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ORIGINAL ARTICLE

Sexual desire of French representative prostate cancer survivors 2 years after diagnosis (the VICAN survey)

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Abstract

Purpose The prostate cancer impacts on the future life of survivors. The complexity of sexual health problems in prostate cancer survivors is underestimated or often reduced to the erectile dysfunction. Especially, factors influencing sexual desire of patients have to be more explored. This study aims to describe the therapeutic management of patients with prostate cancer and assess their sexual desire 2 years after diagnosis.

Methods This study is part of the National VICAN survey (Vie après le CANcer) implemented in France in 2012. This analysis was performed on a population of 414 men who had prostate cancer. The questionnaire dealt with several topics including socioeconomic status, treatments received, and sexual desire.

Results Prostatectomy (42.8%), radiotherapy + hormonotherapy (17.6%), and radiotherapy alone (12.8%) were the main treatments used. 41.3% of men stated that their sexual desire was all gone since disease. The "satisfying" perceived financial situation was significantly associated to a sexual desire loss ($p = 0.008$). Radiotherapy + hormonotherapy treatment only is significantly associated with a loss of sexual desire ($P = 0.003$).

Conclusions Two years after diagnosis, the sexual desire of prostate cancer survivors is deteriorated with the cancer experience. However, clinical characteristics do not seem to be decisive unlike a "satisfying" financial situation. Research about the impact of socio economics characteristics on sexual health should probably be engaged. Programs have to be developed in France to have personalized sexual support progressed for survivors and take spouses into consideration in this context.

Keywords Cancer · Sexuality · Desire · Prostate · Survivors · Quality of life

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Introduction

Cancer is considered as a chronic disease with prospects for cure and long-term survival thanks to medical advances, especially early diagnosis and better cancer management. Prostate cancer is the most frequent men cancer in France, according to the French National Cancer Institute (INCa) and yet represents the fourth highest mortality rate [1]. With a global increase to 1.7 million cases in 2030 [2] it is an important public health issue which impact on the future life of patients has to be considered. Whatever the treatment—prostatectomy, radiotherapy, brachytherapy, hormonal treatment, high-intensity focused ultrasound and/or cryotherapy—various and multiple disorders, chronic or not, may occur at different time: anejaculation, penile shrinkage, urinary incontinence, bowel dysfunction, etc. An important number of men with a prostate cancer experienced a long-term impact on functional outcomes [3]. If prostate cancer seems to affect the quality of life of patients like degradation of the mental and physical state quality (30.6% and

24.6% respectively), it is also responsible of particular issues on sexuality, considering its anatomic localization and normal functions [4–7].

Sexuality is a complex process including anatomical, physiological, psychological, development, cultural, and relational facets. All of these factors contribute to the individual sexuality throughout life. According to Montgomery et al. [8], sexuality is an interplay between sexual identity, sexual function with desire, arousal and orgasm, and emotional satisfaction. However, most of scientific publications interested in sexuality reduce it to anatomic and functional characteristics. In prostate cancer, sexuality is often forgotten either because of the elderly population—however, in France, the aged population (over 70) is sexually weekly active for 45.4%, and represents 63% for those living happily in couple [9]—or because sexual disorders are restricted to the erectile dysfunctions. The complexity of sexual health problems is thus underestimated. Erectile dysfunction is observed in 88% of patients treated for prostate cancer [10], but other measures have to be considered for assessing the sexual life of patients. Dahn et al. (2004) suggest that both sexual desire and sexual functioning are necessary for an optimal quality of life [11]. Sexual desire, which is our concern in the present study, is a combination of three biopsychosocial elements according to Levine et al. [12, 13]: (1) biological drive including the anatomy and the neuroendocrine system (crucial role of testosterone), (2) psychological motivation (mental, relational, and social context), and (3) wish including values and rules in sexuality. Few studies [14, 15] found interest in factors influencing and interacting with the sexual desire in men but it remains incomplete. A major part of prostate cancer survivors reports a decrease of their sexual desire 2 years after the diagnosis and an impact on the frequency of sexual intercourses [6]. The question of preservation of conjugal life also arises in this context [16, 17], like difficulties with body image, masculinity, and self-esteem [18].

