

Treatment and Recurrence Patterns Among Bacillus Calmette-Guérin Experienced Patients With Recurrent, Papillary-Only High-Risk Non-Muscle Invasive Bladder Cancer

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Key Takeaway

BCG-experienced patients with recurrent, papillary-only HR-NMIBC have limited treatment options, with 61% experiencing subsequent recurrence within one year of starting treatment after initial recurrence, underscoring the need for more effective bladder-sparing treatment alternatives with durable response after BCG

Conclusions

In this real-world cohort of BCG-experienced, papillary-only Medicare beneficiaries with recurrent HR-NMIBC who received subsequent treatment, most received bladder-sparing options, predominantly intravesical chemotherapy

Despite this, more than half recurred within 12 months, highlighting an unmet need for more effective bladder-sparing treatments with durable response after BCG

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Disclosures

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Background

- High-risk non-muscle invasive bladder cancer (HR-NMIBC) is associated with a high disease burden and substantial likelihood of recurrence and progression, requiring close surveillance and management through multiple interventions^{1,2}
- Intravesical Bacillus Calmette-Guérin (BCG) has long been the bladder-sparing standard of care for HR-NMIBC; however, over two-thirds of patients experience recurrence following treatment³
- Patients who experience disease recurrence after treatment with BCG have few effective bladder-sparing treatment options and experience poor long-term clinical outcomes³⁻⁵
- Real-world data describing treatment and recurrence patterns among BCG-experienced patients with initially recurrent, papillary-only HR-NMIBC, remain limited

Objective

- To describe real-world treatment patterns and disease recurrence among BCG-experienced, papillary-only Medicare beneficiaries with recurrent HR-NMIBC in the US

Methods

Data source

- SEER-Medicare Data (01/01/2007–12/31/2022) were used, which linked the US National Cancer Institute's (NCI) Surveillance, Epidemiology, and End Results (SEER) cancer registry (containing cases diagnosed since 1973) with the Centers for Medicare & Medicaid Services (CMS) Medicare claims database
- Data were de-identified and complied with the Health Insurance Portability and Accountability Act (HIPAA) regulations

