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RESEARCH PAPER

PREVALENCE AND ASSOCIATION OF ASYMPTOMATIC PROSTATITIS WITH URINARY TRACT INFECTION AMONG APPEARENTLY HEALTHY MEN IN EKPOMA, EDO, NIGERIA

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ABSTRACT

The link between prostatitis and urinary tract infections (UTIs) has been acknowledged but documented incidences of asymptomatic prostatitis remains a course for concern. This study therefore, assesses the prevalence and association of asymptomatic prostatitis with urinary tract infections among apparently healthy men in Ekpoma, Edo State, Nigeria. One hundred adult men (40 – 79 years old) were randomly recruited and subdivided into four age–range subgroups. Urine and blood samples were collected from the subjects and subjected to appropriate laboratory analysis. Results showed that 43 (43%) had significant bacteriuria, and 35 (35%) were positive for prostatitis. *Staphylococcus aureus* had the highest incidence rate (25; 58%) followed by *S. saprophyticus* (16; 37%) and *E. coli* (2; 5%). Our findings showed a high prevalence of asymptomatic prostatitis and a significant level of UTIs amongst men resident in Ekpoma who are 40 years and above. It also gives an insight into the prevalent etiologic bacterial agents associated with the UTIs. Routine screening for UTI and prostatitis for men who are 40 years and above is therefore recommended.

Key Words: Asymptomatic prostatitis, Bacteriuria, Infections, Urinary tract

INTRODUCTION

Prostatitis has been considered as the most common urologic complication for men under the age of fifty and the third most common for those over fifty (Collins *et al*., 1998). According to Moon (1997) and Roberts *et al*. (1998), population based percentage estimates of prostatitis in the general male population ranges from five to ten percent, while in one study by Collins *et al*. (2002) on health care professionals; self reported incidence of prostatitis was approximately 16%. In addition, it has been estimated that about 10% of men have chronic prostatitis like symptoms and approximately 60% of such men sought medical help (Liang *et al*., 2009; Nickel *et al*., 2001), while reported cases of prostatitis are similar in North America, Europe and Asia (Kreiger, 2004). The life-time probability of men acquiring prostatitis is greater than 25% (Menhik *et al*., 2000; Roberts *et al*., 1998) and prostatitis accounts for 25% of men visits for genitourinary complaints (Calhoun *et al*., 2004).

Available clinical data have shown that prostatitis is often associated with lower urinary tract symptoms (LUTS) like urinary burning, hesitancy, and frequency, as well as sexual discomfort/dysfunction including erectile dysfunction, painful ejaculation, postcoital pelvic discomfort and approximately half of the men with prostatitis suffers adverse sexual effects (Shoskes, 2004; Sadeghi-Nejad and Seftel, 2006). Even Toohey (1994) had earlier acknowledged that the prostate gland in men may be a focus of infection which might result to fever, dysuria, increased frequency of

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micturition and perineal pain, while McNaughton *et al*. (2001), Turner *et al*. (2005) and Calhoun *et al*. (2004) asserts that prostatitis can cause substantial physical and emotional distress including huge financial loss.

Of greater interest however, is the link between prostatitis and urinary tract infections (UTIs) as Johnson *et al*. (2005) states that most bacterial prostatitis probably follows a urinary tract infection (UTI) especially with uropathogens that demonstrate special virulence factors. Characteristically, UTIs are associated with significant bacteriuria resulting in a constellation of symptoms like dysuria, increased urinary urgency/frequency, suprapubic discomfort and costovertebral angle tenderness (Kass, 1956). Although urinary tract infections (UTIs) are uncommon in men because of the longer length of their urethra, antibacterial properties of the prostatic fluid, and less frequent periurethral bacterial colonization in men (Cunha, 2009), its incidence in populations have been acknowledged especially amongst uncircumcised men with poor hygiene; those infected with the Human Immunodeficiency Virus (HIV); and men who generally partake in unprotected sexual intercourse (Spach *et al*., 1992; Lipsky, 1996; Griebling, 2007; Cunha, 2009).

