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RELATIONSHIP BETWEEN SOME EPIDEMIOLOGICAL FACTORS AND ACUTE PYELONEPHRITIS IN AFIKPO AND ABAKALIKI, EBONYI STATE, NIGERIA.

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Abstract:

A study of the relationship between some epidemiological factors and acute pyelonephritis was conducted in Afikpo and Abakaliki, Ebonyi State. Mater Miscericodeae Hospital, Afikpo and Federal Medical Centre, Abakaliki were used for the work. Patients' data and the clinical examinations were employed in this study. The highest age relationship was seen in ages 71-80 years in both areas wither a percentage occurrence of 85.0% in Afikpo and 82.5% in Abakaliki and the least in ages 11-20 with 62.5% prevalence in both areas. Females had higher relationship than males in both areas with Afikpo showing 91.1% prevalence in females and 63.9% in males. However, Abakaliki had 86.8% prevalence in females and 60.0% in males. The highest occupational occurrence in Afikpo was 84.0% among those not working and in Abakalik 92.0% among drivers; but the least was observed among quarry workers in both areas with Afikpo and Abakaliki showing 30.0% and 40.0% prevalence respectively. Comparison of educational status and the disease showed un-educated presenting the highest relationship in both areas with the prevalence of 90.0% in Afikpo and 72.0% in Abakaliki. But the least was observed among those of tertiary status with the prevalence of 50.0% in each of the two areas. Among pathological factors assessed, the highest occurrence of acute pyelonephritis was observed in people with urinary incontinence who had 92.0% prevalence in Afikpo and people with bladder infection that had 90.0% prevalence in Abakaliki; while the least occurrence was observed in persons with sickle cell disease 45.0% in Afikpo 44.0% in Abakaliki. Pregnancy showed 73.5% and 68.0% prevalence in Afikpo and Abakaliki respectively; while previous history of family UTI showed 40.0% prevalence in Afikpo and 41.0% in Abakaliki. This research work reveals that relationship exists between age, sex, educational status, occupation, diabetes mellitus, bladder infection, urinary incontinence, HIV pregnancy, bladder surgery, use of catheters and prostate enlargement and acute pyelonephritis.

Keywords: ***Epidemology, Acute pyelonephritis, Afikpo and Abakaliki.***

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INTRODUCTION:

Pyelonephritis is an infection of the ascending urinary tract that has reached the pelvis of the kidney. It is taken from two Greek Words "pyelum" and "nephros". Pyelum refers to the pelvis while nephros is the Greek word for kidney. It can also be called pyelitis [1].

Knott (2007) [2], stated that the usual organisms associated with pyelonephritis are the same as for lower urinary tract infection (example *Escherichia, Klebsiella, Proteus* and *Enterococcus*).

Acute pyelonephritis is considered uncomplicated if the infection is caused by a typical pathogen in an immuno-competent patient who has normal structural urinary tract and renal function. Misdiagnosis can lead to sepsis, renal abscesses, and chronic pyelonephritis that may cause secondary hypertension and renal failure [3].

Sepsis refers to a systemic inflammatory response syndrome due to Section. The source of sepsis is often ascending infection from the bladder but haematogenous spread can also occur [1].

Pyelonephritis is uncommon in men with a normal urinary tract, but common in young girls and in pregnant women after instrumentation or bladder catheterization [4]. Acute pyelonephritis affects mostly people of the productive age usually 18-40 years [5]. Acute pyelonephritis in children usually occurs as a result of urinary tract infection with vesicourethral reflux and represents the most severe type of tract infection. The inflammatory changes of acute pyelonephritis are reversible and cause no renal scarring in most cases. However in the other cases results in irreversible renal scarring leading to hypertension and chronic renal failure [6].

A number of studies have shown that many women, who initially present with lower tract symptoms, actually have pyelonephritis. This group of young women is often identified when short-course therapy for uncomplicated cystitis fails. In the extremes of age, the presentation may be so atypical that the signs -d symptoms of pyelonephritis are not noticed. In the infants, the presentation may be difficulty in feeding or fever. In the elderly, the presentation may be mental status change or fever [7].

Objectives of the Study

The objectives of this research work include:

1. To determine the epidemiology of acute pyelonephritis with respect to age, sex occupation and other epidemiological factors.
2. To ascertain the relationship between some pathological factors and the .5 ease condition.
3. To provide a baseline information for further research.

