coli* being one of the normal floras to the vagina that possesses attachment organ Pilli, with which it attaches to the urinary tract wall and somehow refuses flushing even with heavy water intake once it has been pushed up the urethra –a tube connecting bladder to the vagina. It may also be related to some ill health which reduces the immune system and encourages the over growth of bacteria in the urinary tract. In some other instances the issue of dysfunctional voiding resulting from retention of urine too long after the bladder signals its fullness may be contributory to the infection,(Sarah,2010).

High prevalence of uropathogenic bacteria among the older girls suggest and imply that this group of individuals may in addition to other social involvements may have started enjoying premature sex through which these organisms are pushed up the urinary tract where they multiply very easily and cause infections. Furthermore, most teens, in the bid to protect themselves from sexual harassments form the habit of

wearing very tight pant close to the body so many of which are not of cotton made. This habit brings these organisms very close to the body tissue thereby causing infection (Sarah, 2011)

High antibiotic sensitivity exhibited by *E coli* to vast majority of the antibiotics simply shows that even though *E coli* is often the sole cause of UTI infection, the treatment could easily be achieved especially with new regimen of drugs which may not have been abused. It could also imply that the specie of *E coli* involved has not developed resistant strain to the drug showing high sensitivity while those with low sensitivity or high resistant, Amoxicillin, Ampicillin Chloramphenicol etc. could be due to development of resistant strain or through drug abuse, (ZO *et al.*, 1999).This however, may result due to the fact that people are used to self-mediations which invariably lead to inefficient treatments. Generally, the result obtained from this study is not uncommon because, UTIs has been known to be most common among women with about 10% developing the illness yearly (Salvator *et al.*, 2011). It is also true especially in the village setting where healthy life practices are somehow given the least priority due to poverty. It therefore, becomes very necessary that both the government and health care givers should be encouraged to move into the rural communities including urban and educate the dwellers especially women on the danger and effects of UTIs. They should also acquaint them on the measures of preventing and controlling the infection. Routine diagnosis should be highly emphasized and appropriate treatment administered as early as possible to prevent spread.

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