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Incidence of Urinary Tract Infection among Male Diabetic Patients in Ikot Ekpene Senatorial District

[1]*Adenugba, I,T. , [1]*Uko, E.A. , [2]*Ntekpere, E. I., [3]*John Nsini

Department of science technology, school of applied science, akwa ibom state polytechnic, ikot osurua

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ABSTRACT

The results of the analysis of incidence of urinary tract infection among male diabetic patients in Ikot Ekpene senatorial district revealed the presence of bacterial isolates to include Enterococcus sp, Escherichia coli, Staphylococcus sp, Streptococcus sp, Proteus sp and Klebsiella sp. Enterococcus sp recorded the highest frequency of occurrence and percentage occurrence of 28(27.7%), followed by Escherichia coli which had 27(26.7%), Staphylococcus sp had 16(15.5%), Proteus sp had 15(14.9%), Klebsiella sp had 12(11.9%) while Streptococcus sp had the least percentage occurrence of 3(2.9%). The results of urinalysis indicated the presence of protein, blood, ascorbic acid, ketone, bilirubin, urobilinogen in some samples. The result of the antibiotic sensitivity pattern reveals that Proteus sp, Klebsiella sp and Escherichia coli were all sensitive to all the tested antibiotics, except Ceporex (CEP), Ampicillin (PN), Tarivid (OFX) and Nalidixic acid (NA). Enterococcus sp was sensitive to all the tested antibiotics, Staphylococcus sp and Streptococcus sp were sensitive to all antibiotics except Amoxil (AMX) and Norfloxacin (NB). Significantly, these organisms are considered pathogenic to human and are considered a co-infector in diabetic patients, as opportunistic pathogens. Therefore, it could be concluded that urine of men diabetic patients in Ikot Ekpene Senatorial District contain some pathogenic bacteria which are associated with urinary tract infections. Prescribed medication can always help to lower the tested parameters of diabetic patients such as blood sugar, protein and ascorbic acid thereby helping them to maintain good health.

I. INTRODUCTION

Type 2 diabetes mellitus is a heterogeneous group of disorders characterized by variable degrees of insulin resistance, impaired insulin secretion, and increased glucose production. Patients with type 2 diabetes mellitus are at increased risk of infections, with the urinary tract being the most frequent infection site. Various impairments in the immune system, in addition to poor metabolic control of diabetes and incomplete bladder emptying due to autonomic neuropathy may all contribute in the pathogenesis of urinary tract infections (UTI) in diabetic patients. Factors that were found to enhance the risk for UTI in diabetics include age, metabolic control, and long term complications, primarily diabetic nephropathy and cystopathy (Brown et al., 2005).

The spectrum of UTI in these patients ranges from asymptomatic bacteriuria (ASB) to lower UTI (cystitis), pyelonephritis, and severe urosepsis. Serious complications of UTI, such as emphysematous cystitis and pyelonephritis, renal abscesses and renal papillary necrosis, are all encountered more frequently in type 2 diabetes than in the general population. Type 2 diabetes is not only a risk factor for community- acquired UTI but also for health care-associated UTI, catheter-associated UTI, and post-renal transplant-recurrent UTI. In addition, these patients are more prone to have resistant pathogens as the cause of their UTI, including extended-spectrum- beta lactamase-positive Enterobacteriaceae, fluoroquino lone-resistant uropathogens, carbapenem-resistant Entero bacteriaceae and vancomycin-resistant

Enterococci. Type 2 diabetes is also a risk factor for fungal UTI, mostly caused by Candida.

Complication in diabetes is also associated with worse outcomes of UTI, including longer hospitalizations and increased mortality (Papadimitriou et al., 2014). The increased risk of UTI among diabetic patients, coupled with the increase in the incidence of type 2 diabetes mellitus worldwide in recent years, may impose a substantial burden on medical costs. In addition, the high rates of antibiotic prescription, including broad-spectrum antibiotics, for UTI in these patients may further induce the development of antibiotic-resistant urinary pathogens (Venmans et al., 2009).

