A Population based Study of Prostate Cancer in Rivers State, Nigeria

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ABSTRACT

Background: Cancer of the prostate (CaP) is the commonest male cancer in Nigeria. Previous CaP studies from Rivers state of Nigeria are limited in scope to individual case series or single institutional practice.

Aim: To present the first population based cancer registry study findings on CaP in Rivers state.

Methodology: Data from CaP patients in Port Harcourt and Obio-Akpor council areas, stored in Port Harcourt cancer registry’s CanReg 4 software between 2008 and 2017 were retrieved and analysed. Information on the dates of incidence, patients place of domicile in the previous 12 months and above, age, morphology and degree of differentiation were analyzed.

Result: CaP constituted 676 (25.2%) of all cancers and 56.8% of male cancers. The range, mean and peak age groups were 38-92 years, 67.1 ± 11.1 years and 70-74 years respectively. The overall age standardized incidence rate (ASR) per 100,000 of the population ranged between 13.9 in 2014 and 63.7 in 2017, with an undulating but overall increasing trend. For the peak age group (70-74 years), ASR was 89.6/100,000. Adenocarcinoma constituted 99%. While 47.3% were working class, 87% attained secondary or tertiary and 68.9% were urban dwellers.

Conclusion: CaP incidence remains high in Port Harcourt and Obio-Akpor. Current mean age at presentation is lower than those of previous decades. Overall, incidence trend is upwards. Urgent public health measures that will stem the tide of the menacing threat of CaP to Nigerian men is imperative. (Int J Biomed Sci 2019; 15 (2): 57-62)

Keywords: Cancer registry; Prostate; Port Harcourt; Obio-Akpor; age-standardized; incidence; rate

INTRODUCTION

Globally, prostate cancer is the fourth most common cancer in both males and females combined and the second most common cancer in men, accounting for 15% of male cancers in 2012 (1). In the 90s, CaP incidence was traditionally considered to be low in Sub-Saharan Africa (2), contrary to the recent works in Nigeria which showed that CaP is not only steadily rising in incidence, but has become the most common cancer as well as the most com-
mon cause of cancer death in men above 50 years (3-6). Population growth and increased life expectancy has been noted as being responsible for the increased incidence of cancers generally including CaP (7). Ethnic and geographic variation in incidence of CaP is well documented in the literature and is attributed to environmental and genetic factors as well as prostate specific antigen (PSA) screening biases (8, 9). Reduced incidence age and differences in other demographic features of the diseases have also been observed in a recent study in the Niger Delta Region of Nigeria (10).

While many studies have looked into the different aspects of prostate cancer in our environment, these studies have been largely limited by scope as they were restricted to individual case series or single institutional practice and experience (3, 11-14). This study which is population-based, presents robust and holistic information on CaP.

**MATERIALS AND METHOD**

Port Harcourt cancer registry (PHCR) is a unit in the University of Port Harcourt Teaching Hospital (UPTH). Data of the registry is exclusively for residents of Port Harcourt city and Obio-Akpor local government areas. The population of the areas in 2006 census was 1,000,908 (19.3% of Rivers state population). The two local government areas are the most populous in the state, cover rural and urban settlements, are upland by topography and together constitute the capital of Rivers state. Thus, they host the seat of government and maintain the nucleus of specialized medical care in the state including federal and state tertiary health institutions and other specialist hospitals. Population projection for the years of study (2008-2017) was made from the 2006 census figures by officials of the National Population Commission. Generally in PHCR, cancer cases are defined by histology, cytology and hematology smear reports as well as patients physical examination findings, clinical impressions and autopsy reports/death certificate reviews. Staff of the registry actively and passively collects information on cancer patients from notification centres which include: out-patients’ departments and wards of the tertiary, general, and private hospitals that are involved in the diagnosis and treatment of cancer as well as privately owned and operated radiologic and pathology diagnostic centre operating within the stipulated local government areas. Identified cases are classified and coded, using the International Classification of Disease for Oncology, 3rd Edition (ICD-O3) (15). The information is electronically stored in Canreg 4 software. As much as possible, completeness of case registration devoid of duplication is ensured, through regular visits to the notification sources and performance of duplication checks. Information on the dates of incidence, patients place of domicile for at least the previous 12 months, educational attainment, age, topography, morphology of the lesion and the degree of differentiation were retrieved and exported to SPSS version 23 for analysis. The annual age-standardized rates (ASR) per 100,000 were calculated using WHO world standard population. The results were presented in simple descriptive formats. Pearson’s Chi square test was used to test significance of differences between two proportions. P<0.05 was taken to be statistically significant.

