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Assessing The Sexual Profile Of Patients Treated For Localized Prostate Cancer.

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ABSTRACT

INTRODUCTION: Impotence is a common occurrence after irradiation. It occurs in 60 to 70% of patients [1]. In the PCOS study, 43% of patients who reported being sexually active before irradiation became secondarily impotent [2]. Erectile dysfunction occurs progressively over 2 to 3 years. The psychological and emotional impact of sexual changes is significant. Two-thirds of patients experience at least one of three repercussions: loss of masculinity, loss of self-esteem or performance anxiety.

OUR OBJECTIVE: To assess the sexual profile of patients irradiated for localised prostate cancer.

MATERIALS AND METHODS: Retrospective descriptive and analytical study, carried out in the biochemistry department of EHU-Oran, 89adult male patients with localized prostate tumors after radiotherapy from October 11, 2016 to June 11, 2021. All patients had an initial testosterone determination on a dry tube then 3 months after external radiotherapy (70-76 grays) with regular follow-up at 6, 9, 12, 18 and 24 months, on Cobas e411 ROCHE machine with 2 quality controls.
A questionnaire was sent to the patients to evaluate their sexuality and its variations according to the variations of the testosteronemia before and after the radiotherapy treatment.

RESULTS: After treatment 37 patients lost orgasm completely against 41 patients who kept it inconsistently. The interrelation of medical treatment and patient satisfaction was highly significant with a $p < 10\text{-}3$. Of the 89 patients in the series, only 71 patients (79.8%) agreed to take the medical treatment for their erectile dysfunction, orgasm and ejaculation disorders, only 44 patients were satisfied with their therapy and 27 patients were not satisfied due to several reasons including age, comorbidities, diabetes and the patient's psycho-affective state.

DISCUSSION: Testosterone levels at baseline have an important prognostic value for the subsequent assessment of sexual function and its evolution. A persistent decrease in sexual desire should lead to a search for a testosterone deficiency syndrome, and the recommendations of the learned societies involved make it possible to consider replacement therapy under certain conditions.
The variations in the mean values of testosterone are very significant and this at each control $p < 0.05$. We note a decrease in the mean values of testosterone in a gradual way since the control at 3 months, then 6 months, 9 months, 12 months, 18 months and 24 months in post radiotherapy and this value decreases in favour of the therapeutic response and the favourable evolution of the states of the patients but in the cases of too low values that influences the sexuality of the patients unfavourably because the higher the dose of irradiation is, the more the damage is important. The behaviour of the patients according to the absence of ejaculation varies strongly according to their age and this in a significant way $p < 10\text{ -}3$,

CONCLUSION: Protocols for the management of sexual difficulties in prostate cancer vary according to the type of carcinological treatment chosen. Their early implementation ensures the best chances of recovery. Assessment of sexuality prior to diagnosis is essential. Reconstruction of sexual function is possible and contributes greatly to the improvement of the patient's emotional state. The emotional and relational impact of prostate cancer is significant and should not be neglected.

Key words: Prostate cancer, radiotherapy, testosterone, sexual disorders, emotional state

FULL-TEXT

I. INTRODUCTION:

Treatment of prostate cancer with external radiotherapy and brachytherapy can damage nerve bundles involved in erection. The effects of radiotherapy on erection vary. The amount of radiation given to the prostate and the base of the penis (penile bulb) near the scrotum may affect the risk of developing impotence: the higher the dose of radiation, the greater the risk [1].
Impotence is a common occurrence after irradiation. It occurs in 60 to 70% of patients [2]. In the PCOS study, 43% of patients who reported being sexually active before irradiation became secondarily impotent [3]. Erectile dysfunction occurs progressively over 2-3 years and stabilises later, although 30-50% of men retain their usual erectile function at 5 years after external beam radiotherapy [4]. The main prognostic factors for the occurrence of erectile dysfunction are older age and the quality of erectile function before treatment. Other factors are also likely to play a role, such as the patient's vascular or psychological status [5]. As with surgery, a man who has undergone radiotherapy retains his sexual desire (libido) and ability to have orgasms [3].

The psychological and emotional impact of sexual changes is significant. Two-thirds of patients experience at least one of three impacts: loss of masculinity, loss of self-esteem or performance anxiety. Loss of masculinity affects the most patients (61.9%) [5, 6, 7]. This loss of masculinity could be the cause of relationship problems with women in their daily lives and a change in their intimate life and fantasies [4, 8, 9]. Low self-esteem and performance anxiety at the thought of having sex is reported by patients with rates reported in the literature (75% for low self-esteem [5,7,10], 28-70% for performance anxiety [7,11,12]). Therefore, a good assessment of a possible post-radiation sex life would give hope for a cure to patients and a better future.