Type 1 diabetes mellitus is characterized by loss of the insulin-producing beta cells of the islets of Langerhans in the pancreas, leading to insulin deficiency. This type can be further classified as immune-mediated or idiopathic. The majority of type 1 diabetes is of the immune-mediated nature, in which T-cell-mediated autoimmune attack leads to the loss of beta cells and thus insulin (Sattar et al., 2010). Type 1 diabetes is partly inherited, with multiple genes, including certain HLA genotypes, known to influence the risk of diabetes. In genetically susceptible people, the onset of diabetes can be triggered by one or more environmental factors, such as a viral infection or diet. There is some evidence that suggests an association between type 1 diabetes and Coxsackie B4 virus. Unlike type 2 diabetes, the onset of type 1 diabetes is unrelated to lifestyle.

Type 2 diabetes mellitus is characterized by insulin resistance, which may be combined with relatively reduced insulin secretion. The defective responsiveness of body tissues to insulin is believed to involve the insulin receptor. However, the specific defects are not known. Diabetes mellitus cases due to a known defect are classified separately. Type 2 diabetes is the most common type. In the early stage of type 2, the predominant abnormality is reduced insulin sensitivity. At this stage, hyperglycemia can be reversed by a variety of measures and medications that improve insulin sensitivity or reduce glucose production by the liver. Dietary factors also influence the risk of developing type 2 diabetes. Consumption of sugar sweetened drinks in excess is associated with an increased risk. The type of fats in the diet is also important, with saturated fats and trans fatty acids increasing the risk and polyunsaturated and monounsaturated fat decreasing the risk. Eating lots of white rice appears to also play a role in increasing risk. A lack of exercise is believed to cause 7% of cases (Vijan, 2010).

Gestational diabetes mellitus (GDM) resembles type 2 diabetes in several respects, involving a combination of relatively inadequate insulin secretion and responsiveness. It occurs in about 2-10% of all pregnancies and may improve or disappear after delivery. However, after pregnancy approximately 5-10% of women with gestational diabetes are found to have diabetes mellitus, most commonly type 2. Gestational diabetes is fully treatable, but requires careful medical supervision throughout the pregnancy. Management may include dietary changes, blood glucose monitoring, and in some cases insulin may be required (Santaguida et al., 2008).

Insulin is the principal hormone that regulates the uptake of glucose from the blood into most cells of the body, especially liver, muscle, and adipose tissue. Therefore, deficiency of insulin or the insensitivity of its receptors plays a central role in all forms of diabetes mellitus. The body obtains glucose from three main places: the intestinal absorption of food, the breakdown of glycogen, the storage form of glucose found in the liver, and gluconeogenesis, the generation of glucose from non-carbohydrate substrates in the body (Nathan et al., 2015).

Insulin plays a critical role in balancing glucose levels in the body. Insulin can inhibit the breakdown of glycogen or the process of gluconeogenesis, it can stimulate the transport of glucose into fat and muscle cells, and it can stimulate the storage of glucose in the form of glycogen. Insulin is released into the blood by beta cells (13-cells), found in the islets of Langerhans in the pancreas, in response to rising levels of blood glucose, typically after eating. Insulin is used by about two-thirds of the body's cells to absorb glucose from the blood for use as fuel, for conversion to other needed molecules, or for storage. Lower glucose levels result in decreased insulin release from the beta cells and in the breakdown of glycogen to glucose. This process is mainly controlled by the hormone glucagon, which acts in the opposite manner to insulin (Bartoli et al., 2011).

Therefore, the study was aimed at examining the incidence of urinary tract infection(UTI) among male diabetic patients in Ikot Ekpene Senatorial District.

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II. MATERIALS AND METHODS

SAMPLE COLLECTION

With ethical and informed consent, samples were collected from three (3) different health centres within Ikot Ekpene Senatorial District which included;

- Cottage Hospital Ukana, Essien Udim Local Government Area
- Community Health Centre Ikpe Ikot Nkon in Ini Local Government Area
- General Hospital Abak, Abak Local Government Area.

A total of 77 male diabetic patients voluntarily submitted their midstream urine samples in a wide mouthed sample bottles with labels of names and numbers for easy identification. These were aseptically transported to the microbiology laboratory in batches for analysis.

STERILIZATION OF MATERIALS

Glass wares were sterilized at 160°C for one hour using hot air oven, culture media were sterilized by moist heat using autoclave according to manufacturer's instruction, inoculation loop were sterilized by flaming using dry heat and the working bench was disinfected with ethanol and cottonwool.

PREPARATION OF CULTURE MEDIA

All culture media used in this work were prepared according to manufacturer's instruction. They were appropriately labeled before dispensing into sterile Petri dishes.