Ethical clearance was obtained from the ethics committee of the University of Port Harcourt Teaching Hospital.

**RESULT**

According to Nigeria’s 2006 census, the population structure of Rivers state generally is bottom-heavy with predominance of children and adolescents over adults and the elderly. Specifically among the males, young adults under 20 years constituted the peak beyond which there is steady decline with age. Overall, those aged below 45 years constituted 84% while those aged 45 years and above constituted only 16 percent. For Port Harcourt city and Obio-Akpor local government areas, the total population was 1,000,908 (519,654 males and 481,254 females). Since the denominator population for this study (spanning 2008-2017) was projected from the 2006 census figure, the age distribution pattern maintained the above relativities.

For the ten years, a total of 2682 cancers were recorded in Port Harcourt cancer registry with males constituting 1191 (44.4%). Of this, CaP constituted 676 (25.2%) of male and female cancers combined and (56.8%) of only male cancers. The overall mean age was 67.1 ± 11.1 years and ranged between 64.7 years and 69.2 years (Figure 1). The youngest patient was 38 years while the oldest was 92 years. The incidence increased with age till the peak age group of 70-74 years n = 140 (20.7%), closely followed by 65-69, n = 116 (17.2%) (Figure 2). Only 18 (2.7%) and 148 (21.9%) of the patients were below 45 and 60 years respectively. Majority, n = 447 (66.1%) were aged between 60-79 years. Only 73 patients (10.8%) were 80 years and above. The overall age standardized incidence rate (ASR) per 100,000 of the population ranged between 13.9 and 63 for 2014 and 2017 respectively, with a mean of 36.2. The ASR/100,000 ranged between 0.3 and 89.6 for 35-39
and 70-74 years age groups respectively. (Table 1) Morphologically, adenocarcinoma constituted almost all cases n=669 (99%), while squamous cell carcinoma constituted 4 cases (0.6%). There were two cases (0.3%) of metastatic carcinoma to the prostate, although the sites of primary tumor were not indicated and a case of rhabdomyosarcoma (0.1%) (Table 2). While 297 cases (43.9%) were poorly differentiated, 282 cases (41.7%) were well differentiated and 97 cases (14.3%) were moderately differentiated.

Trend analysis showed undulation but overall, it is upwards (Figure 3). Mean annual incidence was 67.7. There was significant reduction in the recorded cases in 2014 with only 29 cases, well below the annual average of 67.7 unlike in 2017 when there was significant leap in the number with 144 cases.

**DISCUSSION**

Cancer constitutes a major national health burden in Nigeria and data on its incidence is necessary for proper planning of the control programmes. This is best articulated through cancer registration exercise, which also provides reliable source of information on cancer profiling. However, cancer registration has been unpopular in most parts of Nigeria prior to last decade. Consequently most Nigerian publications on cancer incidence and prevalence have been based on restricted, individualized practices and case series. The data dawn from the on-going multi-centre cancer registration exercise in Port Harcourt cancer registry obviates this limitation, and brings to the fore holistic and encompassing data on prostate cancer incidence in...
the two most populated local government areas of Rivers state, (South South geopolitical region of Nigeria - Obio Akpor and Port Harcourt city.

In this study, CaP constituting 676 (25.2%) of all cancers and (56.8%) of male cancers is indicative of high burden of prostate cancer in our environment. Although CaP has been reported by many as the most common cancer among males, none reported proportion of up to 56% male cancer composition. For example, earlier reviews of the Ibadan cancer registry (South West Nigeria) and Zaria cancer registry (North West Nigeria) showed that although CaP was the commonest male cancer, it constituted only 11% and 10.1% respectively (5, 18). Furthermore, a more recent review of the Ibadan and Abuja cancer registry data by Jedy-Agba et al reaffirmed CaP as the most frequent male cancer (constituting 21.7% and 28% respectively) (14). Also Parkin et al in their review of the global burden of cancer in 2000, estimated that CaP generally constituted 10% of male cancers (19). Our present study and the previous clinico pathologic hospital based ones on CaP in UPTH show high incidence rate (12, 13). Ekeke et al earlier attributed this high incidence rate to the public enlightenment campaigns on Radio and Television in Port Harcourt, and to a limited extent, PSA screening. This justifies the International Agency for Research on Cancer (IARC)s statement that CaP is a growing concern in Africa and their projection that in 2030, there would be a 104% increase in CaP deaths across Africa (20).

