# Risk factors and indicators for prostate cancer

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## ABSTRACT

The second most common cancer diagnosis for males is prostate cancer, which more frequently affects elderly people. In environments with limited resources, this disease is frequently not discovered until it has progressed to an advanced stage, leaving patients with a terrible prognosis. This study sought to discover variables associated with aggressive prostate cancer and a poor prognosis in prostate cancer patients at a single facility in Douala, Cameroon. We conducted a retrospective analysis at the Centre medico-chirurgical d'urologie in Douala, Cameroon, between 2015 and 2020. We included 203 patients, aged 41 to 85, who had prostate cancer identified by histopathology following either a prostate biopsy or a laparoscopic prostatectomy. To determine parameters linked to prostate cancer aggressiveness and patient outcomes, data were analysed using Epi-info 7 and logistic regression analyses were carried out (survival or mortality). The average age of the participants in our study was 64.76 years+7.48 years. A significant family history of prostate cancer affected ten of the individuals. In 61.58% of the patients, symptoms of the lower urinary tract were evident. 100 individuals were anemic, 36 patients had aggressive manifestations of the disease, and all patients had blood Prostate-Specific Antigen (PSA) values greater than 4 ng/ml. Digital Rectal Examination (DRE) results for 88 subjects were astonishing. Trans Rectal Ultrasonography (TRUS)

measurements showed that the median prostate volume individuals passed away while being followed up on, and 59 patients had abnormal prostate echo structures. Aggressive prostate cancer was highly correlated with paraplegia, as well as occupations requiring unskilled work. Prostate cancer aggressiveness and patient outcomes were substantially correlated with the presence of lymphedema, aberrant DRE findings, anemia, enlarged prostate glands (prostate volume>50 ml), and abnormal prostatic echo structures. A significant public health issue in Cameroon is the late detection of prostate cancer due to the complications and dismal outlook of the disease at an advanced stage. The identification of these characteristics may help doctors make better therapeutic decisions for their patients. Prostate cancer aggression and a poor prognosis are related to specific clinical, biochemical, and imaging markers.

**Key Words:** *Hepatobiliary; Surgical care; Oncology, Brest cancer, Vascular surgery*

## INTRODUCTION

The sixth largest cause of cancer-related death in males is prostate cancer, which is the second most frequently diagnosed cancer in men. Prostate cancer accounts for more than 1,100,000 new cases per year and more than 300,000 fatalities worldwide. With a median age upon diagnosis of over 60 years old, the condition is more prevalent in older males. Prostate-specific Antigen (PSA) levels that are

abnormal are typically used to diagnose the condition, which is then followed by a Transrectal ultrasound-guided biopsy, a digital rectal exam, or both. This is because the disease is frequently asymptomatic in its early stages. Nearly all malignancies are diagnosed and monitored by CT, but because of its poor soft-tissue contrast resolution, which prevents exact differentiation of the internal and exterior architecture of the prostate, it has a limited role in the

imaging of prostate cancer. However, CT only identifies the expansion of affected nodes, which is a late discovery in patients with prostate cancer. Bony involvement and nodal staging are the main uses of CT in patients with prostate cancer. However, because of the continent's extreme poverty, illnesses that do not immediately endanger people's well-being are frequently disregarded and underdiagnosed, suggesting that prostate cancer is frequently detected after it has spread. it was found that only 81 instances of a possible 625 instances of prostate cancer were detected early, and 66% of the Zulu population of KwaZulu-Natal had either radiological evidence of metastases or blood PSA levels of more than 100 ng/ml. In sub-Saharan Africa, the prevalence of prostate cancer is steadily rising. According to Ogunbiyi, prostate cancer is the most prevalent type of cancer among males in Nigeria, affecting up to 11% of them. Increases in the rates of disease-related morbidity and mortality follow this gradual rise in the prevalence of the condition. According to the 2013 Institute for Health Metrics and Evaluation (IHME) study, the number of Disability-Adjusted Life Years (DALYs) and fatalities from prostate cancer increased between 1990 and 2013, with an estimated 61% and 83% rise in DALYs and deaths from prostate cancer, respectively. IHME calculated that the number of deaths from prostate cancer grew from 5600 to 12,300 during the same period in Sub-Saharan Africa (SSA), while the number of DALYs increased from 100,200 in 1990 to 219,700 in 2010. Given the severe disease burden and high mortality risk, it's critical to recognise the signs of aggressive prostate cancer and a bad prognosis (typically the patient's death). Age, African-American race, and positive family history were all recognized by Gann as risk factors for prostate cancer. The only firmly proven, non-modifiable risk factors for the illness, according to Liesmann and Rohr Mann, are age, race, and positive family history. Additionally, they noted that smoking and obesity are positively connected with death from prostate cancer and that regular consumption of meat and dairy products also promotes the development of the disease [1]. However, there are few studies on the risk factors and variables that affect the disease's prognosis in sub-Saharan Africa.