MACRO AND MICROSCOPIC ANALYSIS OF THE URINE SAMPLES

Macroscopic Analysis of the Urine Sample

Each of the urine was examined macroscopically for the colour and the appearance of the urine. The odour was also perceived using human sense of smell, the fasting blood sugar (FBS) was carried out using fasting blood sugar machine model IGM-OO 17B and each of the result were recorded immediately against each sample. Normal human sugar level for non-diabetic individual is 70-100mg/dl (3.9-5.5 mmol/L) while diabetics patients recorded normal blood sugar level as 10mmol/L (180mg/dl). High blood sugar (hyperglycemia) level 140mg/dl (7.8mmol/L), while low blood sugar (hypoglycemia) is 60mg/Dl (3.3mmol/L).

Using combi 9 (urinalysis test strip) urinalysis of each of the urine sample were conducted to assess the level of blood, urobilirubin, bilirubin, protein, nitrite, keton, ascorbic acids, glucose and pH content of the sample.

Microscopic of the Urine Sample

Microscopically, the urine sample was viewed using wet preparation method. A clean grease free glass slide were used for a wet mount of the sample by releasing a drop of the sample on the slide using a sterile dropper and then covered with a cover slid and mounted for examination using dark field with x40 objective for the examination of white blood cells, cast, yeast cells, epithelial cells, plus cell and parasite. The result of each sample was recorded immediately against each sample.

MICROBIOLOGICAL ANALYSIS OF SAMPLES

Cultivation of Microorganism

Using the pour plating method, 1ml of the sample was aseptically transferred into a sterile Petri dish then followed by about 18m1 of the agars used (CLED and McConkey, Oxoid Ltd, Bashingstore Hampire, Uk), this was swirled properly to allow for mixture and spread of bacterial growth, they were allowed to set on the table then later invertedly incubated at 37 °C for 24 hours (Cheesbrough, 2005).

Enumeration of Bacteria Isolates

Bacterial isolates were characterized and identified based on their morphological and cultural characteristics. The emerging visible discrete colonies in the inoculated plates were counted and expressed in colony forming unit (cfu/ml). Samples with significant /prominent bacterial growth according to Cheesbough count ($>10^6$ organism/ml) were considered as cultured positive for UTI and were chosen for the bacteriology analysis. They were later subcultured on nutrient agar plates then transferred to MacCartney bottle as stock and stored in the refrigerator at 4 °C (Cheesbrough, 2005).

Purification of Bacterial Isolates

Sub culturing of all the grown colonies was done by streak method on freshly prepared agar plates. These were incubated for 24 hours at 37 °C and pure colonies were transferred to sterile MacCartney bottle with prepared fresh agar slant. It was incubated at 37 °C for 24 hour and then stored in the refrigerator at 4 °C for further biochemical analysis as described by Cheesbrough, (2005).

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Characterization and Identification of Bacterial Isolates

Characterization and identification of bacterial isolates was based on standard laboratory method the spore Gram's reaction and biochemical test carried out as confirmatory test were catalase, coagulase, citrate, urease, motility, methyl red, vogesproskaver test and sugar fermentation for the identification of isolates as described by Holt et al., (1994).

ANTIBIOGRAM OF BACTERIA ISOLATES

This test was carried out to determine the resistance profile of bacterial isolates. Molten Meuller Hinton agar was poured into Petri dishes according to Cheesbrough, (2005). The plates were inoculated with the bacterial isolates using Kirby-Bauer dilution method. Commercially available antibiotics (both Gram positive and negative) disc containing the following Gram negative discs, Tarvid (10mcg), Reflacine (10mcg), Ciproflox (10mcg), Augmentin (30mcg), Gentamycin (10mcg), Streptomycin (30mcg), Ceporex (10mcg), Nalidixic acid (30mcg), Septrin 30(mcg) and Ampicilin (30mcg) were placed on the surface of the media while Gram positive discs contain antibiotics such as Ciproflox (10mcg), Norfloxacin (10mcg), Gentamycin (10mcg), Amoxil (20mcg), Streptomycin (30mcg), Rifampicin (20mcg), Erthromycin (30mcg), Ampiclox (20mcg), Levofloxacin (20mcg) and Chloramphenicol (30mcg) were placed on the surface of the media. Observation was made after 24 hours of incubation at 37 ℃ in the incubator for zones of clearing. Zones of inhibition were interpreted as resistance or sensitive using the interpretative chart of the zone sizes of the Kirby-Bauer disc diffusion test methods Bauer et al., (1996). Interpretation of result was done using the zone of inhibition sizes according to standard of NCCLS (2002).

