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Epidemiological profile of patients with prostatic neoplasia in a high complexity oncology center

Perfil epidemiológico de pacientes com neoplasia prostática em um centro de alta complexidade em oncologia

Perfil epidemiológico de pacientes con neoplasia de próstata en un centro de oncología de alta complejidad

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Abstract

Objective: To describe the profile of prostate cancer patients who sought hospital care at a Brazilian High Complexity Oncology Center, as well as their condition on arrival at the center. **Methods:** This is a descriptive observational study, based on secondary data from the tumor file in the Hospital Cancer Registry at Afecc-Hospital Santa Rita de Cássia. RStudio and R software were used for descriptive analysis. **Results:** A total of 5,403 new analytical and non-analytical cases of prostate neoplasms were analyzed between 2000 and 2016. The number of cases had a mean age of 69.40 years (SD=8.82), with an increasing trend over the period (p<0.001). The majority of patients were over 60 years old (86.82%), brown or white (91.97%), with incomplete primary education (52.88%), married (67.37%), referred by SUS (76.12%), with no other primary tumors (97.87%), and histological type classified as adenocarcinoma (96.22%). The variables age (p=0.017), race/skin color (p<0.001) and education (p<0.001) showed statistically significant differences between analytical and non-analytical cases. **Conclusion:** The analyses show an upward trend in the incidence of prostate cancer over the years, and prostate neoplasia has a tropism for older, married men with a low education level.

***Descriptors*:** Medical Oncology; Prostatic Neoplasms; Epidemiology; Men's Health; Hospital Records.

Whats is already known on this?
Although some risk factors for prostate neoplasia are well established, including older age, ethnicity, genetic factors, family history and hormonal factors, other associated factors need to be better investigated.

What this study adds?
There is a growing trend in the incidence of prostate cancer with a tropism for older, married men with a low education level.

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Resumo

Objetivo: *Descrever o perfil dos pacientes com câncer de próstata que procuraram atendimento hospitalar em um Centro de Alta Complexidade em Oncologia brasileiro, bem como sua condição de chegada no referido centro.* ***Métodos:*** *Estudo observacional descritivo, a partir de dados secundários, via ficha do tumor do Registro Hospitalar de Câncer do Afecc-Hospital Santa Rita de Cássia. Para análise descritiva, utilizou-se os softwares RStudio e R.* ***Resultados:*** *5403 casos novos analíticos e não-analíticos de neoplasias prostáticas foram analisados entre 2000 e 2016. O número de casos apresentou idade média de 69,40 anos (DP=8,82), com tendência crescente no período (p<0,001). A maioria dos pacientes apresentava idade maior que 60 anos (86,82%), eram pardos ou brancos (91,97%), com ensino fundamental incompleto (52,88%), casados (67,37%), encaminhados pelo SUS (76,12%), sem ocorrência outros tumores primários (97,87%), e tipo histológico classificado como adenocarcinoma (96,22%). As variáveis idade (p=0,017), raça/cor da pele (p < 0,001) e escolaridade (p < 0,001) apresentaram diferença estatisticamente significante entre os casos analíticos e não-analíticos.* ***Conclusão:*** *As análises evidenciam tendência de crescimento na incidência de câncer de próstata com o passar dos anos, e a neoplasia prostática apresentou tropismo para homens idosos, casados, com baixa nível educacional.*

Descritores: *Oncologia; Neoplasias da próstata; Epidemiologia; Saúde do homem; Registros Hospitalares.*