Indeed, the role of pathogens in the etiology of prostatitis have been recognized (Szoke et al., 1998; Krieger et al., 2005; Skerk *et al*., 2005; Naber, 2008; Naber *et al*., 2008; Nickel and Xiang, 2008; Wise and Shteynshlyuger,2008), but prostatitis is classified into *the acute bacterial type* (Krieger *et al*., 2005; Andreau *et al*., 1997; Roberts *et al*., 1997; Meares, 1992); *the chronic bacterial type* (Ulleryd *et al*., 1994; Andreau *et al*., 1997; Roberts *et al*., 1997); *the chronic prostatitis or chronic pelvic pain syndrome* (Brunner *et al*., 1983; Doble *et al*., 1993); and *the asymptomatic inflammatory prostatitis (AIP)* (Brunner *et al*., 1983; Doble *et al*., 1993). Considering the documented incidences of asymptomatic prostatitis, this study assesses the prevalence of asymptomatic prostatitis and urinary tract infection in apparently healthy men in Ekpoma, Edo State, Nigeria.

MATERIALS AND METHOD

Study Area: This study was carried out in Ekpoma –the administrative headquarters of Esan West Local Government Area of Edo State, Nigeria. It is fairly an urban area hosting the State owned Ambrose Alli University, Ekpoma, and located at 6.75^0N and longitude 6.13^0. The inhabitants are mainly farmers, traders, civil servants and students.

Sample Size: A total of 100 adult men between the ages of 40 – 79 were randomly recruited for this study. The men were however subdivided into four age–range subgroups.

Inclusion and Exclusion Criteria: Only adult men resident in Ekpoma and within the age-range of 40 – 49, 50 – 59, 60 – 69 and 70 – 79, were recruited for this study. Those who are not resident in Ekpoma and outside the stipulated age range, despite been residents of Ekpoma, were excluded.

Ethical Consideration: An informed consent was requested and granted by the men under study. The concept of the study as well as its benefits was adequately explained to them and having understood its dimensions, granted their informed consent.

Sample Collection: Urine samples were collected from subjects, guiding them on how to collect the urine. The subjects were given dry, sterile, and wide-mouthed/ leak proof screw-capped universal containers, and advised to use the mid-stream catch technique. The samples from the subjects were collected and allowed to stay for more than 30 minutes before analysis. In addition, 3mls of blood was collected from the subjects via the median cubital vein using sterile 5mls syringe and needle, and subsequently dispensed into sterile EDTA containers and then mixed appropriately.

Sample Analysis: The urine samples collected were macroscopically examined for colour and turbidity. For urine microscopy, about 10mls of the sample was pippetted into a test tube and centrifuged for 5 minutes. The supernatant was poured off, while the sediment is re-suspended by tapping the bottom of the tube. A drop of the well mixed sediment was then transferred into a clean grease free slide and covered with cover slip. The preparation was examined microscopically under x40 objective. Urine culture, identification of colonies, Gram Staining, biochemical

characterization such as catalase test, coagulase test, and sugar fermentation techniques as well as Antibiotic Susceptibility Testing and Prostate Specific Antigen determination were performed using standard procedures.

Statistical Analysis: All data collected from this study were analyzed using the descriptive statistic method (mean and percentages), as well as the chi-square (X^2) and contingency table methods.

RESULTS

Of all the 100 urine samples examined, 43 (43%) had significant bacteriuria and of these, 10 (40%) were found in samples collected from men within the age range of 40 – 49; 8 (32%) from age range 50 -59; 22 (88%) from age range 60 – 69; and 3 (12%) from age range 70 – 79 (*Figure 1*). The differences between values obtained from age ranges 40 – 49 and 50 – 59, were not statistically significant ($p>0.05$). However, the differences between values obtained from age ranges 40 – 49 and 60 -69; 40 – 49 and 70 – 79; and 50 – 59 and 70 – 79, were statistically significant ($p<0.05$) unlike the differences between the values obtained from age ranges 50 – 59 and 70 – 79; and 60 - 69 and 70 – 79 that were not statistically significant ($p>0.05$).

Also, of all the 100 blood samples examined, 35 (35%) were found to be positive for prostatitis. Of these, 5 (20%) were found in age range 40 – 49; 7 (28%) in 50 – 59; 19 (76%) from age range 60 – 69; and 4 (16%) from age range 70 -79 (*Figure 2*). The differences in the infection rates between age range 40 – 49 and 50 – 59, were not statistically significant ($p>0.05$), while the differences between the values from age range 40 – 49 and 50 – 59; 50 – 59 and 60 – 69; and 60 – 69 and 70 -79, were statistically significant ($p<0.05$). However, the differences between the values from age range 40 – 49 and 70 -79; and 50 – 59 and 70 – 79 were not statistically significant ($p>0.05$).