III. RESULTS AND DISCUSSION

RESULTS

Morphological and biochemical characteristics of isolates

Table 4.1 shows the morphological and biochemical characteristics of bacterial isolates obtained from urine samples of subjects within Ikot Ekpene Senatorial District. The table shows the results of biochemical test used for the identification and characteristics of bacterial isolates.

Frequency occurrence and percentage frequency of occurrence of bacterial isolates

Table 4.2 shows the bacterial frequency of occurrence and percentage frequency of occurrence from urine samples obtained from different hospitals in Ikot Ekpene Senatorial District. The isolates includes Enterococcus sp, Escherichia coli, Staphylococcus sp, Streptococcus sp, Proteus sp and Klebsiella sp. Enterococcus sp, recorded percentage frequency occurrence of 28(27.7%) as the highest, followed by Escherichia coli which had 27(26.7%), Staphylococcus sp had 16(15.5 %), Proteus sp had 15(14.9%), Klebsiella sp recorded 12(11.9%) while Streptococcus sp recorded the lowest percentage occurrence of 3(2.9 %).

Summary of urinalysis status of all urine samples

Table 4.3 shows the results of urinalysis of urine samples, those with pH of less than and equal to 7.5 had the highest percentage of 42.9 % while the least pH was seen among those with 7.0 - 7.5. Those positive to Ascorbic acid had 88.3 %. There was a trace presence of glucose at about 89.6% of the subjects.

Macroscopic and Microscopic examination of urine samples

Table 4.4 shows the result of macroscopic and microscopic examination of the urine samples obtained from different hospitals in Ikot Ekpene Senatorial District. In urine colour, the milky white had the highest percentage with 19.5% while the least was seen in the cloudy red with 2.5 6%. There was a high presence of yeast cells with 80.5% while bacteria was low with 68.8%.

Antibiotic sensitivity pattern of Gram positive disc on the bacteria isolates

Table 4.5 shows the antibiotic sensitivity pattern of Gram positive disc on the bacterial isolates obtained from different hospitals in Ikot Ekpene Senatorial District.

The result here shows such drugs as Streptomycin (S), Gentamycin (CN), Levofloxacin (LEV), Chloramphenicol (CH) and Erythromycin (E) as being very effective on the isolates while Chloramphenicol (CR) was quite low in potency on the isolates.

Antibiotic sensitivity pattern of Gram negative disc on the isolates

Table 4.6 shows the antibiotic sensitivity pattern of Gram negative disc on the bacterial isolates obtained from different hospitals in Ikot Ekpene Senatorial District.

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The result reveals that Gentamycin (CN), Reflacine (PEF), Ciproflox (CPX), Augmentin (AU) and Ceporex (CEP) were quite effective as most of the isolates were sensitive to them but resistant to Streptomycin (S), Ampicilin (PN) and Tarivid (OFX).

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Table 4.1 Morphological and biochemical characteristics of bacterial isolates

Isolates Morphological Characteristics	Cells Shape	Grain reaction	Catalase	Coagulase	Oxidase	Citrate	Urease	Sugar Fermentation: Motility	Spores	MR	VP	Lactose	Sucrose	Glucose	Manitol	Galactose	Probably organisms
Circular, raised, shiny	Short rods in chains	+	-	-	-	-	-	+	-	-	+	AG	AG	AO	AO	AO	Enterococcus sp
Irregular, raised, greenish, shiny and opaque	Rods	-	+	-	-	-	-	+	-	-	-	AG	AG	AG	AG	AG	Escherichia coli
Spindle, flat, yellow, dull and opaque	Cocci in cluster	+	+	-	-	-	+	-	-	+	-	AG	AG	AG	AG	AG	Staphylococcus sp
Purification, flat, whitish shiny and transparent	Cocci in chain	+	-	-	-	-	-	-	-	+	-	AO	AG	AG	AO	AG	Streptococcus sp
Irregular,umbonate,dull, creamy, slimy and opaque	Rods	-	+	+	-	+	+	+	-	+	-	OO	OO	AG	OO	OO	Proteus sp
Oval, convex, shiny, whitish-blue and transparent	Rods	-	+	+	-	+	+	-	-	-	+	AG	AG	AG	AG	OO	Klebsiella sp