Resumén

Objetivo: *Describir el perfil de los pacientes con cáncer de próstata que buscaron atención hospitalaria en un Centro Oncológico de Alta Complejidad brasileño, así como su condición al llegar a ese centro.* ***Métodos:*** *Estudio observacional descriptivo, basado en datos secundarios, a través del expediente de tumores del Registro Hospitalario de Cáncer de Afecc-Hospital Santa Rita de Cássia. Para el análisis descriptivo se utilizó el software RStudio y R.* ***Resultados:*** *Se analizaron 5403 nuevos casos analíticos y no analíticos de neoplasias de próstata entre 2000 y 2016. Los casos registraron una edad promedio de 69,40 años (DE=8,82), con una tendencia creciente en el período (p<0,001). La mayoría de los pacientes tenían más de 60 años (86,82%), eran mestizos o blancos (91,97%), con educación primaria incompleta (52,88%), casados (67,37%), remitidos por el SUS (76,12%), sin aparición de otros tumores primarios (97,87%) y tipo histológico clasificado como adenocarcinoma (96,22%). Las variables edad (p=0,017), raza/color de piel (p < 0,001) y educación (p < 0,001) mostraron diferencia estadísticamente significativa entre los casos analíticos y no analíticos.* ***Conclusión:*** *Los análisis muestran una tendencia creciente en la incidencia del cáncer de próstata a lo largo de los años, y la neoplasia de próstata mostró un tropismo por hombres ancianos, casados y con bajo nivel educativo.*

Descriptores*: Oncología Médica; Neoplasias de la Próstata; Epidemiología; Salud del Hombre. Registros de Hospitales.*

INTRODUCTION

Worldwide, non-communicable diseases (NCDs) are the main causes of illness and death in the population.[1] NCDs are responsible for 41 million deaths each year, equivalent to 71% of all deaths worldwide. Cardiovascular diseases account for the majority of deaths from NCDs, i.e. 17.9 million people annually, followed by malignant neoplasms (9.3 million). Malignant neoplasms are becoming a global public health problem as they cause a high psychosocial and economic burden on individuals, families and health systems.[2,3]

For Brazil, the latest estimate from the José Alencar Gomes da Silva National Cancer Institute (Instituto Nacional de Câncer José Alencar Gomes da Silva, INCA) points to 704,080 new cases of cancer for each year of the three-year period 2023-2025. According to the projections, the most frequent types of cancer in men, with the exception of non-melanoma skin cancer, will be prostate (30%), colon and rectum (9.2%), trachea, bronchus and lung (7.5%), stomach (5.6%) and oral cavity (4.6%). It is estimated that there will be 71,730 new cases of prostate cancer in Brazil over the next few years. For the state of Espírito Santo, prostate cancer is the most common, with 84.36 new cases for every 100,000 men, which means around 1,740 new cases for each year of the three-year period 2023-2025.[4]

It is known that some of the risk factors are well established and include: older age, ethnicity, genetic factors, family history and hormonal factors.[1,5-7] Although the prostate cancer etiology is a subject that has been studied worldwide, some associated factors still remain unclear when compared to other common cancers.[2]

With an estimate of almost 1.4 million new cases (7.3% of all cancers diagnosed) and 375,000 deaths, prostate cancer ranks as the second most common cancer (behind lung cancer) and the fifth leading cause of death among men in 2020 worldwide, with an increasing trend in incidence globally.[8] It has an incidence rate three times higher in developed countries than in developing countries, is the most commonly diagnosed cancer in 112 countries and is the leading cause of cancer death among men in 48 countries.[6] However, population studies show an uneven geographical distribution of its incidence and aggressiveness, indicating the influence of hereditary characteristics and lifestyle habits on the risk of its development, which reflects the relevance of exploring the profile of cohorts considering specific contexts and populations to support assertive cancer surveillance actions.

Specifically, for the Espírito Santo state, and in line with the national panorama, prostate cancer is the most incident, accounting for 84.36 new cases per 100,000 men, which means around 1,740 new cases for each year of the 2023-2025 triennium, according to INCA. A previous cross-sectional study carried out in the Espírito Santo state, which aimed to assess the association of sociodemographic and clinical factors with initial staging in men with prostate cancer treated between 2000 and 2006 in a single hospital, found that the variables race/non-white color, Gleason score ≥ 7 and prostate-specific antigen (PSA) >20 ng/dL were associated with late staging at diagnosis, while referral to the oncology service, without diagnosis and without previous treatment or with diagnosis and with previous treatment, was associated with a greater chance of presenting to the service with early clinical staging[9]. A study covering the variables of Hospital Cancer Registries, considering both analytical and non-analytical cases in a more recent historical series in the aforementioned study, has not yet been explored.

In this sense, the aim of this study is to describe the profile of prostate cancer patients who sought hospital care at a Brazilian High Complexity Oncology Center, as well as their condition on arrival at the center.

METHODS

This is a hospital-based descriptive observational study.

