

## Asymptomatic bacteriuria in pregnant women at the outpatient clinic of some governmental hospitals in Imo State, Nigeria

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### ABSTRACT

Asymptomatic bacteriuria among pregnant women in Imo State, Nigeria was studied. All pregnant women attending antenatal at Federal Medical Center, Owerri, General Hospital, Okigwe, and Imo State University Teaching Hospital, Orlu, between January and April 2006 and who agreed to enter the study were clinically evaluated to exclude signs of urinary tract infection. Samples of 10-15 ml urine were examined for bacteria, pus cells and parasitic ova. The samples were further cultured on cysteine lactose electrolyte deficient agar and colony counts yielding bacterial growth of  $10^5$  or more of pure isolates were deemed significant. Of the 630 pregnant women, 111 had significant bacteriuria giving a prevalence rate of 17.6%. The highest age-specific prevalence was found in the 31-40 year-olds and the lowest in the 41-50 year-olds. Socioeconomic status of the respondents had effect on the prevalence of bacteriuria and also, there was an increase in the prevalence with increase in age of gestation. The dominant isolates were *Staphylococcus* species and *Klebsiella* species with most of the isolates obtained in respondents from Owerri and Okigwe study areas.

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**Keywords:** Prevalence, Bacteriuria, UTI, Bacteria isolates.

### INTRODUCTION

Urinary tract infection (UTI) is one of the most common reasons for people to seek medical consultation and is also one of the most frequently occurring nosocomial infections (Gupta et al., 2001). Bacteria are most commonly responsible, although yeast and viruses may also be involved. Asymptomatic bacteriuria, in which urine culture reveals a significant growth of pathogens that is greater than  $10^5$  bacteria/ml (Gilbert et al., 2005), but without the patient showing symptoms of UTI, can be found in both pregnant and non-pregnant women. The importance of asymptomatic bacteriuria is a major risk factor for the development of UTI (Al-Haddad, 2005).

In Nigeria, Olusanya et al. (1993) in Sagamu reported a prevalence rate of 23.9%.

Akerele et al. (2001) also reported 86.6% in Benin City. Few studies in Iran have shown that the prevalence of asymptomatic bacteriuria among pregnant women ranged from 6.1% to 10.9% (Shirazi et al., 2006; Hazhir, 2007; Enayat et al., 2008). In Canada, the prevalence rate varies from 4-7%. The prevalence is higher among individuals in lower socioeconomic classes and those with a past history of asymptomatic urinary tract infection, (Nicolle, 1994). The prevalence rate in pregnant women is comparable to the prevalence rate of non-pregnant women, indicating that pregnancy alone does not necessarily incline to the development of asymptomatic bacteriuria. It has been suggested that the frequency of bacteria increases by about 1% during pregnancy (Nicolle, 2003).

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Screening for and treatment of asymptomatic bacteriuria is a standard procedure of obstetrical care and included in most antenatal guidelines. Untreated asymptomatic bacteriuria is a risk factor for pyelonephritis in pregnancy and associated with low birth weight infants (Smail and Vazquez, 2007). Screening for asymptomatic bacteriuria has been included as one of the most cost-effective strategies for maternal and neonatal health in developing countries in a detailed analysis of interventions to achieve the millennium development goals for health (Adam et al., 2005). The present study was designed to screen pregnant women for asymptomatic bacteriuria, to ascertain its prevalence, and to observe the spectrum of urine isolates.

#### MATERIALS AND METHODS

This study was undertaken in three hospitals in Imo State, Nigeria. These are, Federal Medical Center, Owerri, General Hospital, Okigwe and Imo State University Teaching Hospital, Orlu. The study was conducted between January and April 2006.

Six hundred and thirty pregnant women attending antenatal clinic at the three hospitals were included in the study (210 from each hospital). With the aid of a questionnaire, demographic features including age, gestation age of pregnancy and occupation were collected. After being instructed on the correct mode of self-collection of urine sample and the importance of a clean catch of urine, they were provided with sterile universal bottles. Midstream urine samples (10-15 ml) were collected and placed in a cold box. They were examined microscopically for pus cells, bacteria and ova, and then cultured within two hours of collection. Samples that were not cultured within two hours were stored at 4 °C.