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Keys :
+ = Positive
- = Negative

AG = Acid and Gas Production
AO = Acid , but no Gas
OO = No Acid No Gas

Table 4.2 Bacterial isolates frequency of occurrence and percentage frequency occurrence (%)

Bacterial Isolates	Frequency of Occurrence n=101	Percentage Frequencies (%)
Enteroccoccus sp	28	27. 7
Escherichia coli	27	26.7
Staphylococcus sp	16	15.8
Streptococcus sp	3	2.9
Proteus sp	15	14.9
Klebsiella sp	12	11.9

Table 4.3 Summary of urinalysis status of all subjects

Parameters evaluated	Samples analysed n=77	Percentage (%)
pH		
<7.0	31	40.3
7.0 – 7.5	13	16.9
> 7.5	33	42.9
Protein mg/dl(gl)		
Negative	42	54.5
Trace	17	22.1
30mg/dl	10	12.9
>30mg/dl	8	10.4
Nitrate		
Positive	2	2.6
Negative	6	88.3
Trace	8	9.1
Blood (RBC/µl)		
Negative	49	63.6
<10	10	12.9
RBC	18	23.4
Ascorbic Acid		
Negative	9	11.7
Positive	68	88.3
Ketone		
Negative	76	98.7
<0.5	1	1.3
Bilirubin		
0.1-5	3	3.9
Glucose		
Trace	69	89.6
Negative	8	10.4
Urobilinogen		
0-1 -5	13	16.9
6 -12	6	7.8

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Negative	58	75.3

Table 4.4 Macroscopic and microscopic evaluation of urine sample

Parameters evaluated	No. of samples analyzed n=77	Percentage (%)
Urine colour	15	19.5
Milky white	9	11.7
Deep yellow	8	10.4
Cloudy yellow	13	16.9
Pale amber	17	9.1
Yellowish	11	14.3
Straw	12	15.5
Reddish brown	2	2.6
Cloudy red		
Pus Cells		
+++	11	14.3
++	18	23.4
+	48	62.3
Cast Cells		
Cellular cast	9	11.6
Granular cast	15	19.4
Waxy cast	11	14.3
Hyaline cast	42	54.5
Yeast Cells		
++	15	19.5
+++	62	80.5
Crystals		
Cholesterol	37	48.1
Cystine	15	19.5
Calcium oxalate	25	32.5
Bacteria		
+	53	68.8
++	24	31.4
Epithelial Cells		
++ +	8	10.4
++	21	27.3
+	48	62.3
Red Cells		
+++	18	23.4
++	10	12.9
+	49	63.3

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Table 4.5 Antibiotic susceptibility test of Gram positive disc Gram positive commercial disc (mm)

Types of Antibiotics Zone of Inhibition (mm)

ISOLATES	S	CN	CH	LEV	APX	AMX	RD	E	NB	CPX
Enterococcus sp	28.5	24.5	12.0	25	21.5	23.5	27.5	22.5	18.5	17.5
Staphylococcus sp	23	23.5	13.0	34	30	18.0	24	29.5	7	25
Streptococcus sp	18	26.5	12.2	23.5	17.5	17.0	20	26	9	18

KEY:

Sensitive ≥ 18mm
Resistance ≤ 13mm
NB: Norfloxacine 10mcg
RD: Rifampicin 20mcg
E: Erythromycin 30mcg
CPX: Ciprofloxacin 10meg
CH: Chloramphenicol 20mcg
S: Streptomycin 30mcg
CN: Gentamycin 10mcg
AMX: Amoxil 20mcg
APX: Ampiclox 20mcg
LEV: Levofloxacin 30mcg

Table 4.6 Antibiotic susceptibility test of Gram negative disc Gram negative commercial disc (mm)

ISOLATES	CN	S	PN	SXT	PEF	CPX	OFX	AU	CEP	NA
Proteus sp	25	16.0	12	24	26.5	27.5	17.5	23	28	24.5
Escherichia coli	27.5	7	12	17.5	27.5	29	9.0	26	24	7
Klebsiella sp	26	7	13	17.5	23	27	12.0	25.5	21.5	8