This study, part of the National VICAN survey (Vie après le CANcer) implemented in France in 2012 [19], describes the therapeutic management of patients with a prostate cancer and assesses their sexual desire 2 years after diagnosis.

Methods

The VICAN survey was initiated to document life after cancer 2 years after diagnosis. Eligible participants were all adult survivors diagnosed with a first malignant cancer between January and June 2010, registered in one of the three main health insurance schemes. Eligibility was restricted to French-speaking survivors who have been living in France for at least 2 years. Participants were survivors of one of the following 12 tumor sites, which accounted for 88% of global cancer incidence in France in 2012: breast, lung, colorectal, prostate, upper aerodigestive tract, bladder, kidney, cervical, endometrial, thyroid, Non-Hodgkin lymphoma, and melanoma. Data collection was performed between March and December 2012. Each selected survivor received a letter from the National Health Insurance Fund inviting him/her to participate in the survey. Participants had to sign and send back an informed consent form before being interviewed through the Computer-Assisted Telephone Interview system (CATI). A medical survey was also conducted with their physicians in charge between March 2012 and March 2013 and was completed for 87.7% of participants. The final sample size was $N = 4349$ with a global response rate of 43.7%. The study methodology and data collection procedure were described in detail by Bouhnik et al. [19].

In the present study, we benefit from this VICAN national strong documentation about cancer survivors to focus on prostate cancer survivors ($n = 414$), especially their clinical management and their sexuality. Of note, the VICAN survey was not initially conceptualized in this aim.

Data collected 2 years after diagnosis

The VICAN CATI questionnaire included topics like sociodemographic and socioeconomic status, employment, couple relationships, treatments received, and perceived side effects. It also included scales approved for evaluating quality of life, fatigue, and pain. Health-related quality of life was assessed using the French version of the SF12 scale [20]. Cancer-related fatigue was evaluated using the EORTC QLQ scale [21].

Three sources of data, survivor questionnaires, medical surveys, and medico-administrative databases, were used to collect medical information. The medical questionnaire covered the pathological assessment of cancer (histology, stage) and information on treatment.

Information collected from the national database SNIIRAM included financial reimbursement data and hospital discharge records [22].

Measurements

Cancer progression 2 years after diagnosis

An indicator of cancer progression at the time of the survey was also built for every participant (metastases, second cancer diagnosed since 2011, treatment with chemotherapy, radiotherapy or targeted therapy in 2012, admission to a palliative care unit in 2012, and death).

Impact of disease on sexuality

In the VICAN design questionnaire, deterioration of sexuality was evaluated using three items from the "*Relationship and Sexuality Scale* (RSS)" validated by Berglund et al. [23]. One item measured the number of sexual intercourses in the prior 2 weeks (no time/once/twice/three times/at least four times/inadequate question). Another item measured the perceived change in frequency of sexual intercourse since diagnosis (increased/no difference/decreased/inadequate question). The third item measured the survivors' perception in terms of impact of the disease on sexual desire (increased/no difference/decreased/all gone/inadequate question).

Statistical analyses

Chi-squared tests, Fisher's exact tests, and *t* tests were used in univariate analyses. Then, to identify the factors independently with the impact of disease on sexual desire, logistic models were used. A stepwise procedure was used to select statistically significant factors in a multivariate model (entry threshold $p < 0.20$). Only factors that remained associated with a p value ≤ 0.05 were finally kept in model. Statistical analyses were performed using PASW Statistics 18 version 18.0.3 software.

Results

Study population

The mean age was 68.6 (SD = 6.6) at the time of interview, and 40.9% had at least a high school certificate.

Regarding the severity of the cancer, 186 (44.9%) had a Gleason score below 7, 176 (42.5%) had a score of 7, and 47 (11.4%) had a score over 7. Moreover, 379 (91.5%) of these men had not had any cancer progression since the diagnosis.

Medical care of the population

The main therapeutic combinations are presented in Table 1. Prostatectomy, radiotherapy + hormonotherapy, and radiotherapy alone are the principals therapeutics used. Other combinations encountered involved less than 10% of patients (Table 1).

