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Hospital burden of long-term genitourinary and gastrointestinal toxicity after radical radiotherapy for prostate cancer☆

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ABSTRACT

Introduction: Treatment options for prostate cancer (PCa) include radical radiotherapy (RT) and radical prostatectomy, both of which have comparable oncological outcomes. The aim of this study was to investigate the hospital burden of long-term genitourinary and gastrointestinal toxicity among patients with PCa who were treated with radiotherapy at our institution.

Methods: The radiotherapy department database was used retrospectively to identify all patients who underwent radiotherapy for PCa from January 2006 to January 2008. The patient administration system from each public hospital in the region was interrogated and all patient points of contact were recorded. Minimum follow up was 5 years. Individual patient charts were reviewed and factors that might influence outcomes were documented.

Results: We identified 112 patients. The mean age at diagnosis was 66 (44–76) and the median PSA was 12.1 (3.2–38). The mean duration of follow-up was 7.8 yrs. Twenty-three patients (20%) presented to the Emergency Department (ED) with late onset toxicity. Nine patients had more than 2 ED attendances. Twenty-five patients (22%) were investigated for genitourinary toxicity. Forty-seven patients (42%) underwent investigation for gastrointestinal side-effects and 45% of these required argon therapy (21/47).

Conclusion: We found a significant hospital burden related to the management of gastrointestinal and genitourinary toxicity post radical radiotherapy for prostate cancer. As health care reforms gain momentum, policy makers must take into account the considerable longitudinal health care cost related to radiotherapy. It is also important that patients are counselled carefully in relation to potential long-term side-effects.

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Introduction

The incidence of prostate cancer has trebled over the past decade and now represents 31% of new cancer diagnoses in Ireland.[1] There are 3219 males diagnosed with prostate cancer in Ireland each year and 46,690 in the UK.[1,2] Many of these men will pursue a radical course of treatment for their malignancy. External beam radiotherapy and radical prostatectomy are two common treatment options in the management of high volume localised disease. Currently there is no Level I evidence to suggest either treatment offers superior oncological outcomes. Therefore best practice is that patients will meet with both a radiation oncologist and urologist to discuss individual treatment preferences.3 In the absence of a superior treatment, patient decision is usually influenced by local availability of treatment, duration of treatment and anticipated side effects.[4–7]

Potential long-term side effects from radiotherapy include radiation enteritis and radiation cystitis caused by inadvertent radiation to the bladder or bowel.[8,9] These may be graded using the ROTG/EORTC toxicity grading criteria as shown in Table 1.[10] A number of studies have also reported secondary malignancies following radiotherapy.[8,11–14] Although patients may experience short-lived bladder or bowel disturbance at the time of treatment, these troublesome symptoms can also present at a later interval following radiotherapy, due to late onset fibrosis and progressive endarteritis in the damaged tissue.[15] The incidence of toxicity following radiotherapy has been reported by a number of studies.[8,9] However the economic cost to the hospital in treating such complications is under-reported and therefore may be overlooked when comparing the financial implications of different treatment options. The aim of this study was to investigate the hospital burden of late onset gastrointestinal (GI) and genitourinary (GU) toxicity following radical radiotherapy for prostate cancer.

Methods

All patients who underwent IMRT (intensity modulated radiation therapy) for prostate cancer between January 2006 and January 2008 were identified from the radiotherapy department database. The average length of follow up was 7.8 years (7–8.9 years). The patient administration system for each of the four public hospitals in the Mid-Western region was interrogated and each patient point of contact within the region was recorded. A comprehensive review of individual charts and patient details was performed. This data was triangulated with the endoscopy, emergency department (ED), radiology and laboratory databases. Primary outcome measures recorded included: 1) number of ED attendances with GI and GU toxicity, 2) emergency admission rate, 3) interventions performed for investigation and treatment of GI or GU toxicity and 4) blood transfusion rate. Toxicity was graded using the ROTG/EORTC toxicity grading criteria (Table 1). Secondary outcomes included 1) biochemical recurrence rate according to Phoenix criteria (nadir PSA + >2 ng/ml),[16] 2) rate of metastasis, 3) all-cause mortality and 4) disease-specific mortality. Finally, a basic cost analysis was performed to estimate the financial burden of the treatment, investigation, and management of long-term GI and GU toxicity within this group of patients. The results were collated on a secure protected database (Microsoft Excel, WA, USA) and analysed using SPSS (IBM, NY, USA).

Results

A total of 112 patients underwent IMRT for localised prostate cancer between January 2006 and January 2008. Baseline demographics are shown in Table 2. IMRT was delivered at a standard dose of 37 fractions of 74Gy. All patients had adjuvant therapy with LHRH analogue injections (49 patients–1 year, 63 patients–3 years).

Emergency hospital burden

Twenty-three (20%) of the one hundred and twelve patients presented to the Emergency Department (ED) with GI or GU toxicity within the 9 year follow up period. Eleven (10%) patients presented with visible haematuria (8 grade 3 and 3 grade 4 toxicity.[10] Fifteen patients presented with bleeding per rectum (all grade 2 toxicity).[10] Nine patients had more than one ED presentation (40%, 9/23). Three patients presented (on separate occasions) with symptoms of GI and GU toxicity. Of the 36 presentations to ED, 10 required admission for treatment of toxicity. Outpatient investigation and follow up was arranged for the remainder of presentations. The cumulative

Table 1 – RTOG/EORTC late radiation morbidity scoring scheme.

Toxicity grade	Bladder	Bowel
Grade 0	None	None
Grade 1	Slight epithelial atrophy; Minor telangiectasia (microscopic haematuria)	Mild diarrhoea; Mild cramping; Bowel movement 5 times daily Slight rectal discharge or bleeding
Grade 2	Moderate frequency; Generalized telangiectasia; Intermittent macroscopic haematuria	Moderate diarrhoea and colic; Bowel movement >5 times daily; Excessive rectal mucus or intermittent bleeding
Grade 3	Severe frequency & dysuria Severe generalized Telangiectasia (often with petechiae); Frequent haematuria; Reduction in bladder capacity (<150 cc)	Obstruction or bleeding, requiring surgery
Grade 4	Necrosis/Contracted bladder (capacity <100 cc); Severe haemorrhagic cystitis	Necrosis/Perforation Fistula
Grade 5	Death directly related to radiation effects	Death directly related to radiation effects

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