Samples were cultured on Cysteine Lactose Electrolyte Deficient (CLED) agar, blood agar and MacConkey agar. Incubation was done aerobically at 37 °C for 18-24 hours. Colony counts yielding bacteria growth of  $10^5$  cfu/ml or more of pure isolates were deemed significant (Enayat et al., 2008). Isolates were identified using standard methods (Forbes, 1998).

#### RESULTS AND DISCUSSION

The study found 111 significant bacteriuria among 630 pregnant women in Imo State, Nigeria, giving a prevalence rate of 17.6%. Rates of 6.1% to 10.9% have been reported in Iran (Shirazi et al., 2006; Hazhir, 2007; Enayat et al., 2008), while Turpin et al. (2007) reported 7.3% prevalence in Ghana. In Nigeria, Olusanya et al. (1993) reported a prevalence rate of 23.9% in Sagamu while Akerele et al. (2001) reported a very high prevalence rate of 86.6% in Benin City. The result of the present study shows a lower prevalence rate compared to that of other authors in Nigeria, although the location of their study in Nigeria may have had a direct effect on the result of the study. However, the result of the present study showed a higher prevalence rate than those obtained elsewhere.

Figure 1 shows the age related prevalence of bacteriuria in the women studied. The highest prevalence rate was observed in the age group 31-40 years and lowest was observed in 41-50 years age group. Statistical analysis (T-test) showed no significant difference between the number of positive bacteriuria in the 21-30 and 41-50 years age group ( $P < 5\%$ ). This agrees with the report of Turpin et al. (2007), which recorded the highest prevalence of 13% in the age group 35-39 years and lowest rate of 0.0% among the 15-19 years age group. However, 15-19 years age group was not included in the present study.

The prevalence of positive bacteriuria increased with increase in the gestation age of pregnancy with more percentage prevalence observed in the third trimester of pregnancy (Figure 2). The lowest prevalence was observed in the first trimester of pregnancy. There was no significant difference in the number of significant bacteriuria in the second and third trimester of pregnancy ( $P < 5\%$ ). The number of significant bacteriuria in the third trimester of pregnancy was significantly higher than that of the first trimester of pregnancy ( $P < 5\%$ ). It has been suggested that the frequency of bacteriuria and the risk of acquiring bacteriuria increases with the duration of pregnancy from 0.8% of bacteriuric women in the 12<sup>th</sup> gestation week to 2% at the end of pregnancy, (Lucas and Cunningham, 2001; Nicolle, 2003).