The therapeutic combination was strongly associated with the Gleason score ($p < 0.001$). The proportion of men treated with radiotherapy + hormonotherapy increased with the severity of cancer: from 6.5% for Gleason below or equal to 6, to 46.8% for Gleason scores above or equal to 8. The proportion of men treated with radiotherapy alone decreased with the severity of the cancer, from 17.7 to 0%.

Table 1 Therapeutic combinations used for the treatment of $n = 414$ men survivors 2 years after diagnosis of prostate cancer

Therapeutic combination	*n*	%
Prostatectomy	177	42.8
Radiotherapy + hormonotherapy	73	17.6
Radiotherapy alone	53	12.8
Prostatectomy + radiotherapy or curitherapy	34	8.2
Supervision only	28	6.8
Hormonotherapy alone	16	3.9
Curitherapy alone	13	3.1
Prostatectomy + hormonotherapy	6	1.4
Others	14	3.4

The treatment received was also associated with age, patients treated with prostatectomy being younger than those treated with radiotherapy + hormonotherapy (mean age = 72.0, SD = 6.4) and those treated with radiotherapy alone (mean age = 65.7 (SD = 5.3) versus 72.0 (SD = 6.4) and 73.4 (SD = 5.4) respectively, $p < 0.001$).

Treatments were also associated with different levels of fatigue, hormonotherapy + radiotherapy being associated with higher levels of clinically significant fatigue (46.6% versus 24.3% for prostatectomy and 28.3% for radiotherapy alone, $p = 0.001$).

Couple, number of intercourse, and perceived change in frequency of sexual intercourse since diagnosis

A great majority of men (92.8%, $n = 384$) had been living with a partner at diagnosis. Two years after, 368 (95.8%) of them reported living with the same person.

Only 30.4% of men reported a sexual activity within 15 days before the survey. Forty-five point four percent reported no sexual activity and 24.2% perceived this question as inadequate. The proportion of men reporting a sexual activity in the prior 15 days, decrease with age, from 51.5% of the 50–59-year-old men, to 32.4% of the 60–69 years and 17.6% of the 70–82 years.

The sexual activity during the previous 2 weeks was strongly associated with the perceived change in frequency of sexual intercourse since diagnosis ($p < 0.001$). Thirty-seven point four percent of men who reported that the frequency of their sexual intercourse had decreased since cancer diagnosis, stated at least one sexual intercourse in the last 2 weeks, versus 66.7% of those who reported no difference or an increased frequency ($n = 2$ for this last one).

Factors associated with the loss of sexual desire

Forty-one point three percent of men stated that their sexual desire was all gone since the diagnosis. No socio-demographic

factor was associated with sexual desire loss except for perceived financial situation. Men reporting a wealthy situation report less frequently sexual desire loss (Table 2). Men reporting an experience of discrimination because of the disease also tended to report more often a loss of sexual desire like those reporting important sequelae. Regarding medical characteristics, a Gleason score above 7, with a progressive cancer, and radiotherapy + hormonotherapy treatments were factors associated with the loss of sexual desire in univariate analyses. Men reporting sexual desire loss reported also higher level of fatigue, a lower percentage of sexual activity, and lower scores of physical and mental quality of life.

After multiple adjustments, other treatments than prostatectomy or radiotherapy, especially radiotherapy + hormonotherapy remained associated with a loss of sexual desire. Perceived financial situation, fatigue, important sequelae of the disease, and sexual frequency (no sexual activity in the prior 15 days, or considering this question as inadequate) are also significantly associated with a sexual desire loss (Table 3).

Discussion

This study describes therapeutic management and assesses sexual desire of prostate cancer survivors 2 years after diagnosis.

