

SYSTEMATIC REVIEW AND META-ANALYSIS OF RADIATION THERAPY FOR HIGH-RISK NON-MUSCLE INVASIVE BLADDER CANCER

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Introduction and Objective

- Radiation therapy (XRT) has been investigated as a possible treatment for high-risk non-muscle invasive bladder cancer (NMIBC) with the goal of bladder preservation, especially with the ongoing Bacillus Calmette-Guerin (BCG) shortage.
- Yet, little is known about the clinical efficacy and the quality of evidence supporting XRT for NMIBC. Herein, we performed a systematic review and meta-analysis to evaluate XRT in the treatment of patients with high-risk NMIBC

Methods

5V-RES

- Cochrane Central Register of Controlled Trials, EMBASE, MEDLINE, and Web of Science were searched for high-risk NMIBC (high grade T1, T1/Ta with associated risk features: CIS, multifocality, > 5cm in diameter) treated with primary XRT.
- Outcomes evaluated were recurrence-free survival (RFS), cancer-specific-survival (CSS), overall survival (OS), and salvage cystectomy and progression to metastatic disease rates. A metaanalysis was performed to assess outcomes for XRT in NMIBC

Results highlights

- 13 studies including 746 patients met the search criteria.
- The 5-year rates of RFS, CSS and OS were 54% (95% CI = 38% 70%), 86% (95% CI = 80% 92%), and 72% (95% CI = 64% 79%), respectively.
- 13% of patients proceeded to salvage radical cystectomy.
- 9% developed metastatic disease.
- All studies were of poor quality, comprising single institution and retrospective studies with only one clinical trial.

Conclusions

- XRT for high-risk NMIBC provides some degree of oncologic control, although distant progression was noted.
- In the setting of the low-quality evidence, a prospective clinical trial is needed to clearly define the risks and benefits of this approach.

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Study		Weight	Proportion 95% CI	
Merten et al RT group 2019		12 88%	0 14 [-0 00 0 28]	Stu
Harland et al. 2007	⊢ ∎-1	13.80%	0.31 [0.22, 0.40]	Po
Merten et al RCT group 2019	⊢∎⊣	13.68%	0.46 [0.36, 0.56]	Va
Quilty et al. 1986	⊢ ∎1	12.27%	0.56 [0.39, 0.73]	
Van der Steen-Banasik et al. 2002		10.59%	0.64 [0.39, 0.89]	₩€
Bell et al. 1999	⊢	11.48%	0.67 [0.46, 0.88]	Va
Merten et al RCTHT group 2019	⊢∎→	13.09%	0.70 [0.57, 0.83]	Inc
Inoue et al. 2008	⊢ ∎1	12.22%	0.90 [0.72, 1.08]	
RE Model	-	100.00%	0.54 [0.38, 0.70]	RE
Heterogeneity: I² = 82.6, τ²= 0.57, p< 0.01	2 0.2 0.6 1			Hete

Results: forest plot

5y-CSS			
Study		Weight	Proportion 95%Cl
Pos et al. 2005	—	8.39%	0.75 [0.54, 0.96]
Van der Steen-Ba	nasik et al. 2002 🛛 🛏 📲	8.12%	0.80 [0.59, 1.01]
Weiss et al. 2006	⊨∎⊣	45.48%	0.82 [0.76, 0.88]
Van Onna et al. 20	•••••	15.39%	0.92 [0.78, 1.07]
Inoue et al. 2008	⊢ − ■ −−1	22.62%	0.96 [0.85, 1.07]
RE Model Heterogeneity: Ι² = 22.6, τ² < 0	201, p = 0.16	100.00%	0.86 [0.80, 0.92]
	0.5 0.7 0.9 1 1.1		



Study		Weight	Proportion 95% CI
Harland et al. 2007	⊢-∎1	9.77%	0.52 [0.43, 0.62]
Quilty et al. 1986	⊧ ∎ 1	7.31%	0.53 [0.36, 0.71]
Jahnson et al. 1991	⊢∎ i	9.02%	0.57 [0.45, 0.69]
Merten et al. RT group 2019	⊢	6.45%	0.59 [0.38, 0.80]
Weiss et al. 2006	⊢∎⊣	10.38%	0.71 [0.64, 0.78]
Van der Steen-Banasik et al. 2	002	5.89%	0.75 [0.52, 0.98]
Pos et al. 2005	↓	6.44%	0.75 [0.54, 0.96]
Merten et al. RCT group 2019	⊢∎→	10.10%	0.75 [0.66, 0.84]
Jenkins et al. 1989	⊢⊞ (9.18%	0.75 [0.64, 0.87]
Bell et al. 1999	⊢	7.66%	0.84 [0.68, 1.01]
Inoue et al. 2008	⊢	7.26%	0.90 [0.72, 1.08]
Merten et al. RCTHT group 20	19 ⊢∎⊢	10.52%	0.94 [0.87, 1.01]
RE Model	*	100.00%	0.72 [0.64, 0.80]
Heterogeneity: I ² = 80.1, τ^2 = 0.01 p < 0.01			
	0.2 0.4 0.6 0.8 1 1.2		