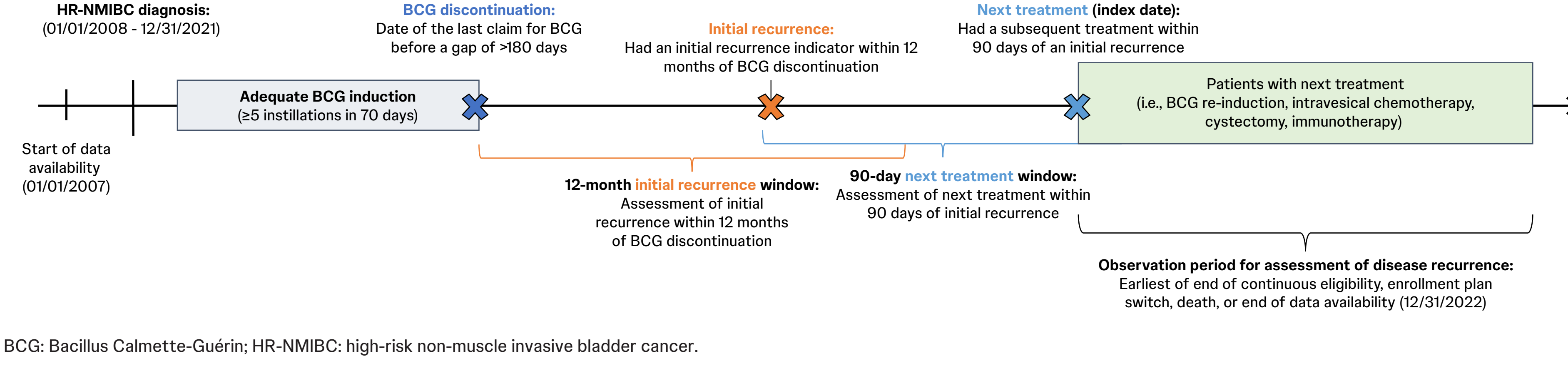
Study design and study population

- A retrospective longitudinal study was conducted (Figure 1)
- BCG-experienced patients aged ≥65 years with HR-NMIBC with papillary-only carcinoma (T1 or high-grade Ta, without carcinoma in situ), who experienced disease recurrence within 12 months of BCG discontinuation and initiated subsequent bladder cancer (BC)-related treatment within 90 days following recurrence (index date) were included (Figure 2)
 - BCG-experienced with recurrent disease was defined as the discontinuation of BCG treatment (based on a gap >180 days) following adequate induction (i.e., ≥5 instillations in 70 days), with an indicator of disease recurrence (i.e., evidence of transurethral resection of bladder tumor [TURBT], biopsy, intravesical or systemic chemotherapy, radiotherapy, radical cystectomy, pembrolizumab, or BCG re-induction) within 12 months after BCG discontinuation
 - Subsequent BC-related treatment observed within 90 days of a disease recurrence indicator included BCG re-induction, intravesical chemotherapy, cystectomy, or immunotherapy
- The baseline period was defined as the 12-month period of continuous enrollment prior to HR-NMIBC diagnosis, while the observation period spanned from the index date (i.e., initiation of BC-related treatment after initial recurrence) until the earliest of end of continuous enrollment, plan switch, death, or end of data availability (12/31/2022)

Study measures and statistical analysis

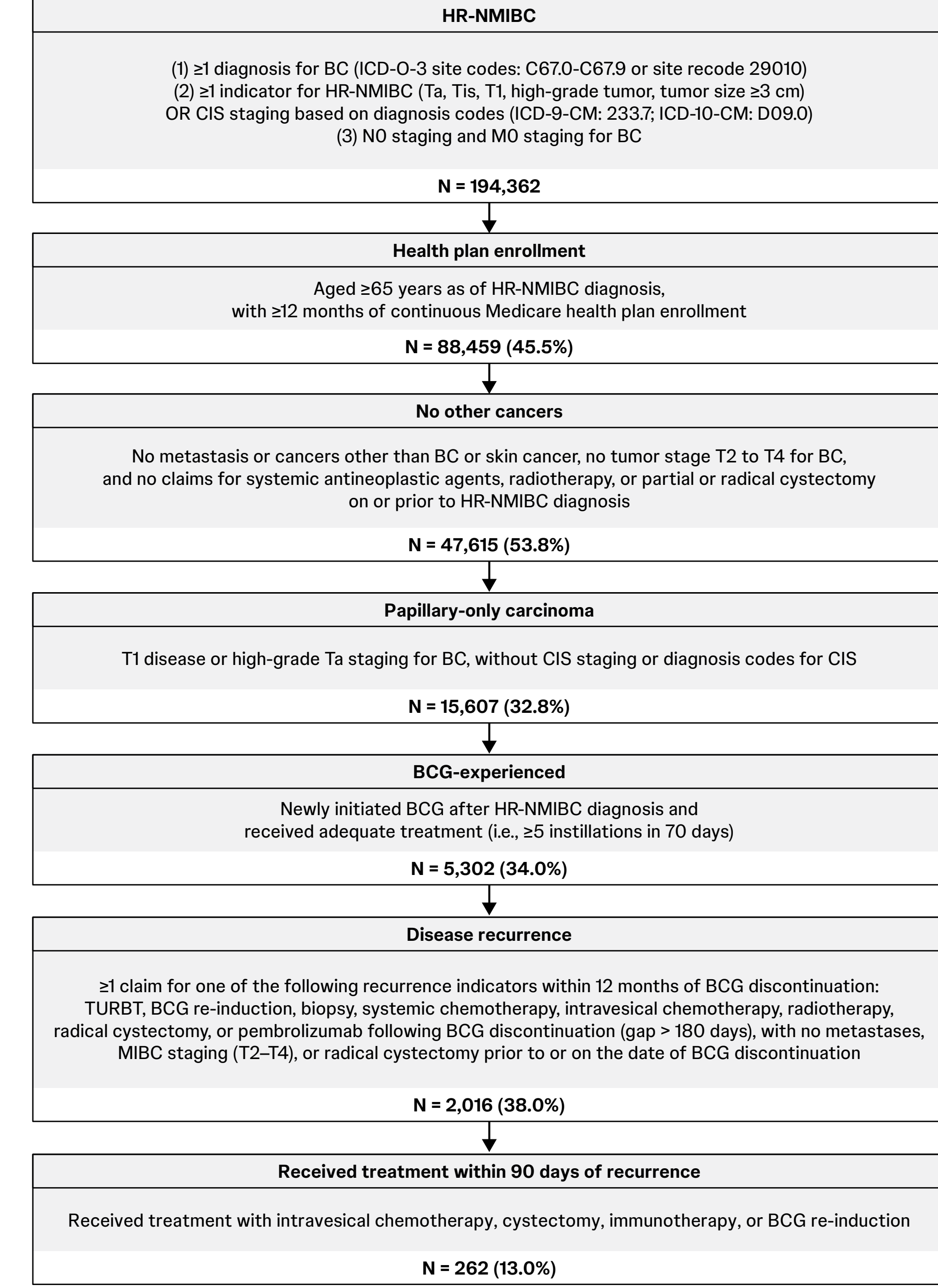
- Patient characteristics and treatment patterns were summarized using means, standard deviations, and medians for continuous variables, and frequencies and proportions for categorical variables
- Among patients who initiated bladder-sparing treatments (i.e., BCG re-induction, intravesical chemotherapy or pembrolizumab) within 90 days following an initial recurrence, subsequent disease recurrence during the observation period was evaluated using Kaplan-Meier (KM) time-to-event analysis
 - Disease recurrence was defined as having transurethral resection of bladder tumor (TURBT), biopsy, BCG re-induction, intravesical chemotherapy, cystectomy, radiotherapy, systemic chemotherapy, or immunotherapy