MATERIALS AND METHODS:

Sample Area

The samples for this research work The samples for this research work were collected from boys, girls, men and women of all ages that presented symptoms of upper urinary tract infection who attend Federal Medical Center, Abakaliki and Mater Miscericodeae Hospital
Afikpo.

Study Population

Five hundred and sixty patients were examined in each of the hospitals as rey come to the hospitals using their clinical presentations.

Methods

The methods that were used in this research include:

Personal Data of Patients

This was used to access some vital information which includes:

- **Host factor** like: age, gender, occupation, educational status, immuno

satus, pregnancy, previous family history of UTI.

- **Pathological factors** like: diabetes mellitus, concurrent bladder

infections, urinary incontinence, use of catheters, previous bladder
surgery, and prostate enlargement.

Clinical Examinations

Clinical examination of patients was done. The steps involved in the
clinical examination include physical examination involving the check of the
following:

- Vital signs - temperature; blood pressure
- Patients' appearance
- Abdominal examination
- Pelvic examination

These were done during the examination of patients in search for symptoms suggesting upper urinary tract infection;; symptoms like high fever, ;hills, flank or back pain, nausea, vomiting, rigors, increased urination frequency and urgency, pyuria, and costovertebral angle tenderness. The patients were clinically examined for these signs and symptoms with the taking of the patients' history after which the suspected cases were further referred for urinalysis and other confirmatory tests.

Statistical Analysis

The data from this research work was subjected to Chi-square test statistics. P values less than 0.05 ($p < 0.05$) proves a significant relationship.

RESULTS:

The highest occurrence of acute pyelonephritis was within the ages of 71-80 years from both areas with their percentage occurrences being 85.0% in Afikpo and 82.5% in Abakaliki while the least occurrence

was between the ages of 11-20 being 62.5% in Afikpo and'62.5% in Abakaliki (Figure 1 and Appendix l).

Females also showed a higher percentage occurrence than males i.e. 91.1% in Afikpo and 86.8% in Abakaliki for females but 63.9% males in Afikpo and 60.0% in Abakaliki for males (Figure 2 and Appendix 1).

Using the level of education, the highest occurrence in both Afikpo and

Abakaliki areas was within those who were uneducated 90.0% in Afikpo and

72.0% in Abakaliki and the least among those of tertiary qualification from both

areas with Afikpo showing the occurrence of 50.0% and Abakaliki 45.0%

Figure 3 and Appendix 1).

In the occupational distribution of acute pyelonephritis, the highest occurrence of the disease in Afikpo was among those not working who had 84.0% prevalence with the least among quarry workers 30.0%; unlike in Abakaliki where the highest occupational occurrence was among drivers 92.0% and the least among quarry workers 40.0% (Figure 4, and Appendix 1).

Figure 5 and Appendix 2 showed that the highest relationship among the pathological factors in Afikpo area occurred among those with urinary incontinence 92.0% while the least relationship occurred in those with sickle cell anaemia 45.0%. The relationships among other pathological factors are as follows: diabetes mellitus 80.0% use of catheters 81.5%, prostate enlargement 87.0%, bladder infection 88.5%, bladder surgery 68.0% and HIV 70.0%.

However in Abakaliki area, the highest relationship among the pathological factors occurred among those with bladder infection 90.0% and the least with sickle cell anaemia 44.0%. Others showed relationships as follows: diabetes mellitus 87.5%> urinary incontinence 85.0%, use of catheter 75.0%. prostate enlargement 78.0%, bladder surgery 50.0% and HIV 74.0%.

Also, pregnancy to have (73.5%) prevalence in Afikpo and (68.0%) in Abakaliki; the previous history of family UTI showed (40.0%) occurrence of acute pyelonephritis in Afikpo and (41.0%) in Abakaliki.

Both sickle cell disease and history of family UTI show no significant relationship (P>0.05).