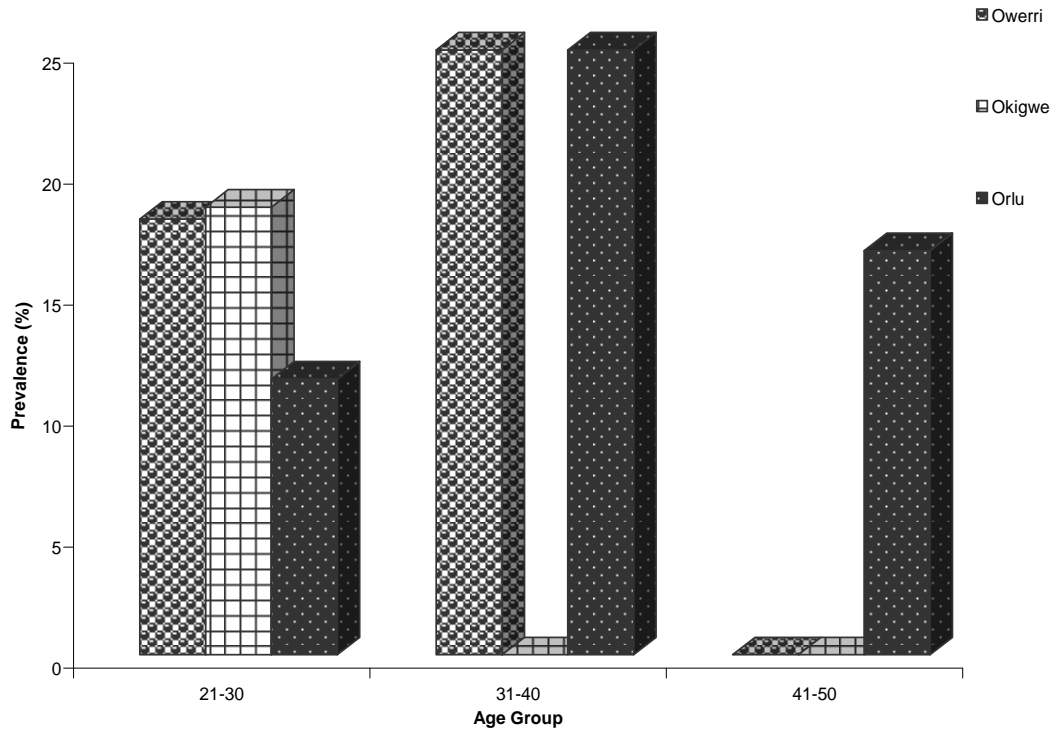


Figure 1: Age group related prevalence bacteriuria.

