

Appropriate Use and Value of Surveillance among Medicare Patients with Non-muscle-invasive Bladder Cancer

Author

Georgieva, Mihaela V.

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Abstract

Bladder cancer patients have the highest median age at diagnosis of 73 years compared with all other cancer types and often live with substantial disease and comorbidity burden. Due to high recurrence rates, intensive surveillance strategies, and expensive therapies, bladder cancer has the highest lifetime costs per patient from diagnosis to death. Regular surveillance cystoscopy is recommended for patients with non-muscle invasive bladder cancer (NMIBC) of all ages to detect potential recurrences, despite a lack of large randomized controlled trials examining how the use of cystoscopy affects patient outcomes.

The overall objectives of this dissertation were (1) to investigate factors associated with receipt of surveillance cystoscopy; (2) to characterize survival outcomes of NMIBC patients undergoing surveillance; and (3) to examine the cost-effectiveness of three different risk-stratified and uniform surveillance recommendations. We used the Surveillance Epidemiology and End Results (SEER)-Medicare data from 2000 to 2014 to assess disease characteristics and outcomes. We also developed a patient-level simulation model to quantify the health-economic impact of different frequencies of surveillance over five years. In Aim 1, we found that NMIBC patients aged ≥ 85 years, those with poor disability status, and those having ≥ 3 comorbidities at diagnosis were least likely to undergo recommended (≥ 7 cystoscopies) or low-intensity (≥ 4 cystoscopies) surveillance over the first two years post-diagnosis. As the age at diagnosis and the number of comorbid conditions increased, the odds of receiving recommended cystoscopy frequency as well as the rate of cystoscopy decreased. In Aim 2, older patients (≥ 75 vs. 66-74 years) and those with poor disability status at diagnosis had higher cumulative incidence of both bladder-cancer and other-cause death, regardless of frequency of cystoscopy. In Aim 3, low-intensity risk-stratified surveillance, with cystoscopy frequency increasing progressively with risk, was associated with different trade-offs such as lower costs and fewer false positive cases per patient, compared with a more frequent high-intensity risk-stratified approach and uniform surveillance.

This research highlights the importance of age, comorbidities, functional status, and risk-stratification on receipt of surveillance and outcomes of NMIBC patients. Additionally, findings from our study suggest intermediate-risk patients may benefit from less frequent surveillance than high-risk patients.

Advisor

[Wheeler, Stephanie B.](#)

Committee member

Dinan, Michaela A.; Nielsen, Matthew E.; Trogon, Justin G.; Weinberger, Morris

University/institution
The University of North Carolina at Chapel Hill

Department
Health Policy and Management

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United States -- North Carolina

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