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Evaluation of Health Outcomes in Iraqi Patients With Prostate Cancer Who Underwent Radiotherapy

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Abstract: Prostate cancer is common globally, with great strain on patient-reported health-related quality of life (HRQoL). This study aimed to assess general health quality of life in prostate cancer patients after radiotherapy treatment. A study was conducted on 80 prostate cancer patients who underwent radiotherapy at different hospitals in Karbala, Iraq, during a one-year follow-up period between February 2023 and February 2024. Demographic and surgical data were recorded for prostate cancer patients during the follow-up period. This study assessed patients' quality of life after completing radiotherapy, with all patients completing this quality of life questionnaire—a total of patients with prostate cancer (80) data enrolled in our study. The most symptoms were correlated with PC severity, include Urinary difficulties (85%) and fatigue (77.5%). Post RT procedure, short-term complications were 32.5%, where urinary incontinence with 11.25% and erectile dysfunction with 16.25%, while long-term complications were 40%, where included persistent erectile dysfunction got 25%. In the assessment of the quality of life, we found improving in physical functioning with 81.1 ± 6.6, diarrhea with 74.6 ± 12.5, and pain with 83.3 ± 6.2, while impaired in sexual functioning with 56.5 ± 4.8. This study demonstrates that patients with prostate cancer undergoing radiotherapy experience enhanced general well-being and improved quality of life. However, concurrent findings indicate a decline in sexual function.

Keywords: Prostate cancer (PC); Symptoms; Radiotherapy Treatment; Complications; and General Health Quality of Life (EORTC QLQ-C30) Questionnaire.

Introduction

Prostate cancer (PC) is a prevalent disease worldwide. It estimated incidence of 44 new cases per 100,000 inhabitants in the USA [1,2]. The risk of developing this tumor increases with age; more than 60% of all cases of CP are diagnosed in individuals over 65 years of age, with almost all of them observed after the age of 50 [3,4,5]. The diagnosis of this neoplasm can be made under clinical suspicion by compatible symptoms or by prostate screening with prostate-specific antigen (PSA). [6]

The natural history of CP comprises three stages: localized CP (limited to the gland), locally advanced CP (the tumor crosses the prostate capsule and spreads to the seminal vesicles and periprostatic tissues), and disseminated CP (the tumor spreads to the pelvic lymph nodes and/or produces distant metastases, mainly bone) [7,8,9,10]. For its clinical staging, the TNM classification (tumor - lymph node - metastasis) was prepared by the American Joint Committee on Cancer (AJCC) and the histological classification according to the Gleason scale [11,12,13]. The risk of recurrence is established through the tumor stage, the Gleason scale score, and the PSA value. [14]

Current treatment modalities for CP include controlled or expectant observation, surgery (radical prostatectomy), radiation therapy (external radiation and brachytherapy), and hormone blockade [15]. The selection of these will depend on the tumor stage, risk of recurrence, life expectancy, and patient preferences [16]. In this decision, it should be considered that most tumors have a slow progression, most patients dying from causes not related to the tumor, and that the treatments have significant associated morbidity. [17]

The most frequently used technique in non-metastatic patients is Three-Dimensional Conformal Radiation Therapy (3D-CTR) [18]. This therapy is associated with adverse events that are usually localized in the urinary tract (irritative and obstructive symptoms, incontinence, hematuria, urethritis, urethral tightness, etc.), digestive (diarrhea, proctitis, etc.) and genital (impotence). [19]

Patients and Methods

Study Design

We conducted a cross-sectional study on 80 patients with prostate cancer, all of whom underwent radiotherapy at different hospitals in Karbala, Iraq, between February 2023 and February 2024. Demographic and diagnostic data were recorded for prostate cancer parameters. Demographic data included age (50 – 78 years), body mass index (BMI), comorbidities, smoking, alcohol consumption, marital status, educational status, and employment.