Figure 1: Study Design Scheme



BCG: Bacillus Calmette-Guérin; HR-NMIBC: high-risk non-muscle invasive bladder cancer.

Figure 2: Sample Selection



BC: bladder cancer; BCG: Bacillus Calmette-Guérin; CIS: carcinoma in situ; HR-NMIBC: high-risk non-muscle invasive bladder cancer; ICD-9-CM/ICD-10-CM: International Classification of Disease, Ninth/Tenth Revision, Clinical Modification; ICD-O-3: International Classification of Diseases for Oncology, Third Edition; TURBT: transurethral resection of bladder tumor.

Results

Patient characteristics

- Overall, 2,016 BCG-experienced papillary-only Medicare beneficiaries with recurrent HR-NMIBC were observed, of which 262 received subsequent treatment within 90 days of recurrence (Figure 2)
- Among these patients, the mean age was 76 years, 78% were male, and 94% were White (Table 1)

Table 1: Baseline Patient Characteristics

	BCG-experienced patients with recurrent papillary-only HR-NMIBC N = 262
Age at diagnosis, mean ± SD [median]	76.3 ± 6.1 [75.5]
Male sex, n (%)	205 (78.2)
White race, n (%)	245 (93.5)
Year of diagnosis, n (%)	
2008-2011	29 (11.1)
2012-2015	52 (19.8)
2016-2019	123 (46.9)
2020-2021	58 (22.1)
US region, n (%)	
West	111 (42.4)
South	57 (21.8)
Northeast	48 (18.3)
Midwest	46 (17.6)
Residential setting, n (%)	
Urban	218 (83.2)
Rural	44 (16.8)
Medicare plan enrollment, n (%)	
Fee-for-Service	201 (76.7)
Medicare Advantage	61 (23.3)
Quan-CCI, mean ± SD [median]	1.6 ± 1.8 [1.0]
Urinary tract infection, n (%)	87 (33.2)
Smoking, n (%)	84 (32.1)
Kidney stone, n (%)	35 (13.4)

BCG: Bacillus Calmette-Guérin; CCI: Charlson Comorbidity Index; HR-NMIBC: high-risk non-muscle invasive bladder cancer; SD: standard deviation; US: United States.