OUR OBJECTIVE: To evaluate the sexual profile of patients irradiated for localized prostate cancer.

II. MATERIALS AND METHODS:

This is a retrospective descriptive and analytical study with retrospective collection, carried out in the biochemistry department of the EHU-Oran, in adult male patients with localized prostate tumors after radiotherapy from October 11, 2016 to June 11, 2021. The structures of origin are the urology service of the CHU-Oran, the EHU-Oran, the liberal practitioners and the radiotherapy services of the CHU-ORAN and the CAC.

Inclusion criteria	**Exclusion criteria**
age ≥ 50 years	
localized cancer without metastasis	**metastasized cancer**
TNM class: T0 to T2c N0M0	**TNM stages 3 and 4**
Gleason score lessthan 8	**Gleason score greater than 8**
radiotherapyprotocol	**patients who have undergone radical treatment (total prostatectomy).**
patients who underwent biopsy	
The presence of comorbidities does not exclude	

the patient	

All patients had an initial testosterone determination on a dry tube and then 3 months after external radiotherapy (70-76 grays) with regular follow-up at 6, 9, 12, 18 and 24 months, on a Cobas e411 ROCHE machine by electro-chemiluminescence. The assays are performed with quality controls PCU1 and PCU2.

A questionnaire was sent to the patients to evaluate their sexuality and its variations according to the variations of the testosteronemia before and after the radiotherapy treatment. Changes in testosterone levels were monitored in relation to sexual activity. The questions addressed to the patients were taken from questionnaires studied and validated by the different randomised studies and learned societies [13]

Distribution of patient treatment	**TREATMENT**			
	70 Gray		**76 Gray**	
	1st part	**2nd part**	**1st part**	**2nd part**
	50Gray	**20 Gray**	**56 Gray**	**20 Gray**
Number of patients	**24**		**75**	

Distribution of patients by treatment dose

Data collection:

- **Quantitative data**: expressed as: mean +/- standard deviation. T-test: to compare the means of the variables
- **Qualitative data**: Pearson's chi-square test (x 2) and the test of the reduced deviation with a significance threshold of α = 5%.
- **Multi-variate analysis**: Cox model: The final model included variables that were significant at P ≤ 5%. Linearity of quantitative variables was tested on Stata 12.Data were processed on Epi-info version 3.5.3 january 26,2011, and on SPSS version 20.0.

III. RESULTS :

1. Patients' orgasm status before and after radiotherapy treatment:

- Before treatment 18 patients had no orgasm, after treatment 17 of them lost it completely and only one kept it inconsistently.

- The 11 patients who had normal orgasms, after treatment 7 kept it and 4 inconsistently.

- Before treatment 60 patients did not have regular orgasms and 37 of them remained in this state, 20 lost it and only 3 recovered it.

2. Distribution of patients who received medical treatment for their sexual disorders according to their satisfaction :

The interrelationship between the use of medical treatment and the notion of patient satisfaction is highly significant with a $p < 10\text{-}3$. Of the 89 patients in the series, only 71 patients (79.8%) agreed to take medical treatment for their erectile dysfunction, orgasm and ejaculation disorders.

Of the 71 patients who took medical treatment only 44 patients were satisfied with their therapy and 27 patients were not satisfied due to several reasons including age, comorbidities, diabetes and the patient's psycho-emotional state.

3. Analysis of the patient questionnaire:

a- Follow-up through regular check-ups: 97.8% of patients (87 patients) felt followed and considered, while 2.2% (2 patients) felt neglected or even abandoned.

b- **Frequency of spontaneous erections after radiotherapy:** 76.4% (68 patients) had spontaneous erections allowing sexual intercourse against 23.6% (21 patients) who had lost it.

c- **Development of sexual desire after radiotherapy**: it increased for 1.1% (1 patient), remained the same for 67.4% (60 patients) and decreased for 31.5% (28 patients).

d- **Frequency of sexual intercourse after radiotherapy**: it changed differently for the patients. 1.1% (1 patient) increased, 53.9% (48 patients) remained the same and 43.8% (39 patients) decreased.

e- **Frequency of orgasms before radiotherapy treatment**: 12.4% had orgasms with every intercourse (11 patients), others 67.4% not with every intercourse (60 patients) and 20.2% had none (18 patients).