With the growth of the older population, the sexuality in elderly people with prostate cancer has been a subject of increasing interest for several years. The concept of sexually active life expectancy has been revealed [24], and implementation of researches on this thematic developed especially thanks to the democratization of drugs to help men with erectile dysfunction. However, there is a lack of studies on some sexuality topics of elderly men with prostate cancer among which sexual desire. Still, in men in general, sexuality remains an important element of life after 60 [25]. Majority of old men have a preserved feelings of sexual desire [26]. In this study, the perceived financial situation, a socio economic variable, seems a determinant associated factor of the sexual desire decrease (i.e., hypoactive sexual desire [27]). Surprisingly, this suggests that social precariousness feeling affects the sexual desire of survivors 2 years after a prostate cancer diagnosis. It could be expected that strong material difficulties are stressful, and the worry about them probably does not encourage development of feelings, seduction and/or a sexual process, but this study highlights the impact of an intermediate—satisfying—perceived financial situation on libido. No study has taken any interest in the relationship between financial stress, sexual behavior, and feelings of patients with cancer so far. Sharp et al. [28] investigated associations between cancer-related financial stress and strain and psychological well-being but only on depression, anxiety, and distress factors. Consequently, research about the impact of socio economics characteristics on sexual health should be engaged.

Majority of cancers has negative impact on men sexuality, and literature admits a significant rate of sexual health impairment in men with prostate cancer [29–31]. This is confirmed in this study where almost half of the population having inexistent sexual life and a decrease of the sexual desire. Erectile function, libido, ejaculations can also be affected by tumor or treatments [3, 17, 32] just like psychological and emotional sexual functioning, a recurrent problematic for patients [7, 17, 33]. In this study, the sexual desire is associated with the fatigue perceived by survivors. This is classically observed in oncologic issues [31]. Yet, it seems delicate to bring significance to this factor because of the age of the population and potential comorbidities, which were not collected in the present study. These factors can nevertheless influence the general state of fatigue in addition to cancer and its treatments. Perceived significant sequelae are also significantly associated with the sexual desire decrease. Surgical sequelae are the most obvious to consider in the problematic of erectile nerves. However, patients are even so prepared to suffer the inevitable physical and psychological sequelae because they consider the surgery to be a definitive solution for cancer [34]. Actually, several solutions (medical and/or mechanical) can be proposed to men with temporary or definitive erectile dysfunction. Nevertheless, men with significant sequelae and sexual desire impairment have to psychologically assess and admit a new sexual self-image. They have to accept they cannot return to their precancerous performance and to adjust their beliefs concerning their masculinity [35].

It has been previously shown for prostate cancer that treatment's adverse effects negatively impact general physical condition of men, and also interfere with sexual function [36]. We thus expected medical criteria to be determinant on the sexual desire in our study. However, it appeared that only treatments using radiotherapy supplemented with hormonotherapy implied a significant decrease of the sexual desire. Testosterone has a primary role in controlling and synchronizing male sexual desire and arousal, acting at multiple levels [37], consequently, a potentially long hormonotherapy treatment, is determinant for libido [38]. Combined to radiotherapy, it can be restrictive for patients and therefore not conducive to the development of sexual desire. We also have to note, in this study, that men without any treatments for their prostate cancer tend to have less sexual desire loss than men treated. It could be thus interesting to further investigate sexual aspects including sexual desire of men with active surveillance.

Finally, medical factors do not seem to be so important in terms of impact on sexual desire of our prostate survivors, it could be then interesting to develop works in agreement with Carvalho et al. [14], who consider that the importance of cognitive factors surpasses medical ones in the men sexual desire conceptualization.

Table 2 Factors associated with the complete loss of sexual desire among men treated for prostate cancer, 2 years after diagnosis—univariate analyses—VICAN (Vie après le CANcer) survey (n = 414)