KEY:

Sensitive ≥ 18mm
Resistance ≤ 13mm
CEP: Ceporex 10mcg
OFX: Tarivid 20mcg
NA: Nalidixic acid 20mcg
PEF: Reflacine 20mcg
CN: Gentamycin 10mcg
AU Augmentain 20mcg
CPX: Ciproflox 10mcg

SXT:	Septrin	30mcg
S:	Streptomycin	30mcg
PN	Ampicilin	20mcg

IV. DISCUSSION OF RESULT

The results of the analysis of incidence of urinary tract infection among male diabetic patients in Ikot Ekpene Senatorial District revealed the present of bacterial isolates to include Enterococcus sp, Escherichia coli, Staphylococcus sp, Streptococcus sp, Proteus sp and Klebsiella sp. Enterococcus sp recorded the highest frequency of occurrence and percentage occurrence of 28(27.7%), followed by Escherichia coli which had 27(26.7%), Staphylococcus sp had 16(15.5%), Proteus sp had 15(14.9%), Klebsiella sp recorded 12(11.9%) while Streptococcus sp recorded the lowest percentage occurrence 3(2.9%) respectively. The result of the bacterial isolates of this work is in line with the work of Meiland et al.,(2016).

Enterococcus are facultative anaerobic organisms, and they are capable of cellular respiration in both oxygen-rich and oxygen-poor environments. Important clinical infections caused by Enterococcus include urinary tract infections, bacteremia, bacterial endocarditis, diverticulitis, and meningitis. Urinary tract infections can be treated specifically with nitrofurantoin, even in cases of vancomycin resistance. Sievert et al., (2013) reported the isolation of Enterococcus sp from urinary tract of diabetic patients and are factor contributing to the cases of urinary tract infection among diabetes patients. From a medical standpoint, an important feature of this genus is the high level of intrinsic antibiotic resistance. Some Enterococci are intrinsically resistant to 13-lactam-based antibiotics (Penicillins, Cephalosporins, Carbapenems), as well as many Aminoglycosides (Bonadio et al., 2001). Vijan, (2010) reported high resistant of Enterococcus sp in a diabetes patients having urinary tract infection due to exposure to anti-diabetes drugs in the treatment of diabetes.

E. coli virulent strains can cause gastroenteritis, urinary tract infections, neonatal meningitis, hemorrhagic colitis, and Crohn's disease. Common signs and symptoms include severe abdominal cramps, diarrhea, hemorrhagic colitis, vomiting, and sometimes fever. Virulent strains are also responsible for bowel necrosis (tissue death) and perforation without progressing to hemolytic-uremic syndrome, peritonitis, mastitis, septicemia, and Gram-negative pneumonia. Raz, (2000) reported that E. coli are responsible for urinary tract infection among pregnant women who are diabetes. The study further revealed that out of fifty diabetic women and fifty non-diabetic patients subjected to clinical analysis thirty five (35) were reported to have urinary tract infection, therefore he concluded that diabetes are co-factor of urinary tract infections.

Karlowsky et al., (2011) reported that very young children are more susceptible to develop severe illness, such as hemolytic uremic syndrome, however, healthy individuals of all ages are at risk to the severe consequences that may arise as a result of being infected with E. coli when they are been breast feed by diabetic patients. Klebsiella species are routinely found in the human nose, mouth, and gastrointestinal tract as normal flora; they can also behave as opportunistic human pathogens. Klebsiella species are known to also infect a variety of other animals, both as normal flora and opportunistic pathogens. Hooton (2010) reported the presence of Klebsiella species in urine and stool sample among women having urinary tract infections. Hooton (2010) therefore concluded that that Klebsiella are among the pathogenic bacteria responsible for urinary tract infection since 85%, out of 100 tested samples turn out to be Klebsiella positive.

Harding et al., (2012) reported that Klebsiella contributed to wide range of diseases including pneumonia, urinary tract infections, septicemia, meningitis, diarrhea, and soft tissue infections. Staphylococcus species are responsible for many infections, Staphylococci can infect tissues when the skin or mucosal barriers have been breached. Staphylococci can cause many forms of infection such as deep-seated infections, such as osteomyelitis and endocarditis and more serious skin infections (furunculosis cause of hospital acquired (nosocomial) infection of surgical wounds and, infections associated with indwelling medical devices toxic shock syndrome by release of superantigens into the blood stream etc (Gupta et al., 2011).