Table 1: Relationship between some Epidemiological Factors and Acute Pyelonephritis

Factor age	**Afikpo No Examined**	**No of positive (%)**	**Abakaliki No Examined**	**No positive (%)**
11-20	80	50(62.5%)	80	50(62.5%)
21-30	80	62(77.5%)	80	55(68.7%)
31-40	80	64(80.0%	80	61(76.2%)
41-50	80	65(81.2%)	80	65(81.2%)
51-60	80	60(75.0%)	80	52(65.0%)
61-70	80	65(81.2%)	80	62(77.5%)
71-80	80	68(85.0%)	80	66(82.5%)
Sex				
Male	280	179(63.9%)	280	168(60.0%)
Female	280	255(91.1%)	280	243(86.8%)
Occupation				
Students	50	35(70.0%)	50	40(80.0%)
Farmers	50	36(72.0%)	50	32(64.0%)
Traders	50	37(74.0%)	50	35(70.0%)
Drivers	50	35(70.0%)	50	46(92.0%)
Quarry workers	50	15(30.0%)	50	20(40.0%)
Civil servants	50	25(50.0%)	50	27(54.0%)
Not working	50	42(84.0%)	50	37(74.0%)
Educational Status				
Not educated	100	90(90.0%)	100	72(72.0%)
Primary School	100	70(70.0%)	100	67(57.0%)
Secondary School	100	60(60.0%)	100	56(56.0%)
Tertiary School	100	50(50.0%)	100	45(45.0%)

Table 2: Relationship between some Pathological Factors and Acute Pyelonephritis

Factors	No Examined	Afikpo No Positive	No Examined	Abakaliki No Positive(%)
Diabetes Mellitus	200	160(80.0%)	200	175(87.5%)
No Diabetes Mellitus	200	102(52.0%)	200	130(65.0%)
Urinary Incontinence	200	100(50.0%)	200	170(85.0%)
Use of Catheter	200	163(81.5%)	200	124(62.0%)
Non Use of Catheter	200	119(59.5%)	200	150(75.0%)
Prostate Enlarge	100	87(87.0%)	100	103(51.5%)
No Prostate Enlargement	100	52(52.0%)	100	78(78.0%)
Bladder Infection	200	177(88.5%)	200	50(50.0%)
No Bladder Infect	200	53(26.5%)	200	180(90.0%)
Bladder Surgery	200	136(68.0%)	200	78(39.0%)
No Bladder Surgery	200	170(85.0%)	200	100(50.0%)
Sickle Cell	100	45(45.0%)	100	164(82.0%)
No Sickle Cell	100	60(60.0%)	100	44(44.0%)
HIV	100	70(70.0%)	100	74(74.0%)
No HIV	100	40(40.0%)	100	42(42.0%)

Table 3: Relationship between Acute Pyelonephritis and Other Factors

Factors	Afikpo No Examined	No Positive(%)	No Examined	Abakaliki No Positive
Pregnancy	200	147(73.5%)	200	136(68.0%)
No Pregnant	200	83(41.5%)	200	82(41.0%)
Previous History of UTI	100	40(40.0%)	100	41(41.0%)
No Previous Family History of UTI	100	43(43.0%)	100	45(45.0%)

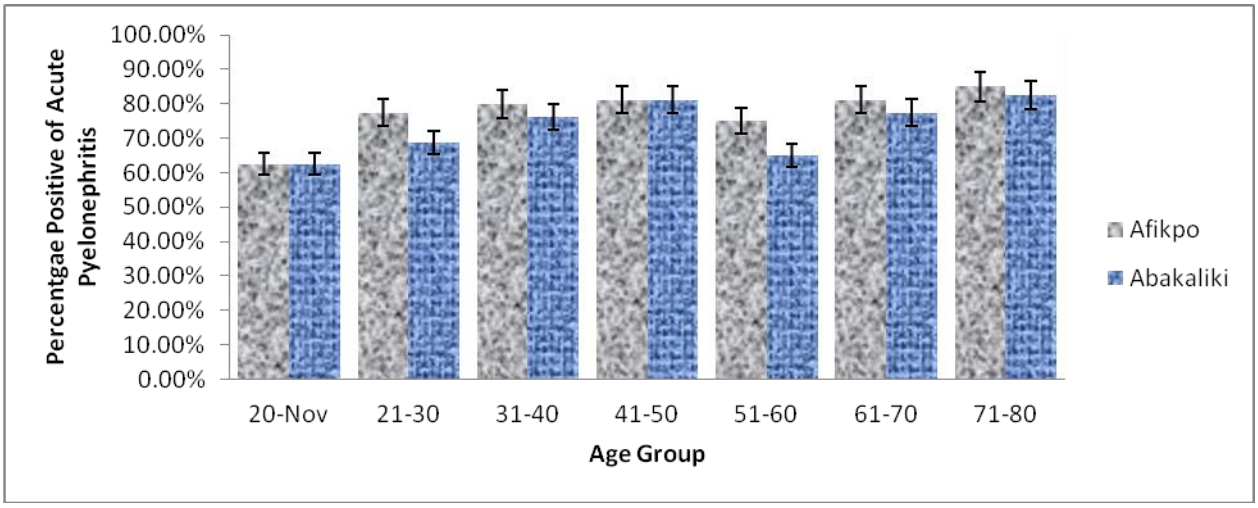

Fig 1: A Multiple Bar Chart of Percentage Positive of Acute Pyelonephritis According to their Age Group