Sexual desire all gone since diagnosis				
n (% row)	No n = 243 (58.7%)	Yes n = 171 (41.3%)	Total n = 414	p value*
Socio-demographic characteristics	n (% column)			
Age at diagnosis				
50–59	45 (18.5)	23 (13.5)	68 (16.4)	0.098**
60–69	121 (49.8)	83 (48.5)	204 (48.5)	
70–82	77 (31.7)	65 (38.0)	142 (34.3)	
Age at diagnosis (mean (SD))	67.9 (6.7)	69.6 (6.4)	68.6 (6.6)	0.008
Living as a couple at time of survey				
Yes	208 (85.6)	147 (86.0)	355 (85.7)	0.885
No	35 (14.4)	24 (14.0)	59 (14.3)	
Perceived financial situation				
Wealthy	54 (22.2)	21 (12.3)	75 (18.1)	0.018
Satisfying	80 (32.9)	73 (42.7)	153 (37.0)	
Difficult	109 (44.9)	77 (45.0)	186 (44.9)	
Medical characteristics				
Gleason score				
2 to 6	120 (49.4)	66 (38.6)	186 (44.9)	<0.001***
7	106 (43.6)	70 (40.9)	176 (42.5)	
8 to 10	15 (6.2)	32 (18.7)	47 (11.4)	
Missing value	2 (0.8)	3 (1.8)	5 (1.2)	
Therapeutic combination				
Prostatectomy	119 (49.0)	58 (33.9)	177 (42.8)	< 0.001
Radiotherapy + hormonotherapy	29 (11.9)	44 (25.7)	73 (25.7)	
Radiotherapy alone	31 (12.8)	22 (12.9)	53 (12.8)	
Prostatectomy + radiotherapy/curitherapy	14 (5.8)	20 (11.7)	34 (8.2)	
Supervision only	21 (8.6)	7 (4.1)	28 (6.8)	
Hormonotherapy	3 (1.2)	13 (7.6)	16 (3.9)	
Curitherapy	9 (3.7)	4 (2.3)	13 (3.1)	
Prostatectomy + hormonotherapy	3 (1.2)	3 (1.8)	6 (1.4)	
Other	14 (5.8)	–	14 (3.4)	
Cancer progression since diagnosis				
No	227 (93.4)	152 (88.9)	379 (91.5)	0.103
Yes	16 (6.6)	19 (11.1)	35 (8.5)	
Anxiolytics consumption in the 3 months prior survey				
No	223 (91.8)	144 (84.2)	367 (88.6)	0.017
Yes	20 (8.2)	27 (15.8)	47 (11.4)	
Survivors self-reported outcomes				
Pain experience in the prior 15 days				
No	210 (86.4)	141 (82.5)	351 (84.8)	0.269
Yes	33 (13.6)	30 (17.5)	63 (15.2)	
Important perceived sequelae				
No	182 (74.9)	182 (74.9)	290 (70.0)	0.010
Yes	61 (25.1)	63 (36.8)	124 (30.0)	
Fatigue score clinically significant				
No	189 (77.8)	93 (54.4)	282 (68.1)	<0.001***
Yes	53 (21.8)	77 (45.0)	130 (31.4)	
Not available	1 (0.4)	1 (0.6)	2 (0.5)	
Physical quality of life score (mean (SD))	47.8 (9.4)	45.3 (9.7)	46.8 (9.6)	0.008
Mental quality of life score (mean (SD))	49.4 (8.5)	46.4 (10.2)	48.1 (9.5)	0.001
Experience of discrimination because of disease				
No	241 (99.2)	164 (95.9)	405 (97.8)	0.037
Yes	2 (0.8)	7 (4.1)	9 (2.2)	
Sexual frequency in the prior 15 days				
0	80 (32.9)	108 (63.2)	188 (45.4)	< 0.001
>= 1	113 (46.5)	13 (7.9)	126 (30.4)	
Inadequate question	50 (20.6)	50 (29.2)	100 (24.2)	

*Chi-squared test or Fisher's exact test when appropriate

**Chi-squared test for trend

***p value calculated on non-missing values

Table 3 Factors associated with the complete loss of sexual desire among men treated for prostate cancer, 2 years after diagnosis—multivariate analyses—VICAN (Vie après le CANcer) survey ($n = 414$)