Data from the secondary database of the Hospital Cancer Registry (Registro Hospitalar de Câncer, RHC) of Afecc-Hospital Santa Rita de Cássia (HSRC) in the Espírito Santo state (ES), located in Brazil's southeastern region, was used. The Espírito Santo Oncology Care Network covers three health regions: North/Center, Metropolitan and South.[10,11] The Afecc-HSRC oncology hospital unit is the only High Complexity Oncology Center (Centro de Alta Complexidade em Oncologia, CACON) in ES, and is a reference for the entire ES state. The hospital is philanthropic and provides 60% of its services to patients from the Unified Health System (Sistema Único de Saúde, SUS). As a result, it also receives people from the south of Bahia, the east of Minas Gerais and the north of Rio de Janeiro. It has had a structured RHC up and running since 2000, with its databases forwarded annually to the Integrating System of the Hospital Cancer Registry (SIS-RHC). In addition, Afecc-HSRC has the Oncology Care Line, which establishes the flow of the care network in the Espírito Santo state, with the aim of reducing mortality from neoplasms, increasing the accessibility of procedures related to the cancer diagnosis and treatment and improving access to health services throughout the state.[12,13]

Initially, a total of 6545 observations (records of patients diagnosed with prostate cancer) were extracted from the Afecc-HSRC RHC database between 2000 and 2016.

The study included all analytical cases (whose planning and treatment is carried out at the hospital where the case was registered) and non-analytical cases (those who arrive at the hospital already treated or who do not carry out the recommended treatment, mainly)[14] of men over the age of 18 diagnosed with prostate cancer, based on the International Statistical Classification of Diseases and Related Health Problems - ICD 10 "C61: Malignant Prostatic Neoplasms", who received care at Afecc-HSRC via SUS (public) and non-SUS (private network) and who were registered in the Health Information System - Hospital Cancer Registry (SIS-RHC) in the period between January 1, 2000 and December 31, 2016, via the RHC tumor records of that Hospital. As for the type of referral, a total of 1112 observations were excluded, classified as "no information"; another nine classified as "not applicable"; and a further 21, with referrals of the "came on their own". The study population thus consisted of n = 5403 patients diagnosed with prostate cancer.

Data was collected between January and August 2021. The epidemiological variables were obtained from the tumor registration form of the Brazilian Hospital Cancer Registry Integrator (SIS-RHC)[13], namely: (1) age; (2) race/skin color; (3) education level; (4) place of origin; (5) marital status; (6) source of referral; (7) occurrence of more than one primary tumor; (8) previous diagnosis and treatment; (9) tests relevant to the diagnosis and treatment planning of the tumor; (10) first treatment received at the hospital; (11) most important basis for the diagnosis of the tumor; and (12) primary tumor histological type.

The RHC tumor registration form is used to gather information from the medical record, provide a summary of the case and as a data entry document for entering information into the SIS-RHC computerized databases.[14] This form's content is defined based on the information needs of hospitals with a hospital cancer registry and follows the standardization guidelines suggested by the World Health

Organization through the International Agency for Research on Cancer (IARC), validated by consensus in meetings coordinated by the National Cancer Institute (INCA).[14]

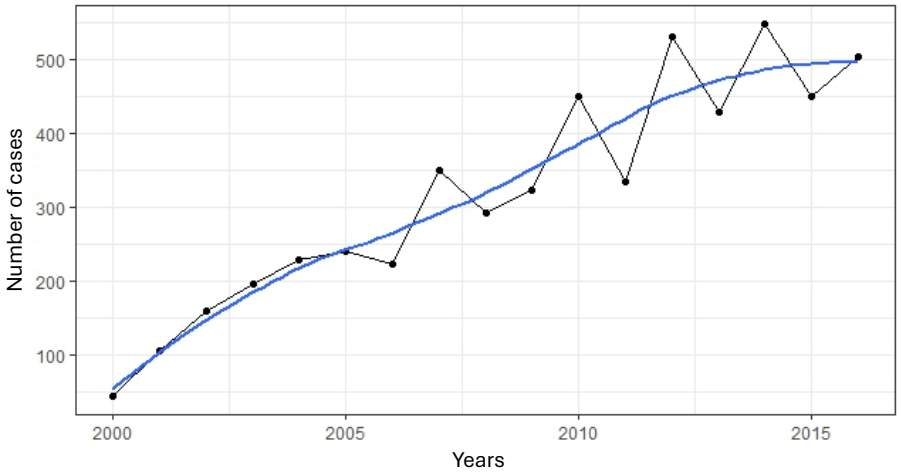
Numerical variables were presented with the mean, standard deviation and median, whereas categorical variables were presented with the observed and relative frequencies. The Mann-Kendall(15,16) trend test was used to test whether the historical series of the number of cases per year showed a trend. The entire statistical analysis process was carried out using the free software RStudio (version 2022.07.2) and R (version 4.1.0).

