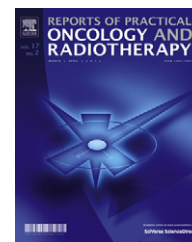


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Technical note

Lower urinary tract infections from external beam radiation therapy in prostate cancer: A single institution experience

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ABSTRACT

External beam radiation therapy (EMRT) is effective for the treatment of localized prostate cancer. Lower urinary tract infections (LUTIs) are considered one of the main possible adverse events related to External beam radiation therapy. Here we analyzed the incidence of LUTI during EMRT. Urinary tract infection was assumed when the findings of bacteriuria exceeded 100,000 units/mL, accompanied by specific cystitis symptoms. Among the total 540 analyzed patient, 208 (38.5%) developed a LUTI. *E. coli* was the main microorganism involved in LUTIs (102, 49.04%) with 8 cases of a combination between *E. coli* and another germ. In conclusion, a risk of urinary infections in cancer patients treated with pelvic radiotherapy was observed, in order to reduce the use of antibiotic resistance, preventive treatment with non-antibiotic agents 5 are warranted.

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External beam radiation therapy (EBRT) is effective for the treatment of localized prostate cancer.¹ In a randomized trial, radical prostatectomy and EBRT achieved comparable disease control after a 10-year follow-up.² Lower urinary tract infections (LUTIs) are considered one of the main possible adverse events during EBRT for localized prostate cancer.³ It was estimated that about 40% of patients developed a LUTI during EBRT.³ To better define the incidence of LUTI during EMRT,

in our institution we proposed to all patients a protocol that envisaged two urine cultures after 3 and 6 weeks and, if clinically indicated, from the start of EBRT treatment. Urinary tract infection was assumed when the findings of bacteriuria exceeded 100,000 units/mL, accompanied by specific cystitis symptoms. We included men treated with a radical radiotherapy for a total of 73.6 Gy delivered as 32 fractions of 2.3 Gy, an adjuvant post-surgical radiotherapy for a total of 66/69 Gy

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Table 1 – Frequency, type of urinary infection, and recurrence.

Microorganism	Number of events	Percentage (%)
<i>E. coli</i>	102	49.04
<i>Enterococcus faecalis</i>	46	22.12
<i>Proteus mirabilis</i>	10	4.81
<i>Enterobacter cloacae</i>	7	3.37
<i>Pseudomonas aeruginosa</i>	6	2.88
<i>Staph epidermidis</i>	6	2.88
<i>Streptococcus agalactiae</i>	6	2.88
Others	24	12.01
Recurrence	30	(14.2)

delivered as 32 fractions of 2.23/2.30 Gy and a “personalized” radiotherapy for a total of 45 Gy delivered as 15 fractions of 3 Gy. From 2006 to 2016 a total of 540 men with a diagnosis of prostatic adenocarcinoma were treated with radiotherapy to the prostatic area and the pelvis. Among the total 540 analyzed patients, 208 (38.5%) developed a LUTI. Among these patients, 136 (65.38%) underwent adjuvant radiotherapy after radical prostatectomy while 72 (34.62%) were treated with a radical radiotherapy. Hypofractionation radiotherapy was performed in 70 (34.3%) of the 208 patients who developed LUTI. Interestingly, only 16 (7.69%) patients reported intense dysuria, however 164 (78.85%) had pollakiuria and 36 (17.31%) suffered from diabetes. Finally, 122 (58.65%) men used non-steroidal anti-inflammatory drugs (NSAIDs) to reduce urinary symptoms.

E. coli was the main microorganism involved in LUTIs (102, 49.04%) with 8 cases of a combination between *E. coli* and another germ. A complete list of all microorganisms involved was reported in Table 1. A total of 30 (14.2%) cases of recurrences (mainly from *E. coli*) was observed.

In conclusion, a risk of urinary infections in cancer patients treated with pelvic radiotherapy was observed with

an incidence ranging from 14% to 33%, depending on the type of cancer and radiation techniques.⁴

In order to reduce the use of antibiotic resistance, preventive treatment with non-antibiotic agents⁵ are warranted to reduce the incidence of LUTI, its symptoms, the antibiotic and the NSAIDs use.

Conflict of interest

None declared.

Financial disclosure

None declared.

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