f- **Frequency of orgasms after radiotherapy treatment:** 41.6% lost it (37 patients), 11.2% retained it (10 patients) and 47.2% retained it but not at every intercourse (42 patients).

g- **Orgasm intensity after radiotherapy**: identical in 30.3% of patients (27 patients), less intense in 69.7% (62 patients) and none of the patients had a more intense orgasm

h**- Evaluation of urine loss during sexual intercourse**: 5.6% (5 patients) were so embarrassed that sexual intercourse was avoided, 68.5% (61 patients) were embarrassed but did not prevent sexual intercourse and 25.8% (23 patients) were not embarrassed and allowed the patients to have a normal life.

i**- Impact of lack of ejaculation on patients**: very bothersome to the point of avoiding sexual intercourse in 1.1% (1 patient), bothersome but does not prevent intercourse in 58.4% (52 patients), and not bothersome at all in 40.4% (36 patients).

j- **Satisfaction with the medical treatment**: 71 patients who received the treatment among them :

- 62% (44 patients) were satisfied with the treatment
- 38% (27 patients) were not satisfied

4. **Qualitative analysis: Study of the impact of radiotherapy on the frequency of sexual intercourse before and after treatment:**

	Beforetreatment	Aftertreatment	P
NO	**20.2**	**41.6**	**< 0.05**
YES	**12.4**	**11.2**	**NS (0.81)**
MORE OR LESS	**67.4**	**47.2**	**< 0.05**

Orgasm frequencies before and after radiotherapy

IV. DISCUSSION:

Testosterone is a male hormone that determines male sexual characteristics, sexual drive and erection. This hormone is produced by the testicles and to a lesser degree by the adrenals. The erection is the result of the presence of testosterone and stimulation of the brain [4].

Orgasm is the climax of sexual pleasure in both men and women. In men it is associated with ejaculation [4].

It is perfectly possible to have an orgasm without emitting sperm, which is the case for young people before puberty or for some men who have had prostate surgery (retrograde ejaculation) [5].

Testosterone levels at the initial work-up have an important prognostic value for the subsequent assessment of sexual function and its evolution. A persistent decrease in sexual desire should be investigated for a testosterone deficiency syndrome. In the case of a proven biological deficiency and clinical signs, the recommendations of the learned societies involved allow the consideration of replacement therapy under certain conditions [14].

Evaluation of testosterone levels after 24 months since cessation of treatment also allows assessment of sexuality and identification of sexual disorders. For some patients, disorders appear very quickly during irradiation and their prevalence increases during the first three years.

Only 25% of men with normal erectile function before radiation therapy have a chance of maintaining it 5 years later. Erectile dysfunction stabilises thereafter, affecting 50% of patients in series with radiotherapy alone, and more than 70% when temporary hormone therapy is combined [5,12]. In the latter case, desire disorders are added to the dyserection and dysorgasmia and are not always regressive when hormone therapy is stopped [13,15].

Indeed, the variations in mean testosterone values are highly significant at each control $p < 0.05$. A gradual decrease in the average testosterone values is noted from the 3 month control, then 6 months, 9 months, 12 months, 18 months and 24 months post radiotherapy and this value decreases in favour of the therapeutic response and the favourable evolution of the patients' states but in the cases of too low values this influences unfavourably the sexuality of the patients because the higher the dose of irradiation the more the damage is important. Radiotherapy can have a deleterious effect on the exocrine (azoospermia) and endocrine (hypogonadism) functions of the testicles. The radiation-induced lesions on the testicles are dose-dependent (disturbance of testosterone, elevation of FSH, alteration of spermatic characteristics), in intensity and duration [10].

According to our study; The frequency of sexual intercourse as a function of testosterone in post radiotherapy is very different with a significant significance $p = 0.008$. The frequency of sexual intercourse therefore varies according to the treatment and also varies according to the testosterone value. In total of the 89 patients 53.9% (48 patients) had maintained normal sexual frequency, 44.9% (40 patients) had decreased sexual frequency and only 1.1% (1 patient) had increased frequency which is probably related to age. Age and diabetes are the main risk factors. Age is a very important parameter in the modification of the frequency of sexual intercourse after radiotherapy, with a very significant difference $p < 10^{-3}$. The older the patient, the more frequent intercourse is reduced. The existence of nocturnal erections before radiotherapy is a good prognostic factor [5, 15] as is younger age.

The intensity of sexual intercourse also varied significantly with age with a highly significant difference $p < 10^{-3}$. Of a total of 89 patients, 69.7% had a decreased sexual intensity, 30.3% had the same sexual intensity as before treatment. All of our results are consistent with the literature and other studies, as the younger the age of the patients, the better the retention of sexual intensity.