Ethical approval was obtained from the Research Ethics Committee of the Espírito Santo Federal University (under Opinion number: 5,533,541). In addition, approval and authorization was obtained from the Espírito Santo State Health Department, located in the capital Vitória, for the collection of secondary data and restricted data relating to this research.

RESULTS

The selected sample included 5,403 cases diagnosed with prostate cancer and registered at the RHC between 2000 and 2016. The historical series of the number of cases registered per year was 44 (2000), 105 (2001), 160 (2002), 195 (2003), 228 (2005), 240 (2005), 223 (2006), 349 (2007), 299 (2008), and 450 (2009), 105 (2001), 160 (2002), 195 (2003), 228 (2004), 240 (2005), 223 (2006), 349 (2007), 292 (2008), 323 (2009), 450 (2010), 334 (2011), 531 (2012), 428 (2013), 548 (2014), 449 (2015) e 504 (2016). **Figure 1** shows this historical series, which has no significant autocorrelation, as indicated by the Durbin-Watson test ($p = 0.9759$), where there is an upward trend in prostate cancer cases registered at the RHC between 2000 and 2016, confirmed by the Mann-Kendall test ($p < 0.001$).

Figure 1. Historical series of the number of prostate cancer cases from 2000 to 2016, registered at the Afecc-HSRC RHC (n=5403). Vitória, ES, Brazil, 2021.



Source: prepared by the authors (2021).

Of the 5,403 patients selected for the study, 3,990 (73.85%) were classified as analytical cases and the remaining 1,413 (26.15%) as non-analytical cases. According to the sociodemographic characteristics shown in **Table 1**, the mean age of the analytic patients was 69.26 (SD=8.71) years and a median of 69 years, while for the non-analytic patients it was 69.81 (SD=9.12) years and a median of 71 years. The majority of patients with prostatic neoplasia were aged 65 or over (71.45% of analytical cases and 70.84% of non-analytical cases), self-declared as brown (66.79% of analytical cases and 64.40% of non-analytical cases) or white (26.22% of analytical cases and 24, 63% of non-analytical cases), with incomplete primary education (54.51% of analytical cases and 48.27% of non-analytical cases), married (66.94% of analytical cases and 68.58% of non-analytical cases) and living in the Espírito Santo state (98.27% of analytical cases and 97.88% of non-analytical cases). The variables age ($p = 0.017$), race/skin color ($p < 0.001$) and education ($p < 0.001$) showed a statistically significant difference between the subgroups, whereas the variables age group ($p = 0.763$), marital status ($p = 0.066$) and state of residence ($p = 0.405$) showed no significant difference between the subgroups.

Table 1. Distribution of the number of prostate cancer cases from 2000 to 2016, for sociodemographic variables by type of case (analytical and non-analytical), recorded in the Afecc-HSRC RHC (n=5403). Vitória, ES, Brazil, 2021.