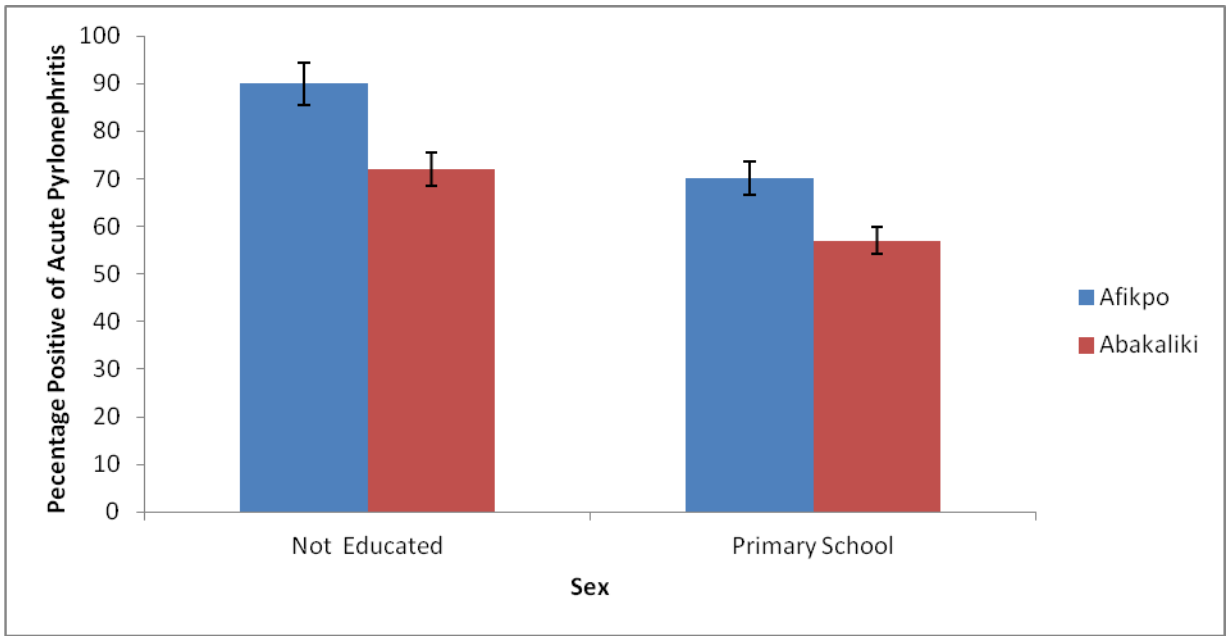

Fig 2: A Multiple Bar Chart of Percentage Positive of Acute Pyelonephritis According to their sex

