Planned preoperative radiation therapy in muscle invasive bladder cancer: results of a meta-analysis

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Authors' objectives
To assess the effectiveness of pre-operative radiation followed by cystectomy versus cystectomy alone in patients with muscle invasive bladder cancer.

Searching
The authors searched MEDLARS and the electronic databases of Cancerlit, EMBASE, and Current Contents. The searches were limited to publications in English and covered the years 1970 to 1997. Search terms are not stated.

Study selection
Study designs of evaluations included in the review
Randomised controlled trials (RCTs) which reported data on the outcomes of interest and that enrolled 10 or more patients per study arm, with control arms consisting of patients undergoing cystectomy alone, and experimental arms employing radiation therapy prior to cystectomy.

Specific interventions included in the review
Radiotherapy (20, 45, and 32-54 Gy per dose) and cystectomy.

Participants included in the review
Patients undergoing surgery for muscle invasive bladder cancer who were aged 18 years or older.

Outcomes assessed in the review
Three- and five-year survival rates following surgery.

How were decisions on the relevance of primary studies made?
A physician investigator screened the initial citations.

Assessment of study quality
The authors do not state that they assessed quality.

Data extraction
Two research physicians (one of whom was an oncologist) extracted the data using a custom-designed data extraction form. Differences in data extraction forms were resolved in a consensus conference.

Methods of synthesis
How were the studies combined?
The studies were combined in a summary odds ratio (OR) with 95% confidence intervals (CIs) using a fixed-effect model according to procedures developed by Peto.

How were differences between studies investigated?
The Q-test for homogeneity was performed. Sensitivity analyses were also performed by including or excluding a trial in which the drop-out rate was approximately 5%.

Results of the review
Five RCTs met the inclusion criteria with 796 participants.

The studies were not statistically significantly heterogeneous.

The results for 3-year survival among patients treated with radiation therapy prior to surgery were not statistically significant compared to the control groups, OR 0.91 (95% CI: 0.64, 1.30). The results for 5-year survival among patients treated with radiation therapy prior to surgery were not statistically significant compared to the control groups, OR 0.71 (95% CI: 0.48, 1.06).

When the 5-year calculations omitted one of the studies which had a large drop-out rate, the results remained statistically insignificant OR 0.94 (95% CI: 0.57, 1.55).

**Authors' conclusions**
The authors state that there is insufficient evidence to support a role for the integration of radiation and cystectomy in the treatment of muscle invasive bladder cancer.

**CRD commentary**
The authors have clearly stated their review question and have made a good search of the literature. Inclusion and exclusion criteria are stated and data is reported on who selected the studies for inclusion and who extracted the data. The authors did not report any quality assessment of the included studies.

The statistical analysis is appropriate and the authors did test for homogeneity and performed sensitivity analyses to assess different treatment schedule effects on the results. Their conclusion that the use of radiation pre-operatively cannot be supported by the evidence appears to follow from the results.

**Implications of the review for practice and research**
Practice: The authors do not state any implications for practice.

Research: The authors state that further well-designed clinical trials of sufficient statistical power are needed to provide a more definitive answer to this research question.

**Bibliographic details**

**PubMedID**
9677446

**Indexing Status**
Subject indexing assigned by NLM

**MeSH**
Cystectomy; Humans; Muscle Neoplasms /secondary; Muscles /pathology; Neoplasm Invasiveness; Odds Ratio; Preoperative Care; Urinary Bladder Neoplasms /mortality /pathology /radiotherapy

**AccessionNumber**
11998003840

**Date bibliographic record published**
31/01/2000
Date abstract record published
31/01/2000

Record Status
This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.