Variable		Case type				p-value
		Analytical		Non-analytical		
		N	%	N	%	
Age (in years old)						**0.017***
	Mean (Standard Deviation)	69.26 (8.71)	-	69.81 (9.12)	-	
	Median	69 (64-75)	-	71 (63 - 76)	-	
Age group						0.763**
	< 50 years old	47	1.18	16	1.13	
	50 - 54 years old	159	3.98	48	3.40	
	55 - 59 years old	319	7.99	123	8.70	
	60 - 64 years old	614	15.39	225	15.92	
	≥ 65 years	2851	71.45	1001	70.84	
Race/Skin color						**< 0.001****
	White	1046	26.22	348	24.63	
	Black	156	3.91	80	5.66	
	Brown	2665	66.79	910	64.40	
	Others	7	0.18	5	0.35	
	No information	110	2.76	70	4.95	
Education						
	Illiterate	562	14.09	158	11.18	
	Incomplete Elementary School	2175	54.51	682	48.27	
	Complete Elementary School	422	10.58	138	9.77	**< 0.001****
	Complete High School	360	9.02	200	14.15	
	Incomplete Higher Education	11	0.28	8	0.57	
	Complete Higher Education	80	2.01	72	5.10	
	No information	380	9.52	155	10.97	
Marital status						0.066 **
	Single	710	17.79	224	15.85	
	Married	2671	66.94	969	68.58	
	Widowed	336	8.42	120	8.49	
	Judicially separated	217	5.44	91	6.44	
	Consensual union	33	0.83	7	0.50	
	No information	23	0.58	2	0.14	
State of residence						0.405 **
	Espírito Santo	3921	98.27	1383	97.88	
	Other States	69	1.73	30	2.12	
Total		**3990**	**73.85**	**1413**	**26.15**	**-**

* MannWhitney's Test; ** Independence Pearson's Chi-Square Test; *** Fisher's Exact Test
Source: prepared by the authors (2021).

The data on the clinical variables are shown in Table 2, where, among the patients in the cohort, 77.87% of the analytical cases and 71.20% of the non-analytical cases had SUS as the source of referral, with primary prostate tumors (C61.9), with no other primary tumors (97.69% of the analytical cases and 98.37% of the non-analytical cases). Among the analytical cases, 81.48% arrived at the HSRC with a diagnosis and no previous treatment, whereas for the non-analytical cases, 49.68% arrived with a diagnosis and no previous treatment and 43.74% had a diagnosis and previous treatment. Tumor diagnosis and treatment planning based on tumor biomarkers (59.30% of analytical cases and 67.16% of non-analytical cases), hormone therapy in 28.60% of analytical cases and radiotherapy in 36.73% of non-analytical cases, the first treatment received at the hospital, histology of the primary tumor (99.60% of analytical cases and 99.36% of non-analytical cases) being the most important basis for diagnosing the tumor and the primary tumor being classified as adenocarcinoma (95.86% of analytical cases and 97.24% of non-analytical cases). The variables origin of referral ($p<0.001$), previous diagnosis and treatment ($p<0.001$), relevant tests for diagnosis and planning of tumor therapy ($p<0.001$), first treatment received at the hospital ($p<0.001$), showed evidence of a significant difference between the subgroups, whereas the variables occurrence of more than one primary tumor ($p=0.310$), most important basis for tumor diagnosis ($p=0.558$) and histological type of primary tumor ($p=0.051$), showed no difference

Table 2. Distribution of the number of prostate cancer cases from 2000 to 2016, for clinical variables by type of case (analytical and non-analytical), recorded in the Afecc-HSRC RHC (n=5403). Vitória, ES, Brazil, 2021.

Variable	Case type				p-value
	Analytical		Non-analytical		
	N	%	N	%	
Origem de Encaminhamento					
SUS	3107	77.87	1006	71.20	**< 0.001 ****
non-SUS (Private Network)	883	22.13	407	28.80	
Occurrence of more than one primary tumor					
No	3898	97.69	1390	98.37	0.310 ***
Yes	88	2.21	22	1.56	
Questionable	4	0.10	1	0.07	
Previous diagnosis and treatment					
No diagnosis / No treatment	408	10.23	77	5.45	**< 0.001 ****
With diagnosis / Without treatment	3251	81.48	702	49.68	
With diagnosis / With treatment	317	7.94	618	43.74	
Others	8	0.20	1	0.07	
No information	6	0.15	15	1.06	
Relevant tests for tumor diagnosis and treatment planning					
Pathological anatomy	1592	39.90	454	32.13	**< 0.001 ****
Tumor biomarkers	2366	59.30	949	67.16	
Other tests	8	0.20	7	0.50	
No information	24	0.60	3	0.21	
First treatment received at the hospital					
None	109	2.73	378	26.75	**< 0.001****
Surgery	890	22.31	87	6.16	
Radiotherapy	700	17.54	519	36.73	
Chemotherapy	19	0.48	9	0.64	
Hormone therapy	1141	28.60	275	19.46	
Other therapeutic procedures	1130	28.32	144	10.19	
No information	1	0.03	1	0.07	
Most important basis for tumor diagnosis					
Primary tumor histology	3974	99.60	1404	99.36	0.558***
Others	10	0.25	5	0.35	
No information	6	0.15	4	0.28	
Primary tumor histological type					
Adenocarcinoma, SOE	3825	95.86	1374	97.24	0.051**
Acinic cell carcinoma	264	6.62	31	2.19	
Others	25	0.63	8	0.57	
Total	**3990**	**73.85**	**1413**	**26.15**	**-**