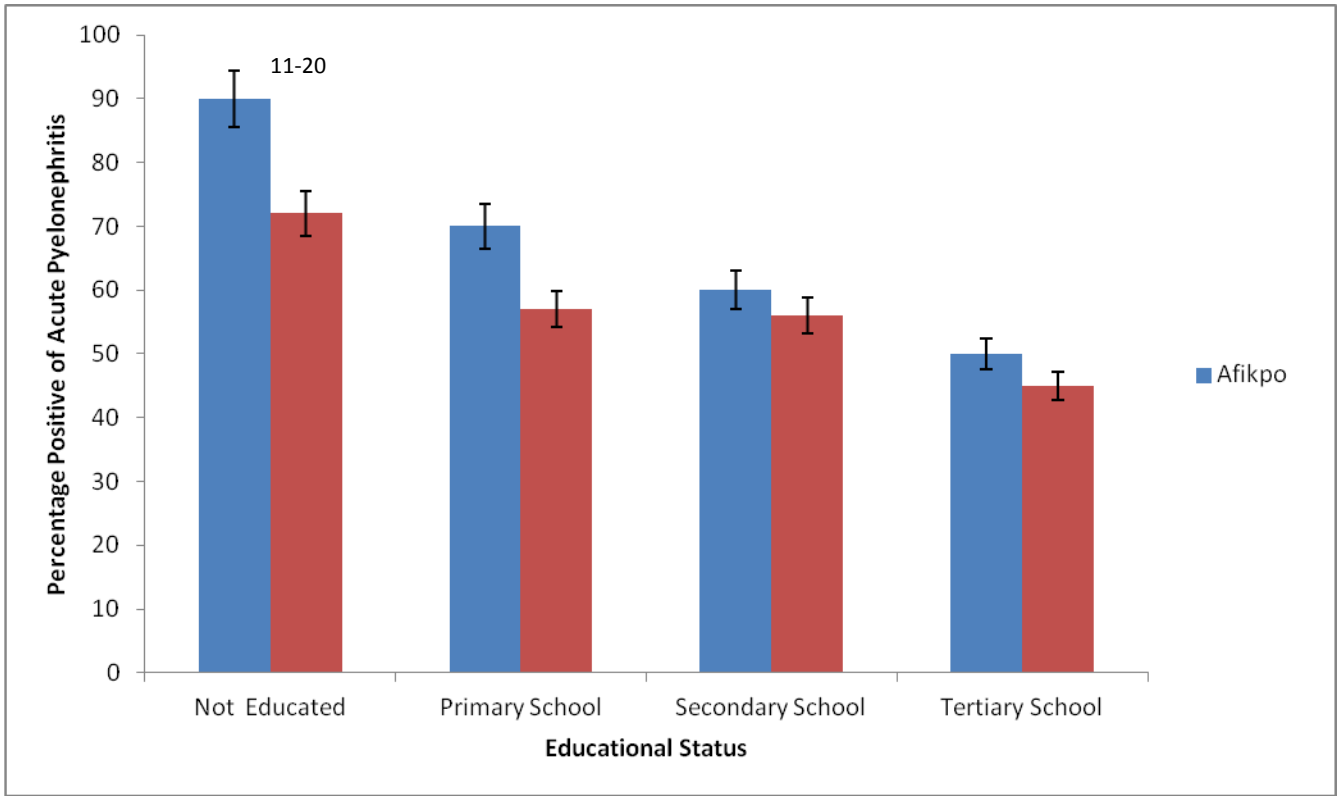

Fig 3: A Multiple Bar Chart of Percentage Positive of Acute Pyelonephritis According to their educational status