The frequency of isolation of organisms from the urine samples that yielded significant bacteriuria as shown in figure 3. It was observed that *S.aureus* has the highest incidence rate 25 (58%) followed by *S. saprophyticus* with incidence rate of 16 (37%). *E. coli* had the lowest incidence rate of 2 (5%).

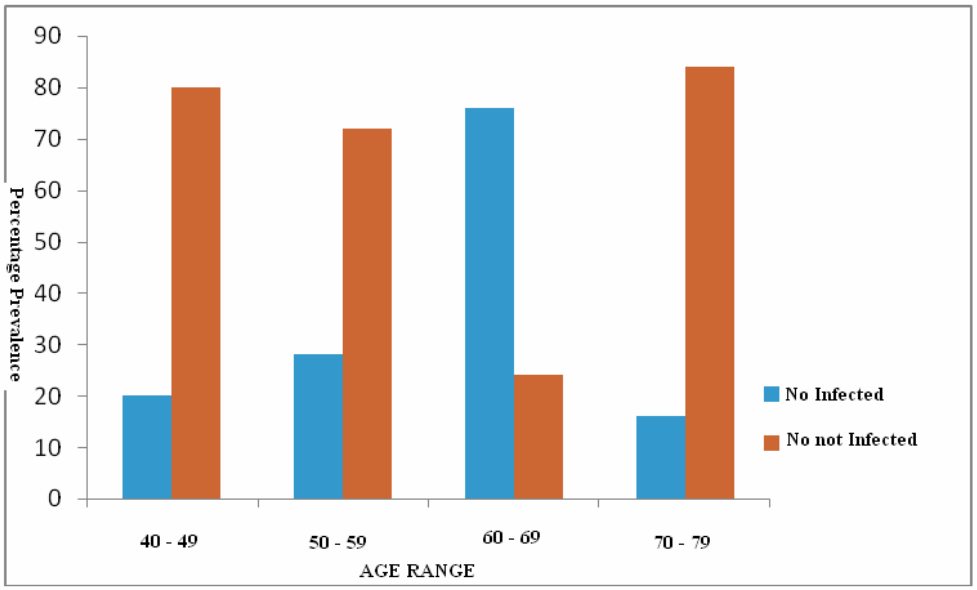

Figure 1: A bar chart showing percentage prevalence of Urinary Tract Infections (UTIs) among men of different age range

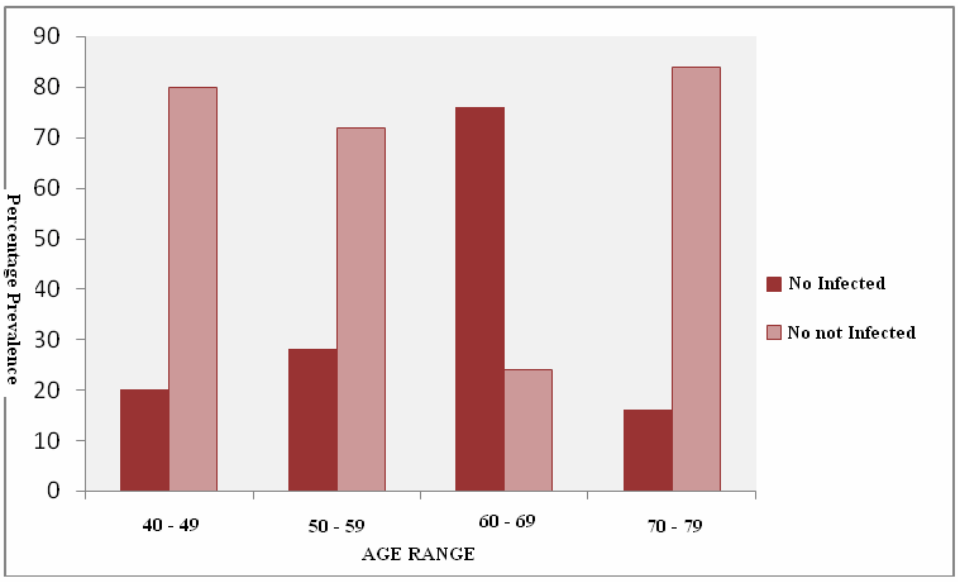

Figure 2: A bar chart showing percentage prevalence of Prostatitis among men of different age range