The results of urinalysis of urine samples obtained from different hospitals in Ikot Ekpene Senatorial District shows that urine samples were positives to pH, protein, blood, ascorbic acid, keton, bilirubin, urobilinogen. The study revealed that urinalysis of diabetic patients within Ikot Ekpene which could as a result of the presence of the bacteria. These

bacteria such as Enterococcus sp, Escherichia coli, Staphylococcus sp, Streptococcus sp and Klebsiella sp were reported by Bonadio et al., (2001) to be responsible for urinary tract infection. The urinalysis result of this study is in line with the work Rubin et al,. (2012) who also recorded positives in urine of hospitalized who are immuno-compromised.

Significantly, these organisms are considered pathogenic to human and are considered a co-infector in diabetic pathogen. It also weaken the immune system of the person thereby serving as an opportunistic pathogens as reported by Kofteridis et al., (2009). The result of macroscopic and microscopic examination of the urine samples like urine colour, included milky-white and cloudy red. The result shows that all the urine samples contain one or more substance which indicates an infection of the donor. The presence of the parameters in urine indicates sign of urinary traction infection as pyelonephritis, cystitis etc as reported by Colgan et al., (2011) who study the pyelonephritis of men of advance age and reported it to be associated with high blood sugar.

The result of this macroscopic and microscope analysis of urine sample is in agreement with the work of Zhanel et al., (2011) who also examine the above listed feature in the urine sample of above 75 years of age. The result of the sensitivity pattern of Gram positive bacteria against Gram positive disc reveals that Enterococcus sp were all sensitive to all the tested antibiotics, Staphylococcus sp and Streptococcus sp were sensitive to all antibiotics except amoxil (AMX) and norfloxacin (NB). The study shows that the isolates were highly sensitive to the antibiotics and could be use as a first line drugs for the treatment of infection caused by these organisms.

The result of the sensitivity pattern of Gram negative bacteria against Gram negative disc reveals that Proteus sp was sensitive to all the tested antibiotics, Escherichia coli was also sensitive to all antibiotics except Ceprox (CEP), Ampicilin (PN), Tarivid (OFX) and Nalidixic acid (NA), while Klebsiella sp was sensitive to all antibiotics exception of Ceprox (CEP) and Nalidixic acid (NA). The study shows that the isolates were highly sensitive to the antibiotics. The sensitivity result of this study is higher than the sensitivity result of Harris, (2009) using commercial antibiotics disc against bacteria isolated obtained from stool and urine of immunocompromised persons. The variation in the rate of the antibiotic is responsible as a result of exposure to antibiotics either directly or indirect. Therefore, this study suggested that urine samples of diabetic patient contain bacteria which are pathogenic in nature. The presence of the bacteria isolates altered the content of the urine sample as indicated in the tested samples.

V. STATISTICAL ANALYSIS

Datas were analysed using the IBM statistical package for social services (IBM SPPS, USA) for window version 20. T-test and 95% confidence internal (95% cl) were calculated for each donor. The p-value of ≤ 0.05 was considered statistically significant.

VI. CONCLUSION AND RECOMMENDATIONS

CONCLUSION

Based on the above analysis it could be concluded that diabetic urine samples contain some pathogenic bacteria which are associated with urinary tract infections. The presence of the bacteria altered the normal physiological parameters of the urine, thereby indicating signs and symptoms of urinary tract infection. They could also be concluded that men in Ikot Ekpene Senatorial District who are diabetic have higher chance of developing urinary tract infection since the urinalysis, the macroscopic and microscope analysis of the study reveals an abnormalities such as blood, ascorbic acid, keton, bilirubin, urobilinogen in the urinalysis while the urine examination include milky white, cloudy red, straw, presence of pus cells, granular cast, waxy cast, yeast cells, crystal and epithelial cells.

RECOMMENDATIONS

The following recommendations were made from the result of this study:

- Urinalysis should be conducted regularly on diabetic patients.
- Proper medications for the tract of urinary tract infection should be administered to diabetic patients.
- Diabetic patients who developed urinary tract infection should visit health care centre for the serves of a professional doctor and to avoid self medication in order to avoid more damage to the patients system.
- Government should make provision for a free medical treatment for person living with

diabetes as this is the get way for opportunist infection to develop.

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