Furthermore, all patients aged 50 – 78 years underwent transrectal ultrasound (TRUS). The prostate cancer stage (stage I, II, III, IV), clinical status, tumor size (>0.5 cc, <0.5 cc), the percentage of patients who had undergone previous abdominal surgery, pelvic radiotherapy, family history of prostate cancer, hormonal therapy, prescribed dose (Gy), and daily dose (Gy/fraction) were determined. The most common symptoms of prostate cancer in patients were defined as frequent urination, difficulty urinating, blood in urine or semen, painful ejaculation, bone pain, erectile dysfunction, fatigue, and urgency.

Inclusion and Extraction Criteria

The following criteria were included:

1. Patients aged 50 – 78 years.
2. Patients who had undergone radiation therapy.
3. Patients who were obese and smokers.
4. Patients who had undergone previous abdominal surgery.

The following criteria were excluded:

1. Patients younger than 50 years.
2. Patients who had undergone other treatment modalities.
3. Patients with serious illnesses.
4. Patients who had osteoporosis or fractures.

Interventions

Prostate cancer patients treated with standard ADT (gonadotropin-releasing hormone agonist± bicalutamide) have included everything else. After ADT was given in attendance with radiotherapy, it continued on. The local external beam radiotherapy was used according to either of the two following schedules: a conventional regimen of 70 Gy in 35 daily fractions of 2 Gy over 7 weeks or a hypo-fractionated regimen of 55 Gy in 20 daily fractions of 2.75 Gy over 4 weeks. Patients were simulated in the supine position, with an empty rectum and comfortably full bladder. Pelvic immobilization was performed using knee support. Planning CT scans were acquired without the use of intravenous contrast. Three-dimensional forward planning was used that conformed to the target volume using a

10-mm circumferential margin around the prostate except posteriorly (6 mm) and 2 cm of proximal seminal vesicles. Patients were followed up weekly during radiotherapy, then 1 month after finishing radiotherapy, then every 3 months for 1 year.

Questionnaires

At an early stage, prostate cancer is often asymptomatic or may present with isolated symptoms, thus hindering early detection. However, as symptoms progress, men may experience urinary difficulties; blood may be found in urine or semen, or there may be painful ejaculation. The significance of prostate cancer is generally assessed by the Gleason grading system, which puts into account the patterns of histology that designate the aggressiveness of cancer. This system is graded from 2 to 10 on a scale of well suggested and hence less aggressive to poor differentiation and hence aggressive.

PSA or Prostate-Specific Antigen is a protein that the prostate gland generates since it has some connection with the maintenance of the fluidity of semen necessary for the movement of sperm. PSA is used for assessing the diagnosis and management of disorders of the prostate, although it is chiefly directed toward prostate cancer alone. The PSA scale scores from low to high, where its levels are categorized for clinical interpretation (Normal PSA, < 4 ng/mL), (Borderline PSA, 4-10 ng/mL), (Elevated PSA, > 10 ng/mL), (Very High PSA, > 20 ng/mL).

EORTC QLQ-C30 is an instrument that is widely used with cancer patients and measures health-related quality of life. It addresses the functional status, symptoms, and overall health of patients. The measure includes 30 items that can be scored on a 0-100 scale, with higher scores implying better health perception.

Results

Table 1: Distribution of demographic characteristics of prostate cancer patients.

CATEGORIES	PARAMETERS	FREQUENCY {N = 80}	%
AGE, YEARS			
	50 – 59	28	35%
	60 – 69	36	45%
	≥ 70	16	20%
BMI, KG/M2			
	Overweight	28	35%
	Obesity	52	65%
COMORBIDITIES			
	Hypertension	52	65%
	Diabetes	16	20%
	Cardiovascular disease	24	30%
	Hypercholesterolemia	40	50%
	Urological disease	12	15%
SMOKING STATUS			
	Smokers	24	30%
	Non – smokers	56	70%
ALCOHOL USE			
	Present	14	17.5%
	Absent	66	82.5%
MARITAL STATUS			
	Single	19	23.75%
	Married	47	58.75%
	Divorced	14	17.5%
EDUCATION STATUS			
	Primary school	13	16.25%

	Secondary school	24	30%
	Post-graduate/ university	43	53.75%
EMPLOYMENT STATUS			
	Worked	52	65%
	Retired	28	35%

Table 2: Diagnostics outcomes of prostate cancer.