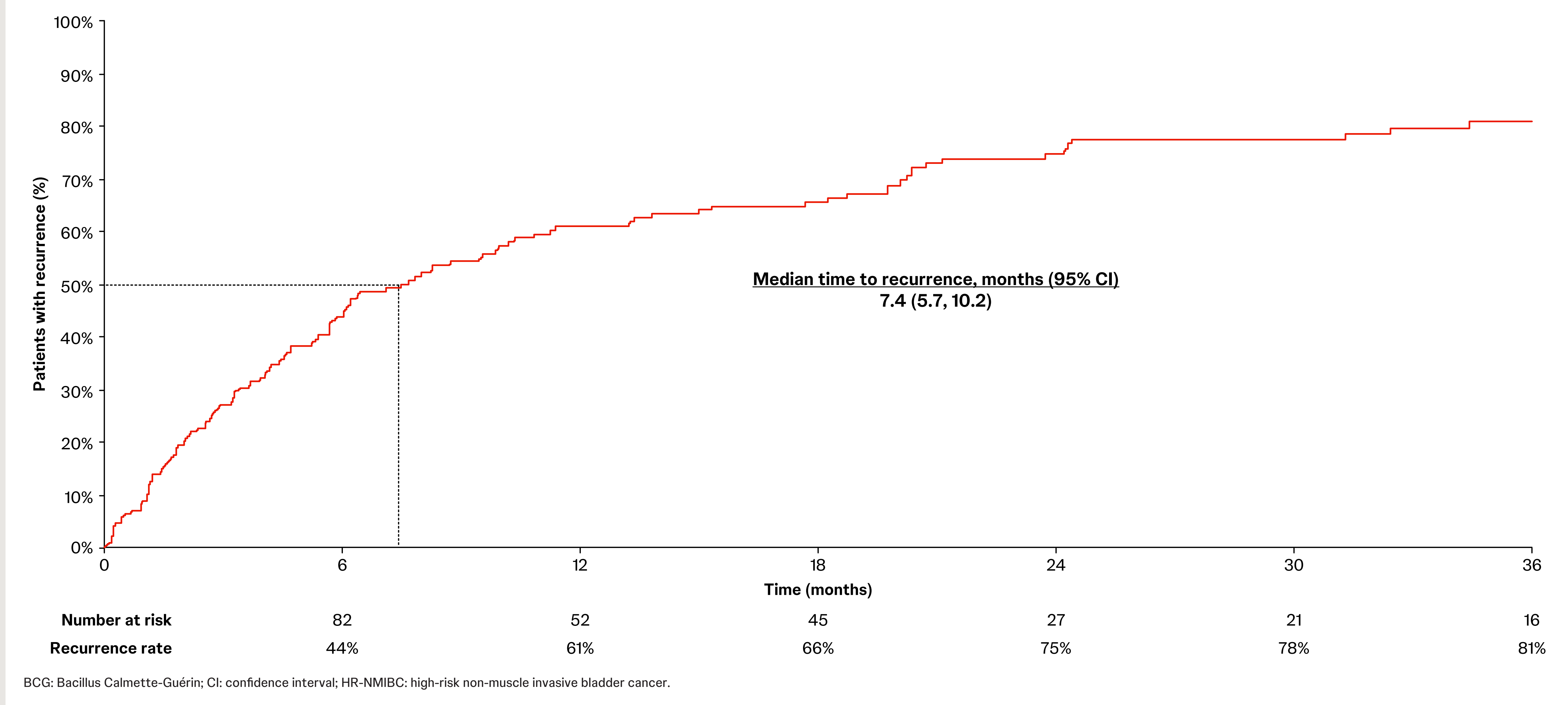
Treatment patterns

- Among patients who received subsequent treatment within 90 days of initial disease recurrence, most (63%) received bladder-sparing treatment options, with the most common being intravesical chemotherapy (34%), followed by BCG re-induction (20%), and immunotherapy (9%)
- Cystectomy was performed for 37% of patients who received subsequent treatment within 90 days following an initial recurrence

Disease recurrence

- Among patients treated with bladder-sparing options within 90 days following an initial recurrence (n = 164), the median time to subsequent recurrence was 7.4 months (95% confidence interval: 5.7, 10.2), with KM rates of subsequent recurrence of 27% at 3 months, 44% at 6 months, 61% at 12 months, 75% at 24 months, and 81% at 36 months (Figure 3)

Figure 3: Time to disease recurrence among BCG-experienced patients with recurrent papillary-only HR-NMIBC (N = 164)



BCG: Bacillus Calmette-Guérin; CI: confidence interval; HR-NMIBC: high-risk non-muscle invasive bladder cancer.

Limitations

- This study is subject to limitations common to retrospective claims analyses, including potential coding inaccuracies, missing data, and incomplete documentation, which may result in misidentification of study variables
- The HR-NMIBC diagnosis date was defined as the earliest available indicator (i.e., staging or diagnosis codes) in the data, which may not reflect the true disease onset
- As the dataset did not include clinical measures of disease recurrence, an algorithm to identify recurrence events was applied; given the use of HR-NMIBC treatments as indicators of recurrence, the number of patients receiving a subsequent treatment may be underestimated
- Results reflect data observed until the end of 2022, which may not be representative of more recent guidelines and HR-NMIBC treatment landscape
- Findings may not be fully generalizable to patients not covered by Medicare insurance

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