* MannWhitney's Test; ** Independence Pearson's Chi-Square Test; *** Fisher's Exact Test

Source: prepared by the authors (2021).

The total number of cases diagnosed with prostate neoplasia from 2000 to 2016 that progressed to death, either from prostate cancer or other causes, up to 2017, was 638 patients, a total of 11.81% of the cohort.

DISCUSSION

As we can see from this study, increasing age is an important risk factor for prostate cancer, where some cases can even be seen in young men. However, the prevalence of this neoplasm is significantly higher in older men, as this cancer is generally a slow-developing disease with a long pre-clinical phase.[5,17] In the study cohort, men aged up to 50 accounted for just over 1% of cases, whereas 86.82% of these were men aged 60 or over. Furthermore, older men who have concomitant serious comorbidities during their lives are more likely to die from other related health causes or other diseases than from prostate cancer, long before they have any clinically manifested symptoms.[5,17,18]

According to the Brazilian Institute of Geography and Statistics (IBGE), around 90% of the Brazilian population is made up of browns and whites, so the race/skin color variable was presented in the cohort in question with 66.17% of men self-declared as brown, and another 25.80% as white. Among the subgroups, the non-analytical ones had a higher percentage of black patients and no information when compared to the analytical cases. Several studies have shown that race/skin color (or ethnicity) is a

risk factor for prostate cancer, with African-Americans and Asian-Americans having lower survival rates due to the greater aggressiveness of the cancer;[2,5,19] as well as socioeconomic disparities with late diagnosis and, consequently, more advanced stages of this neoplasm culminating in a higher mortality rate.[2,5,19] A study conducted in the USA revealed that black men had a 6% higher incidence and a 19% higher mortality rate than white men in general.[20]

Among the patients, 66.20% were illiterate or had not completed elementary school. In the subgroup analysis, non-analytic cases had a higher percentage of patients with middle and higher education than analytic cases. Similarly, a cohort of Swedish men with prostate cancer had 44% with low (42.4%) or no (1.6%) education level.[21] Some studies show that low education levels are associated with late diagnosis and treatment, reducing the patient's chance of cure and increasing mortality.[22] At the same time, patients' delay in seeking health services can be explained by a lack of information and access, and/or a lack of understanding of their current health situation,[23,24] causing the disease to progress.

The cohort had 67.37% married patients, with no difference between analytical and non-analytical cases. Married men generally make up the majority of prostate cancer cohorts.[19.25]

The primary tumor's histology was the main piece of information for diagnosing the tumor in 99.54% of cases. The primary tumor's histological type, identified in 99.39% of the cases in this cohort of men diagnosed with prostate neoplasia, was adenocarcinoma. Other studies of prostate cancer cohorts are in line with our findings.[19,24] A study conducted on the Surveillance, Epidemiology, and End Results (SEER) database of the National Cancer Institute (NCI) revealed that Asian American men had 98.75% of tumors of this type.[19] Darré et al. (2017) showed a predominance of adenocarcinomas in men with prostate cancer, in 95.6% of cases diagnosed in a hospital unit.[26] These variables showed no difference between analytical and non-analytical cases.