Studies indicate that carcinogenesis and progression of CaP is affected by sex hormones, environmental influences and genetics (21, 22). Deciphering which of these factors (or if all) are responsible for the high burden in our environment remains a challenge, especially as some areas around our environment, from where some of our rural patients visit and are diagnosed of CaP have been internationally acclaimed as heavily polluted and degraded by decades of poorly regulated activities of oil companies operating in the oil-rich Niger Delta region of which Rivers state is the epicentre (10, 24).

The age range of 38-92 years in this study is wider than the 42-90 years which were recorded at different times in the previous UPTH hospital-based studies (3, 9, 10, 12, 13). This disparity is likely due to the wider scope of data coverage in this study since it is multicentred and population based; thus more realistically representing the current profile of CaP in our environment. While the annual mean ages for the years under review ranged between 64.7 and 69.2, the overall mean was 67.1 years. Previous studies from our centre showed mean ages in the range of 69.9 -71.6 years - reflecting a drop in the mean age. Similarly, an earlier study on age and the pathology of prostate cancer in Port Harcourt observed a decreasing mean age at presentation (14). Furthermore, more patients - 26 (3.8%) were below 50 years compared to the 1 - 2% reported in previous studies in UPTH (3, 12). The decreasing age at presentation could be a reflection of the environmental and genetic influences that result in changes in disease epidemiology and pattern, including: early diagnosis with PSA testing (10), decreasing life expectancy of our population or the availability of more Urologists/pathologists in Port Harcourt.

The reportage of cases in their 30s is similar to Oluwole and Badmus (18, 25), findings in Zaria and Ile-Ife respectively. Early-age cancers are commonly hereditary.
Thus it is possible that those cases are hereditary but more epidemiologic and genetic studies need to be carried out in our environment to ascertain the place of hereditary CaP susceptibility gene locus - 1q24-25 among our patients (21). Besides, Early-age CaP is said to have worse prognosis than late-age ones (26). Therefore intensive follow up on young CaP patients’ needs to be carried out in our environment.

The overall age standardized incidence rate (ASR) per 100,000 of the population ranged between 13.9 and 63 for 2014 and 2017 respectively, while the mean for the study period was 36.2. The trend of the annual ASR obviously reflects the inconsistent and undulating annual overall rates. However, while some of the annual ASR are comparable with the 17.4 and 25.8 annual rate reported by Elima et al for Ibadan (IBCR) (South West) and Abuja (ABCR) North West registries respectively, the rates for the other years were well above the IBCR and ABCR rates. Also, the mean of the annual ASR of 36.2/100,000 is above the rates of the of the ABCR and IBCR while both the range and mean of our ASR is below the 89 reported for Calabar cancer registry (CACR) which is incidentally within the same South South geopolitical region of Nigeria (4, 16). This feature reflects the geographic variation in incidence rate of CaP which is well documented in the literature. 40 The ASR/100,000 which ranged between 0.3 and 89.6 for 35-39 and 70-74 years age groups respectively clearly supports the fact that CaP is a disease which majorly affects the elderly and is consistent with previous studies that showed positive correlation between CaP and age (27). Although studies have shown that people living in countries with high life expectancy are more likely to have cancer including CaP, the high ASR in the elderly age group in our study is not because of high life expectancy but the relatively high number of cases compared to age-matched population size (28, 29).

Adenocarcinoma constituted 99% of the morphologic forms. A study spanning the preceding decade to ours conducted in UPTH and Zariah showed 100% adenocarcinomas (3, 18). However, our study recorded other morphologic forms like squamous cell carcinoma - (0.6%), metastatic carcinoma - (0.3%) and rhabdomyosarcoma - (0.1%), suggesting a changing morphologic pattern. Comparable with our finding is Ifewere et al (30) who while reviewing the trends of CaP across registries in Nigeria also reported that adenocarcinomas constituted 98% with adenosquamous and squamous cell carcinoma constituting the rest. Diagnosing these uncommon morphologic types is important because of their none-response to androgen depriva-

CONCLUSION

CaP incidence remains high in Port Harcourt and Obio-Akpor, with younger mean age at presentation compared to the previous decades. Overall, the trend of incidence is upwards. Although poorly differentiated adenocarcinoma remains the dominant morphologic type, rare non-adenocarcinoma types are evolving; giving cause for additional concern since these forms do not respond to hormone treatment which is the mainstay of patient treatment in our environment. Urgent public health measures need to be put in place to stem the tide of this menacing threat to the existence and comfort of Nigerian men.

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REFERENCES