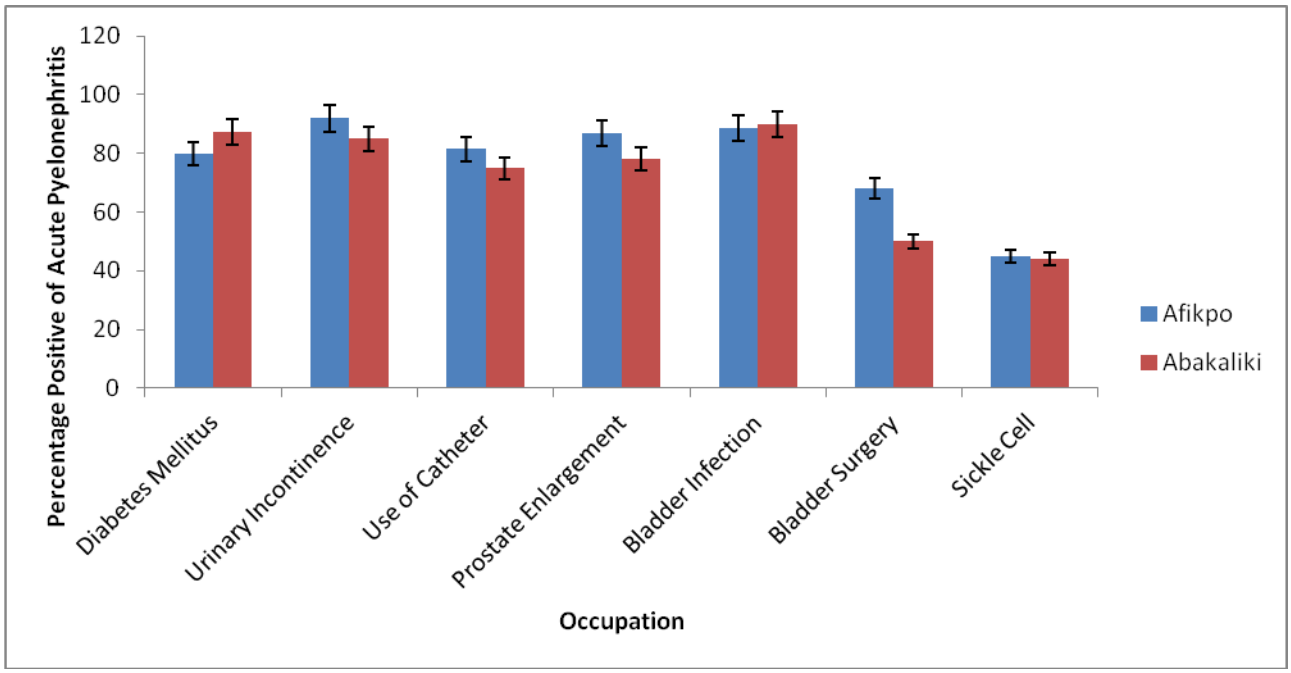

Fig 4: A Multiple Bar Chart of Percentage Positive of Acute Pyelonephritis According to their ocupation

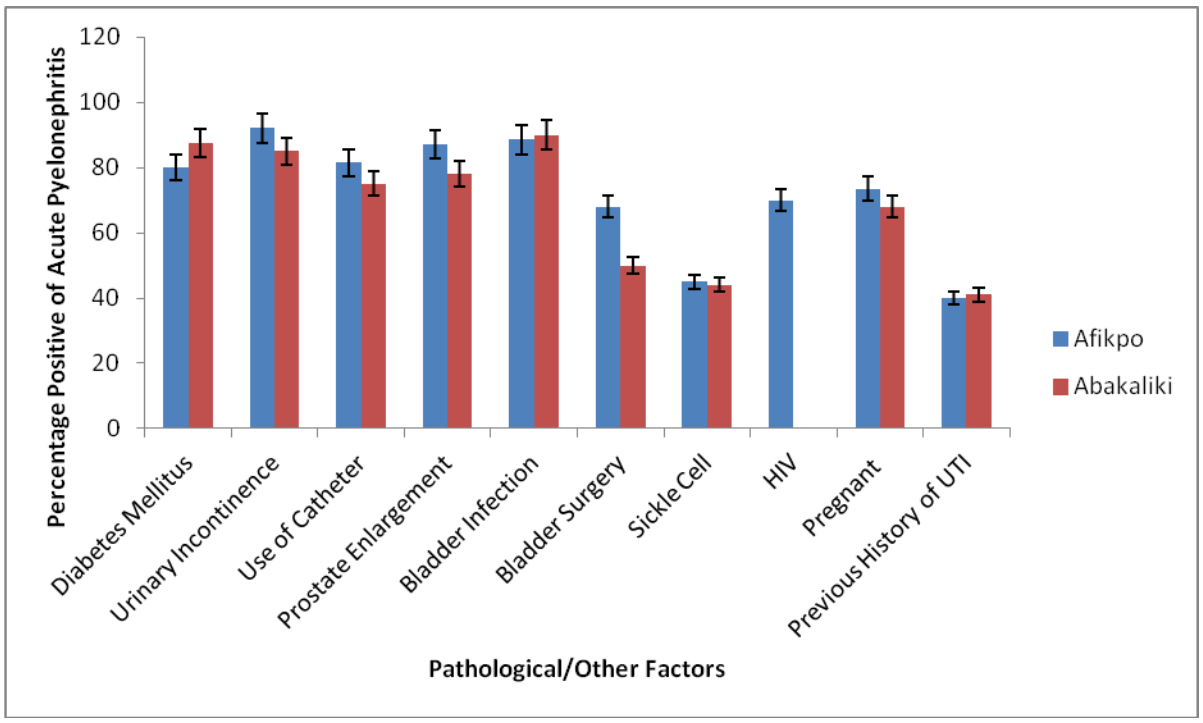

Fig 5: A Multiple Bar Chart of Percentage Positive of Acute Pyelonephritis According to their Pathological/Other Factors

DISCUSSION:

The least percentage occurrence of acute pyelonephritis was seen within the ages of 11-20 in both areas studied while the higher percentage occurrence was observed in the ages of 71-80 years (Figure 3 and Appendix 1). This result agrees with the work done by Shoff *et al.* (2007), [7], who showed the highest occurrence of acute pyelonephritis to be in the ages of 65 years and above.