Items	Parameters	Frequency {n = 80}	Percentage, %
Gleason score (GS)			
	≤7	27	33.75%
	8–10	53	66.25%
Antibiotics used			
	Anticoagulants	8	10%
	Anti – depressive	4	5%
	None	68	85%
T stage			
	T1	8	10%
	T2	48	60%
	T3-4	20	25%
	> 4	4	5%
PSA levels			
	Normal PSA, < 4 ng/mL	3	3.75%
	Borderline PSA, 4–10 ng/mL	19	23.75%
	Elevated PSA, > 10 ng/mL	50	62.5%
	Very High PSA, > 20 ng/mL	8	10%
Lymph node staging			
	Nx	68	85%
	N0	8	10%
	N1	4	5%
Tumor size			
	> 0.5 cubic centimeters	75	93.75%
	< 0.5 cubic centimeters	5	6.25%
Previous abdominal surgery			
	Yes	20	25%
	No	60	75%
Pelvic irradiation			
	Yes	35	43.75%
	No	45	56.25%
Family history of PC			
	Present	51	63.75%
	Absent	29	36.25%
Hormone therapy			
	Before	19	23.75%
	During	22	27.5%
	After	39	48.75%
Prescribed dose (Gy)			
	HYPO	49	61.25%
	CONV	31	38.75%
Daily dose (Gy/fr)			
	HYPO	2.52 {2.0 – 3.3}	

	CONV	2.1 {1.24 – 2.2}

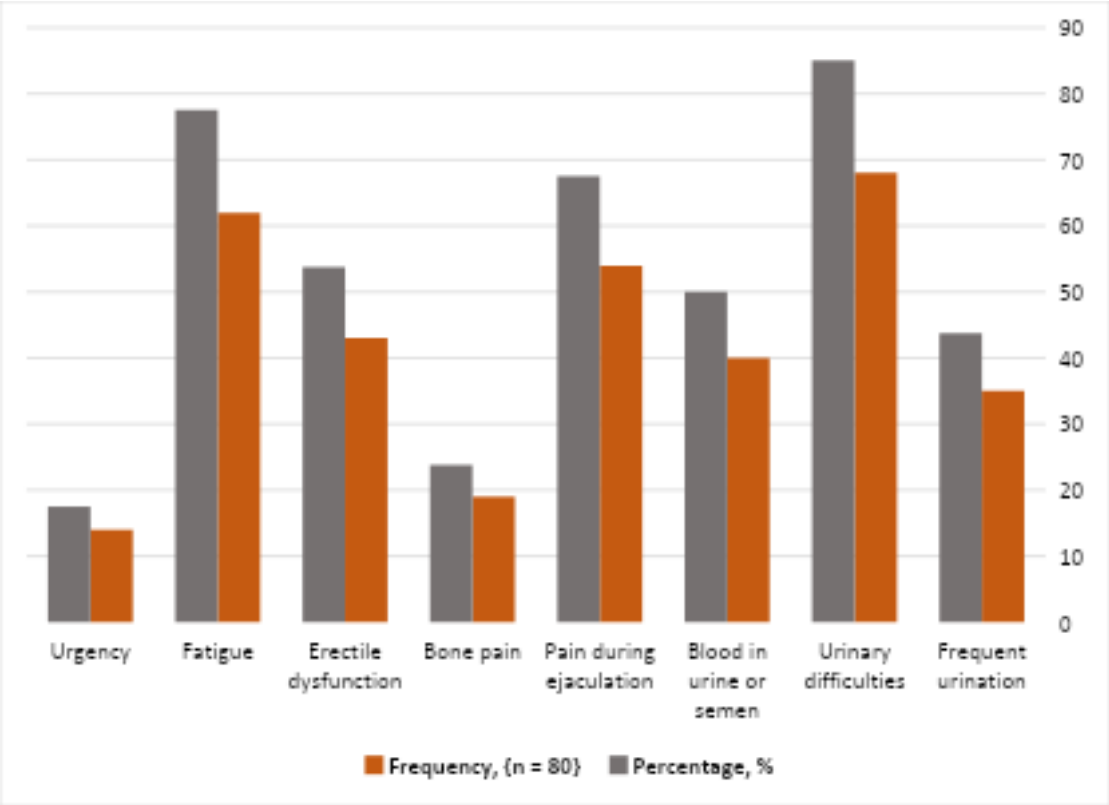

Figure 1: Frequency distribution of prostate cancer (PC) on patients.