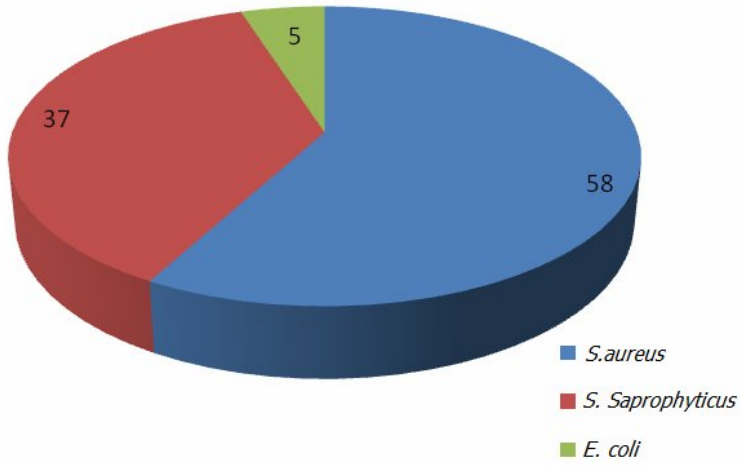

Figure 3: A bar chart showing prevalence of isolates from the urine samples

DISCUSSION

The prevalence rate of obtained in this study was higher than the one in the study by Stamy and Pfau (1970) possibly due to the absence of a good marker like PSA for proper diagnosis before this time. The use of PSA as a better marker in the diagnosis and management of adenocarcinoma of the prostate has been reported (Stamy *et al*., 1987). Prostatic fluid has bactericidal activities which help prevent infections, but unfortunately, the protective prostatic fluid is not secreted in cases of prostate hypertrophy or prostatitis, and this makes the prostate gland vulnerable to

infection by microorganisms. Also, the incidence of bacterial organisms –*Staphylococcus aureus*, *Staphylococcus albus* and *E*scherichia *coli* with *S. aureus* being the most prevalent uropathogen in the subjects under study, is one finding that required explanation. There is a possibility that the isolated *E-coli* might be from the subject's own gut while the ubiquitous nature of *S.aureus* may account for its prevalence (Brook *et al*., 1998).

Generally, the cause of UTIs amongst the elderly is multifactorial, but incomplete emptying of the bladder is believed to be the primary source (Baldassarre and Kaye, 1991; Brook *et al*., 1998; Reid and Nicolle, 1999; Ribeiro *et al*., 2002; Nicolle, 2003) especially in pathologic condition like prostatitis. Of course, bacteria gain access to the urinary tract by ascending from the perineum and are typically eliminated via the urine. From the results, the PSA concentration within the range of 60 – 69 was the highest, this increase is related to the prostate volume. Most PSA is made in the transition zone (TZ) of the prostate and this region of the prostate increases in volume in men with benign prostate hyperplasia (BPH). Studies have also shown an increase in PSA level in men signs and symptoms of urinary tract infections. Toohey (1994) had reported that prostate tends to enlarge with advance in age and causing fever, dysuria, increased frequency and perineal pain while severe benign prostatic hypertrophy has been implicated as a risk for recurrent UTI (Manisha, 2007; 2009), therefore this group of subjects should always be screened for prostatitis and bacteriuria.

Furthermore, the observation that subjects within the age range of 60-69 had the highest prevalence of UTI and an increased PSA level as against those within the age range of 70 – 79, with the least PSA concentration and UTIs, confirms the findings by Dalton (1989) of concerning elevation of PSA concentration in acute bacteria prostatitis. This might be due to the non secretion of prostatic fluid in this group as confirmed by the elevation of the PSA, thus making the prostate prone to infection by micro-organisms. Studies have shown that UTIs are the second most common cause of infectious disease hospitalization in adults of 65 years and above after lower respiratory tract infections (Curns *et al*., 2005).

Above all, the findings of this study suggests that there is the prevalence of asymptomatic prostatitis and a significant level of UTIs amongst men resident in Ekpoma who are 40 years and above, and gives an insight into the prevalent etiologic bacteria agents associated with UTIs. We therefore recommend routine screening for UTI and prostatitis amongst men who are 40 years should be.

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AUTHOR'S CONTRIBUTIONS

Turay and Obadan conceptualized the research. The analysis was done by Obadan under the supervision of Turay. Okogun, Okodua and Okwori joined in writing and reviewing this paper. All authors funded it. No conflict of interest declared.