A retrospective analysis was conducted at the Centre medico-chirurgical d'urologie in Douala, Cameroon, between 2015 and 2020. Transurethral Prostate Resection (TURP) or prostate biopsy was used to diagnose 203 patients with prostate cancer using histology. All patients with incomplete clinical records were eliminated. In our investigation, abnormal results on a digital rectal examination and/or a blood PSA level greater than 4 ng/ml served as grounds for a prostate biopsy (DRE). The age, profession, Body Mass Index (BMI), method of a positive diagnosis, family history of prostate cancer, clinical presentation (including findings from digital rectal examination), complications of the disease (including hip fractures, lymphedema, and paraplegia), serum Prostate-Specific Antigen (PSA) level, and Trans Rectal Ultrasound (TRUS) findings (including hip fractures, lymphedema, and paraplegia) were all collected from the clinical records of the study participants. All of the patients were checked monthly after the initial diagnosis and treatment. Patients were checked during the monthly follow-up visits, and some parameters were measured for follow-up, including the patient's height, blood pressure, pulse, BMI, and hemoglobin level. Patients' serum PSA levels were also assessed every three months. The PSA levels were typically anticipated to drop; however, if they remained unchanged or even rose, the patients in question received a second treatment, and even a third if the PSA levels did not drop. We divided the participants' occupations into four major categories to aid data analyses [2]. Those in the first group included professionals with

advanced degrees, including engineers, physicians, teachers, lawyers, judges, and technicians. The second category included unskilled labourers including bricklayers, drivers, and traders. Retired individuals made up the third category, and law enforcement personnel, primarily police officers and soldiers, made up the fourth. If the examiner detected indurations and/or nodules on the prostate gland during palpation, the DRE findings were deemed notable [3]. As it has been proven that prostate cancer is present in the peripheries of the gland in up to 70% of cases, an aberrant echostructure was defined in our study as the presence of hyperechoic, hypoechoic, or mixed ultrasonic patterns in certain parts of the prostate gland. A BMI of less than 18.5 kg/m$^2$ was categorized as underweight, 18.5 kg/m$^2$ to 24.9 kg/m$^2$ as normal weight, 25 kg/m$^2$ to 29.9 kg/m$^2$ as overweight, and 30 kg/m$^2$ as obesity (30 kg/m$^2$ to 34.9 kg/m$^2$ was categorized as class I obesity, 35 kg/m$^2$ to 39.9 kg/m$^2$ was categorized as class II obesity, and 40 kg/m$^2$ was categorized as morbid obesity). Participants were deemed anemic if their hemoglobin levels were under 13 g/dl, which is the criterion of anemia used by the WHO. The prostate gland volume of each subject was measured using TRUS, keeping in mind that the average volume for males in this age range is 38 ml. The Gleason and International Society of Urological Pathology (ISUP) grading systems were used to categorize the tumors.

Since some study participants did not undergo surgery, it was not possible to determine the tumor aggressiveness in all of the study subjects. Therefore, the existence of metastases, serum PSA>50 ng/ml, and a Gleason score of 8 were the criteria for aggressively in this investigation, and patients who met these three criteria were thought to have aggressive prostate cancer. With the patients in the lateral decubitus posture and under local anesthesia (with 2% Xylocaine), the biopsy was carried out using a biopsy pistol. These biopsy samples were immediately delivered to the lab for histological examinations after being packed in the formal inside of little containers.

To conduct the analysis, all study data were entered into Microsoft Excel 2007 and exported to Epi Info 7. When presenting continuous data, the median and interquartile range were used for variables with skewed data distributions, and the mean value and standard deviation for variables with normally distributed data. Frequencies and percentages were used to present categorical data. The chi-square test was used to compare proportions between categorical variables, while the Mann-Whitney U test and Student's t-test were employed to analyze continuous data for skewed and regularly distributed variables, respectively [4]. To ascertain the five-year overall survival of our research participants, Kaplan-Meier survival analyses were conducted. Statistical significance was defined as a P-value of 0.05. The institutional review board of the University of Douala's Faculty of Medicine and Pharmaceutical Sciences and the ethical committee of the Centre medico-chirurgicale d'urologie, both in Douala, Cameroon, gave their approval to this study. The retrospective study design allowed for the waiver of the informed consent requirement [5].

We included 203 patients, ranging in age from 41 to 85, whose prostate cancer had been identified by histopathology following either a prostate biopsy or a laparoscopic prostatectomy. Our study's participants were 64.76 years+7.48 years old on average. The age group that made up the majority of research participants—61 years–70 years—accounted for 49.26% of all participants, while the age groups with the lowest representation—40 years–50 years and>80 years—accounted for 1.97% of all participants. 95.07% of the individuals in our study did not report having any relatives who had been diagnosed with prostate cancer [6]. Moreover half of the patients in our study (26.11% and 26.60%, respectively) received a diagnosis in 2017 or 2018. 75.66% of the individuals in our study underwent a prostate biopsy, and 24.14% underwent TURP, to get the samples for histopathology. The individuals in our study had follow-up periods

that lasted anywhere from 132 days and 2385 days on average, with a median value.

Given that both studies were conducted in sub-Saharan African nations, the parallelism in the mean age can be explained. Additionally, in both instances, the samples were typical of the overall population of prostate cancer patients [7]. 4.93 of the participants in our study admitted to having a history of prostate cancer in their families. This is less than the 15% that was stated. This discrepancy can be explained by the fact that Steinberg et al. conducted their research in the United States, where there is a significantly higher level of public knowledge of the condition and where it is frequently diagnosed much sooner than it is in Cameroon. Since the age of onset of the condition frequently coincides with the life expectancy for men in this part of the world, many cases of prostate cancer currently go undiagnosed in our resource-constrained environment, and deaths from prostate cancer are frequently attributed to natural causes or witchcraft. The percentage of people who report a positive family history will surely rise as the rate of diagnoses for this ailment in Cameroon rises. We discovered that LUTS (61.58%) was the disease's most prevalent clinical manifestation.

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