Table 3: Postoperative complications.

Complications	Items	Frequency, {n = 80}	Percentage, %
Short-Term Complications		26	32.5%
	Urinary incontinence	9	11.25%
	Erectile dysfunction	13	16.25%
	Infection or bleeding	2	2.5%
	Blood clots	2	2.5%
Long-Term Complications		32	40%
	Chronic urinary incontinence	6	7.5%
	Persistent erectile dysfunction	20	25%
	Narrowing of the urethra	3	3.75%
	Fluid accumulation	3	3.75%

Table 4: General health related to Quality of life questionnaire in patients within pre-operative and post-operative using EORTC QLQ-C30.

ITEMS	EORTC QLQ-C30
CONSTIPATION	72.14 ± 5.3
DYSPNEA	54.5 ± 8.4
FATIGUE	58.2 ± 6.6
EMOTIONAL FUNCTIONING	63.1 ± 9.7
DIARRHOEA	74.6 ± 12.5
INSOMNIA	67.3 ± 8.7
NAUSEA AND VOMITING	78.4 ± 8.5
COGNITIVE FUNCTIONING	78.9 ± 4.3

SEXUAL FUNCTION	56.5 ± 4.8
PHYSICAL FUNCTIONING	81.1 ± 6.6
APPETITE LOSS	75.5 ± 4.4
PAIN	83.3 ± 6.2
SOCIAL FUNCTIONING	81.8 ± 5.8
ROLE FUNCTIONING	72.2 ± 7.6
GLOBAL HEALTH STATUS	78.8 ± 4.9

Discussion

It was an evaluation of the health-related quality of life (HRQoL) by the patient-reported quality of life using the validated questionnaire, that is, EORTCQLQ-C30. Furthermore, the possible impact of clinical, technical, and dosimetric data on the quality of life was investigated, focusing on the timing corresponding to when treatment level evidence has a significant impact on quality of life.

The very good results of this study said that out of the 14 QoL dimensions, 12 dimensions got completion restoration within the 12 months at RT end, all of which were narrowly completed, with sexual functioning being additionally worse than the two domains at follow-up. Some parts of QoL after 6 months can be owing to favorable nutrition status and perhaps an inner peace of mind associated with diminished anxiety because it suddenly comes in the form of the alleviation of symptoms when, during, and after treatment; tolerability is good with treatment. The other point is that, in most cases, these symptoms will go away in a short span of time. [20]

Specifically, a 4-point improvement was seen in global health, appetite loss, and pain, which were assessed at the end of radiotherapy. This finding contradicts previous reports [21,22,23] describing lower HRQoL and functional status following radiotherapy. Other studies, however, noted no significant changes in daily activities during treatment.

Irradiation mainly affected fatigue and diarrhea, respectively, at the end of the course of radiotherapy. Hormonal therapy, travel to the institute where the patient was treated with radiotherapy, and the treatment itself all were more likely causes of fatigue during the course of treatment, whereas diarrhea is the most common radiation complication associated with pelvic radiotherapy. Fatigue is a very commonly reported side effect for men receiving radiotherapy to treat prostate cancer. [24]

The decrease in sexual functioning may have links with an increasing age of the patients from baseline to the 12-month follow-up. [25,26,27] Some studies have reported that physical functioning decreases at 1 year following RT, while the cognitive function remained mostly unaffected after radiotherapy. [28,29] Other studies show a moderate yet transient deteriorative impact on QoL right after radiotherapy.

Conclusion

Following 12 months of follow-up, prostate radiotherapy significantly improved urinary functioning in patients with metastatic prostate cancer while preserving bowel functioning but had an adverse impact on sexual functioning. Prostate cancer-specific mortality after radiotherapy treatment was low.

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