In the sex distribution of acute pyelonephritis, females had a higher percentage occurrence of 91.1% Afikpo and 86.8% in Abakaliki. This is in consonance with the work of Pertel and Haverstock (2006), [5], who found out that females present urinary tract and kidney infections more than males.

The highest occurrence of the disease with respect to occupation according to Figure 6 and Appendix 1 was seen among those not working in Afikpo area showing a prevalence of 84.0%; while in Abakaliki area the highest occupational occurrence of acute pyelonephritis occurred among drivers with a prevalence of 92.0%. This agrees with the work done by Harvey (2007), [8], where he found out that sexual behavior of individuals contribute as a very strong risk factor in the transmission of pyelonephritis. The reason for the highest occupational percentage occurrence in Afikpo to be among those not working is suggested to be due to the settlement pattern in Afikpo area which as suggested gives room to promiscuity.

The drivers which showed the highest occurrence in Abakaliki is suggested to be because these set of people have sexually risky behaviours.

The least occurrence in terms of occupational distribution of the disease was seen among the quarry-workers in both areas with Afikpo showing a prevalence of 30.0% and Abakaliki having 40.0%. The reason for this finding may be attributed to the fact that quarry work is highly stressful and tedious and may not give the people who engage in such occupation chance for careless risky sexual behaviours.

The distribution of acute pyelonephritis according to the educational status showed that the highest percentage occurrence among those not educated with Afikpo recorded 90.0% and Abakaliki 72.0%; and the least among those with tertiary education having 50.0% occurrence of acute pyelonephritis in Afikpo and 45.0% in Abakaliki (Figure 5 and Appendix 1). This is probably due to the fact that the more educated people are more enlightened about the disease and its prevention and control measures.

From Figure 7 and Appendix 2, bladder infection shows the highest occurrence among the pathological factors studies in Abakaliki with a percentage of 90.0% while urinary incontinence showed the highest prevalence rate of acute pyelonephritis in Afikpo with 92.0%. Similarly, NKUDIC (2007), [9], stated that infections in the bladed promote the urinary tract infections.

The lowest relationship as shown in Figure 7 occurred among those with sickle cell disease in both areas. It also showed no significant relationship with acute pyelonephritis ($p < 0.05$). This is suggested to be due to the health condition of this set of persons which would normally compel them to avoid sexually risky behaviours.

Also, we observed that pregnancy showed a significant relationship with acute pyelonephritis in both areas ($p < 0.05$). The percentage occurrences were 73.5% in Afikpo and 68.0% in Abakaliki. According to the study by Pertel and Haverstock (2006), [5], pregnancy increases the risk of urinary tract infections. Shoff *et al.*, (2007), [7], also in his work showed a very high percentage occurrence of acute pyelonephritis among pregnant women. This is probably as a result of hormonal influences during pregnancy which lowers the immune response of such individuals.

Family history of urinary tract infections showed no significant relationship with the acute pyelonephritis ($P > 0.05$). The percentage occurrence as shown in figures 7/Aappendix 1 is 40.0% in Afikpo area and 41.0% in Abakaliki area.

CONCLUSION:

This research work reveals that relationship exists between some epidemiological factors and acute pyelonephritis. The highest age relationship with acute pyelonephritis occurred in ages 71-80 while the least age relationship occurred in ages 11-20. Also, sex, occupation, educational status, previous bladder infection prostate enlargement, HIV, use of catheters, diabetes mellitus, pregnancy, urinary incontinence and bladder surgery had significant relationship with acute pyelonephritis.

On the contrary, sickle cell disease and previous history of family UTI had no significant relationship with acute pyelonephritis.

There is high level of unawreness on the disease acute pyelonephritis is the study areas. All hands must be on deck to fight this life threatening disease. Pyelonephritis though an organ threatening disease condition is preventable.

Recommendations

From the findings of this research work the following recommendations are here by deemed appropriate.

Renal tract check-ups should be carried out at least once a year to help in the early detection of

pyelonephritis and other kidney infections so as to reduce complications from acute pyelonephtitis.

More research works are recommended in this field to help address many questions that could not be answered due to the scope of this work.

Government and institutions should provide grants and other support in this area since no much work has been done on pyelonephritis especially in Nigeria.

There should be organized public forms in the form of seminars, symposia and other means of public enlightenment to help the public know more about acute pyelonephritis.

Parents should start the fight against pyelonephritis early enough by teaching their children good morals. As an addendum, their female children should be taught to clean their genitals from front to back instead of the reverse.

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