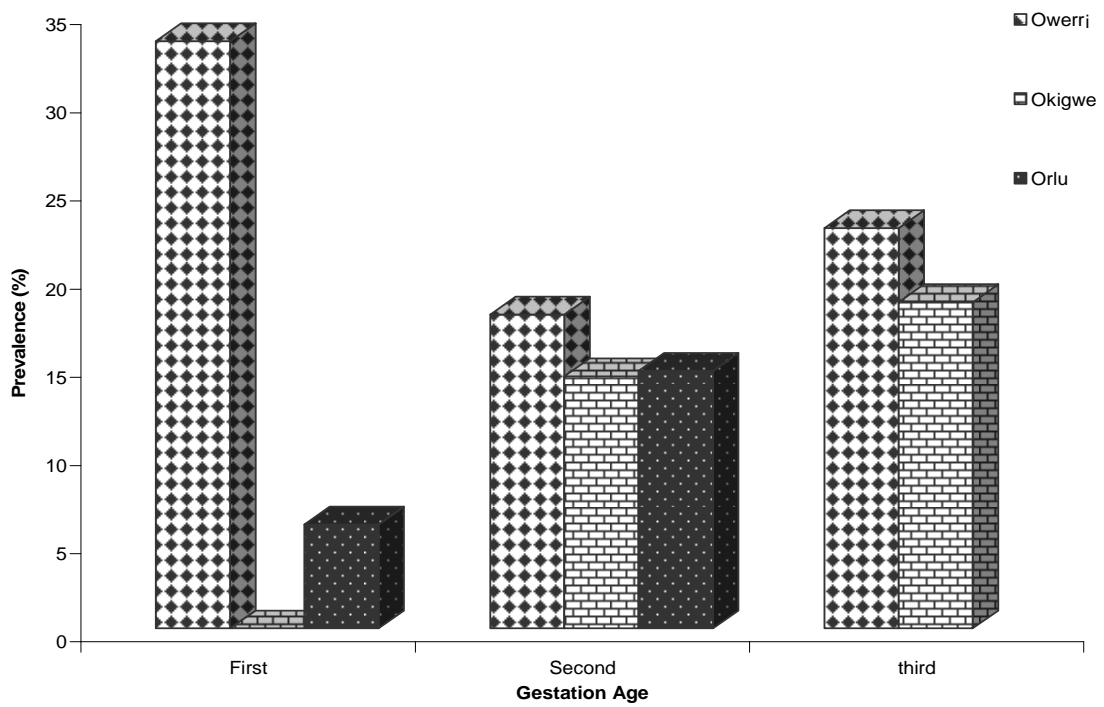
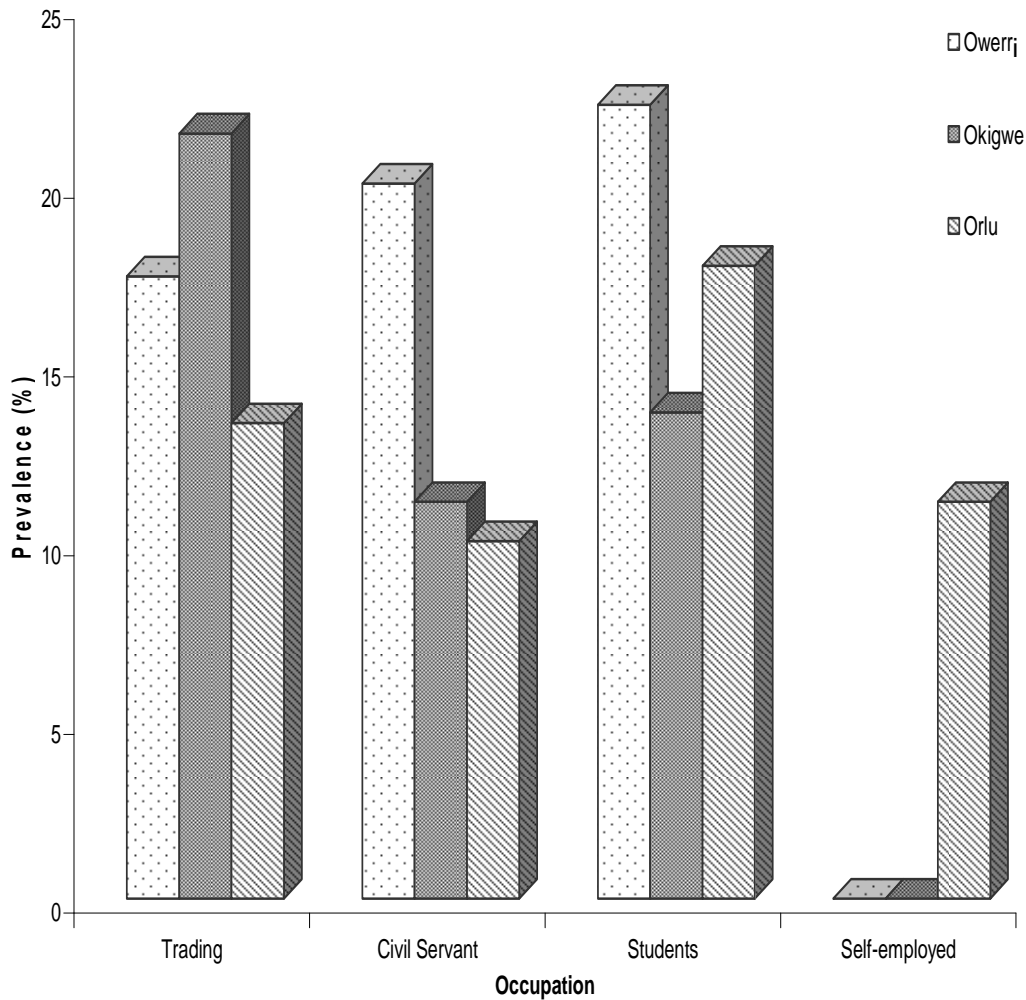


Figure 2: Gestation age related prevalence bacteriuria.



**Figure 3:** Occupational related prevalence bacteriuria.

Generally, students had the highest prevalence of bacteriuria while the self-employed respondents had the lowest prevalence, (Figure 3) and the variation in bacteriuria prevalence is dependent on the socioeconomic status of the respondents (Nicolle, 1994)

The prevalence was also geographical area dependent, with the highest number of significant bacteriuria obtained in Owerri area of study while the least was from Orlu area, (Figure 4). Most significant bacteriuric women in this study from owerri and Okigwe were in the age groups of 21-30 and 31-40 years and most were in their first pregnancies. This could account for the high significant

bacteriuria positives obtained from Owerri and Okigwe study areas.