After prostatic radiotherapy, hypogonadism and testicular atrophy have been reported 3 to 8 years after irradiation [11]. Testicular irradiation can also lead to alterations in sperm genetic material, especially during the first year [16]. Medically assisted reproduction using epididymal aspiration or testicular extraction after radiotherapy may be compromised or at risk of fetal malformation.

The behaviour of the patients in relation to the absence of ejaculation varies strongly according to their age and this in a significant way $p < 10^{-3}$, on the 89 patients we have 58.4% or the absence of ejaculation is annoying but does not prevent a more or less normal sexuality

Concerns about sexual deficiency are at the forefront of distress for a large majority of patients [17], and 68% of them are even willing to sacrifice part of their 5-year survival chances in exchange for maintaining their sexual function [13]. The behaviour of patients in relation to the absence of ejaculation varies significantly with their age ($p < 10^{-3}$). Of the 89 patients, 58.4% have an absence of ejaculation that is bothersome but does not prevent a more or less normal sexuality, 40.4% have an absence of ejaculation that does not cause any discomfort, and only 1.1% have an absence of ejaculation that is very bothersome and poses a major problem. The younger the age of the patients, the less problematic the absence is, although they still lead a normal life. But the older the patient is, 65 years, the more embarrassing it is and the more it causes a big problem of identification and relationship in these patients, this is what all the studies show. In fact, ejaculation disorders have little or no repercussions on patients, but the older they get, the more problematic it becomes ($p = 0.008$).

The questionnaire sent to the patients in order to analyse their sexuality and its variations according to the variations in testosteronemia before and after treatment. The analysis of the testosteronemia averages at each control where the variation is very significant $p < 10^{-3}$. The kinetic parameters of testosterone evolution are decisive prognostic criteria for the assessment of the sexuality of the patients and the identification of future sexual disorders in particular.

Before radiotherapy the patients had orgasms in different ways, some 12.4% had orgasms with every sexual intercourse, others 67.4% did not have orgasms with every sexual intercourse and finally 20.2% had no orgasms.

Since the end of radiotherapy, the patients' orgasms have changed: 41.6% have lost their orgasms, 11.2% have retained their orgasms and 47.2% have retained their orgasms but not with every act of intercourse. Similarly, the intensity of orgasms remained the same in 30.3% of patients, less intense in 69.7% and none of the patients had a more intense orgasm.

The comparison of the frequency of orgasms before and after radiotherapy treatment has a very important significance:

- Those who lost it the difference is highly significant with $p < 10^{-3}$
- Those who kept it without modification the difference is not significant
- Those who kept orgasms more or less regularly the difference is very significant with $p < 10^{-3}$

Comparing our results (erectile dysfunction, orgasm and sexual function), all these results are consistent with the different studies [13].

Of the 71 patients who took medical treatment only 44 patients were satisfied with their therapies and 27 patients were not satisfied due to several reasons including age, comorbidities, diabetes and the patient's psycho-emotional state.

In case of failure of iPDE5, intra-cavernous injections, vacuum or implants can be proposed [18].

V. CONCLUSION:

Protocols for the management of sexual difficulties related to prostate cancer vary according to the type of carcinological treatment chosen. Their early implementation ensures the best chances of recovery. The evaluation of sexuality prior to the diagnosis of prostate cancer and its various parameters is essential. It enables the information to be personalised and early therapeutic solutions to be envisaged, adapted to the patient's needs. It also allows other risk factors that may affectfuture sexuality to be taken into consideration.
The reconstruction of sexual function is possible and contributes greatly to the improvement of the patient's emotional state. The emotional and relational impact of prostate cancer is significant and should not be overlooked. The risk of anxiety and depressive disorders is high, and concerns about future sexuality are at the forefront of emotional disturbance and distress.

Erection is not the only sexual parameter profoundly affected by prostate cancer. Problems with orgasm, ejaculation, libido, continence and infertility all contribute to the degradation of self-image and the feeling of loss of masculine identity. Reviving the erection is not enough, masculinity itself must be redefined and rebuilt.

It is important not to hesitate to offer the patient temporary forms of alternative sexuality, allowing the couple to maintain carnal and emotional intimacy, while waiting for the erection to become possible again. Pharmacological treatments are the key element of erectile rehabilitation, which is essential to restore sexual function.

Conflicts of interest: the authors declare no conflict of interest

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