Most of the patients (97.87%) had only one primary tumor of the adenocarcinoma type (99.39%) and diagnosed based on the primary tumor's histology in 99.54% of the cases. Subgroup analysis shows that analytical cases arrive at the HRSC already diagnosed but without treatment (81.48%), while non-analytical cases are diagnosed without treatment (49.68%) or with treatment already started in 43.74% of cases. Tumor biomarkers and anatomopathological examinations were the most common techniques for diagnosing and planning the therapeutic treatment of the tumor in both subgroups. Hormone therapy was the treatment most commonly used as the first treatment, in 28.60% of analytical cases; while, for non-analytical cases, the choice of first treatment was radiotherapy (36.73%). A study conducted in Brazil, using data from DATASUS, showed that chemotherapy was the most commonly used first treatment in 32.6% of cases, followed by radiotherapy combined with chemotherapy in 25.7%, radiotherapy in 22.1% and surgery in 19.6%[16]. Braga et al. (2017) evaluated a database with SUS data on prostate cancer between 2002 and 2003 in Brazil, and this cohort had hormone therapy as initial treatment in 61.2% of cases, followed by radiotherapy with 37.9%.[27] In a study of non-Hispanic white and black men diagnosed with localized non-metastatic prostate cancer at intermediate or high risk and identified in the Massachusetts Cancer Registry, USA, surgery was the first treatment in 30.4%, followed by radiotherapy in 14.3%.[28]

A study carried out in Espírito Santo which aimed to assess the association of sociodemographic and clinical variables with the time taken to start treatment for prostate cancer at the Afecc-HSRC showed that the study population consisted of 1,388 men. Of the total, those aged under 70, non-white, with less than eight years of education and referred by the Unified Health System had a higher risk of delaying treatment. Similarly, the lower the Gleason score (OR = 1.78; CI = 1.37-2.32) and Prostate Specific Antigen levels (OR = 2.71; CI = 2.07-3.54), the greater the likelihood of delay in starting treatment.[29]

showed, in a study of a prostate cancer cohort from the Afecc-HSRC HRC from 2000 to 2016, that important clinical variables had high percentages (> 50%) of missing observations, making it impossible to use these variables to compose the profile of these patients. A more recent study, which aimed to analyze the completeness of the HRC variables of prostate cancer cases from the entire Oncology Care Network in Espírito Santo between 2000 and 2020, showed that among the 13. 519 prostate cancer cases in the RHCs analyzed, the variables "family cancer history" ($p < 0.001$), "alcoholism" ($p < 0.001$), "smoking" ($p < 0.001$), "TNM staging" ($p < 0.001$) showed a downward trend in data completeness, whereas "clinic at start of treatment" ($p < 0.001$), "origin" ($p = 0.008$) and "occupation" ($p < 0.001$) showed an upward trend.[30]

The number of deaths in the cohort was 638 patients, which represents 11.81% of the total number of men at risk of death, a lower number when compared to other studies using the SUS database,

such as the 45.3% death rate reported by Braga et al. (2017)[27], and the 44.8% death rate in another study by the same authors[18]. This difference may be due to the fact that these are population-based studies, since hospital-based data show more optimistic survival results.[31] In the USA, studies using the SEER database showed mortality rates of 17.71 and 13.59%[25] of the total cohort.

An inherent limitation of all secondary databases is that some variables have considerable levels of non-completeness. In addition, this study's limitations are related to possible information and selection bias, as a secondary data source was used and is subject to variations in records and not all information being filled in.

It should be emphasized that characterizing the profile of prostate cancer patients at a CACON, as well as their condition on arrival at the center, can help mitigate the direction of public policies in the area of oncology, with a view to programming measures and assertive actions in cancer surveillance at the different health care levels to improve men's health care.

CONCLUSION

The analyses show a tendency for the incidence of prostate cancer to increase over the years, with prostate neoplasia showing a tropism for older, married men with a low education level. Subgroup analysis showed that analytical and non-analytical cases differed mainly in terms of previous diagnosis and treatment and the therapy chosen to treat prostate cancer.

CONTRIBUITIONS

Contributed to the conception or design of the study/research: Grippa WR, Lopes-Junior LC. Contributed to data collection: Grippa WR, Lopes-Junior LC. Contributed to the analysis and/or interpretation of data: Grippa WR, Lopes-Junior LC. Contributed to article writing or critical review: Grippa WR, Lopes-Junior LC, Salaroli LB. Final approval of the version to be published: Grippa WR, Lopes-Junior LC, Salaroli LB.

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