	OR[a]	CI (95) [b]	*p* value
Perceived financial situation			
Wealthy	1		
Satisfying	2.6	1.3–5.3	0.008
Difficult	1.7	0.8–3.3	0.147
Therapeutic combination			
Prostatectomy	1		
Radiotherapy + hormonotherapy	2.7	1.4–5.3	0.003
Radiotherapy alone	1.7	0.8–3.6	0.160
Prostatectomy + radiotherapy/curitherapy	2.9	1.0–3.8	0.024
Supervision only	1.0	0.4–3.0	0.942
Hormonotherapy	6.3	1.5–27.1	0.014
Curitherapy	1.9	0.5–7.8	0.366
Prostatectomy + hormonotherapy	1.3	0.2–7.3	0.750
Other	–	–	–
Fatigue score clinically significant			
No	1		
Yes	2.1	1.2–3.6	0.005
Important perceived sequelae			
No	1		
Yes	1.6	0.9–2.7	0.097
Sexual frequency in the prior 15 days			
0	11.0	5.5–21.7	< 0.001
>=1	1		
Inadequate question	6.3	3.0–13.2	< 0.001

[a] Odds ratio; [b] 95% confidence interval

Strengths and limitations

The VICAN is a strong national representative study, our sample being randomly selected from one of the three main Health Insurance Schemes.

The VICAN study was not intended to analyze sexuality of prostate cancer survivors, and the design and tools are consequently not perfectly adapted to this aim. In particular, sexual activity was measured using a single item based on the previous 2 weeks. Although this measure was associated with the perceived change in frequency of sexual intercourse since cancer diagnosis, it is a rather short timeframe to estimate current sexual activity. However, the study does present a strong interest concerning the access to a non-biased respondent population, especially concerning questions about sexuality.

The literature indicates that the sexual function prior to the diagnosis is a good indicator of post-sexual function in the aging population; unfortunately, this kind of data was not provided in the development of the VICAN study. Comorbidities of patients are also missing.

Moreover, there is a lack of interest showed to spouses particularly in this prostate disease context.

Finally, the study may have a possible social desirability bias due to the CATI process.

Clinical implications

Prostate cancer survivors suffer physically and psychologically from long-term disorders in several domains [4], especially in sexuality, intimacy, and relationships. In this study, it has been demonstrated a disappearance of sexual desire 2 years after diagnosis in a majority of survivors. Nevertheless, a need of information about the possible consequences has been demonstrated [4, 39]. More than half of the patients report scarce or non-existent discussions about these problematics [40], and high sexual burden is associated with greater need for information about relationships [4]. For survivors, the will of discussion about sexuality may depend on the importance they granted to it before the disease. Hyde et al. [39] reported that "men who are more emotionally self-reliant and viewed sex as highly important to their identity also formed stronger intentions to seek help". Men asking for help are younger, available sexual partners, in good physical and psychological health, educated, and a good financial well-being [41]. On the other hand, patients uncomfortable about this topic should count on a spontaneous help from health services [42]. But sexuality still seems to be a taboo topic for medical staff because only a third of patients report a discussion about sexuality engaged by medical professionals. Yet, their role appears essential for patients [43] but also for their spouses considering the impact of the prostate cancer on the intimacy life in couples [44]. Consequently, programs should be developed in France to have personalized sexual support progressed for survivors, e.g., training courses for medical staff. The initiation of the discussion about patients's and their partners's concerns should not lay with them. In our concern, a systematic approach from the medical staff during consultations only could overcome the silence about sexuality. Simultaneously, the development of specialized facilities for sexual problems exchange should continue/increase.

Conclusions

Two years after diagnosis, the sexual desire of prostate cancer survivors is deteriorated with the cancer experience. However, clinical characteristics seem not decisive, unlike a perceived financial situation of survivors. Research about the impact of socio economics characteristics on sexual health should probably be engaged. Moreover, exchanges about sexual health in the medical context in France must improve for prostate survivors and also for their partner, and programs on sexual support should be developed and included in health care system and in the initial medical education and trainings.

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Compliance with ethical standards

Conflicts of interest The authors declare that they have no conflict of interest.

Ethical approval All procedures performed in studies involving human participants were in accordance with ethical standards of the institutional and/or national research committee (the CCTIRS: Comité Consultatif sur le Traitement de l'Information en Matière de Recherche dans le Domaine de la Santé, study registered under no 11-143, the ISP: Institute of Public Health, study registered under no C11–63 and the CNIL: French Commission on Individual Data Protection and Public Liberties, study registered under no 911290) and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed consent Informed consent was obtained from all individual participants included in the VICAN study.

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