The dominant organisms were *Staphylococcus* species (43.24%) and *Klebsiella* species (24.32%). *E. coli* and *Proteus* species had prevalence of 21.62% and 10.82% respectively. These organisms were also isolated by Aziz et al. (2006) and Turpin et al. (2007), but *E. coli* was the most prevalent in each case although high prevalence of *Staphylococcus* species were also recorded. However, the study is in consonant with the findings of Masterton et al. (1985) who reported *K. pneumoniae* as second common urine isolate.

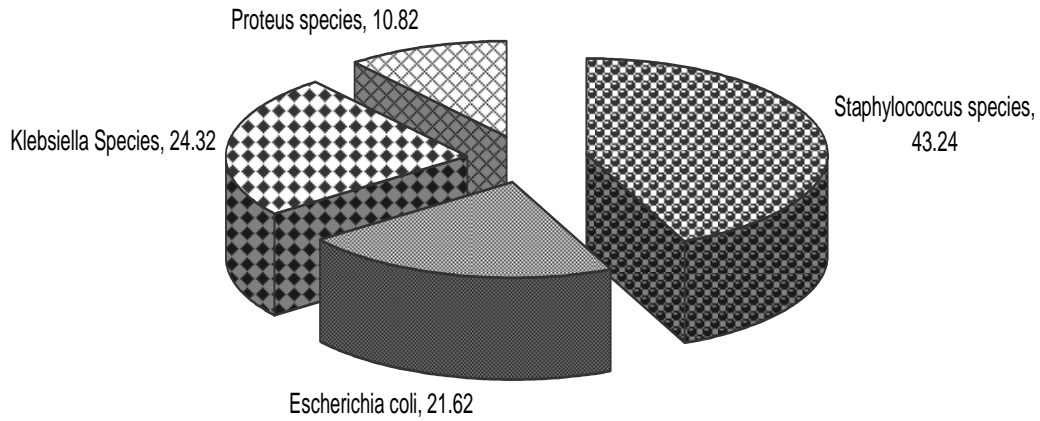


Figure 4: Bacteria isolates.

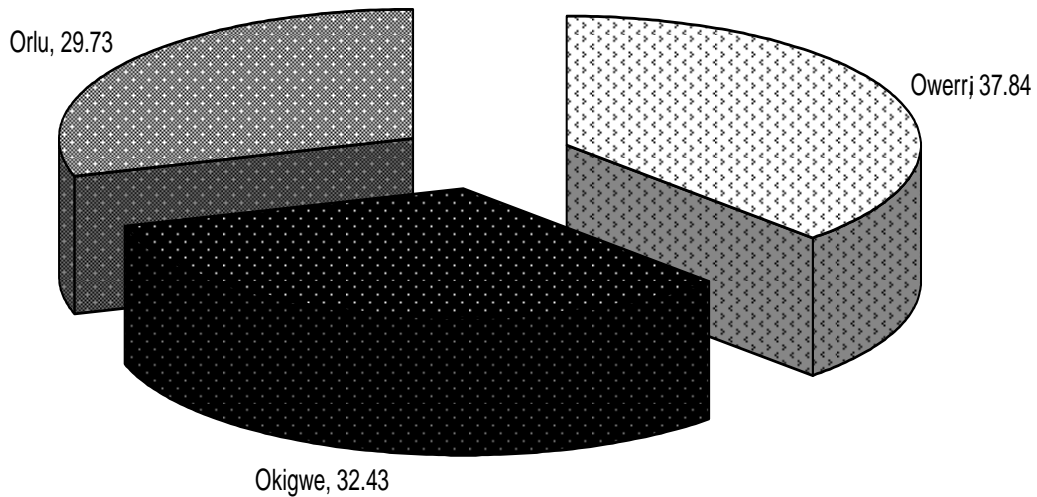


Figure 5: Study area prevalence bacteriuria.

**Conclusion**

Our study showed 17.6% asymptomatic significant bacteriuria in pregnant women on screening by culture. Other studies with similar prevalence of asymptomatic bacteriuria suggest that screening of pregnant women should be done by culture. Organisms recovered in the order of frequency were *Staphylococcus* species, *Klebsiella* species, *E. coli* and *Proteus* species.

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