

Prognostic Value of PD-L1 Expression in Patients with Non-Muscle-Invasive Bladder Cancer: A Systematic Review and Meta-Analysis

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Guo, S; Wang, ZF.

Corresponding author:

Shuai Guo

mnwk639@163.com

Author Affiliation:

Department of Urology, Suzhou
Ninth People's Hospital, Suzhou,
Jiangsu, China.

ADMINISTRATIVE INFORMATION

Support - This work received no specific funding.

Review Stage at time of this submission - Data extraction.

Conflicts of interest - None declared.

INPLASY registration number: INPLASY2026100073

Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 15 October 2026 and was last updated on 15 October 2026.

INTRODUCTION

Review question / Objective To assess the prognostic value of PD-L1 expression in NMIBC, and to explore whether the detection platform modifies the pooled effect on survival outcomes..

Condition being studied Non-muscle-invasive bladder cancer (NMIBC).

METHODS

Participant or population Patients with histologically confirmed non-muscle-invasive bladder cancer (NMIBC: Ta, T1, or CIS)..

Intervention Not applicable. This is a prognostic study; the exposure of interest is PD-L1 expression, not a therapeutic intervention..

Comparator Patients with low or negative PD-L1 expression, compared with patients with high or positive PD-L1 expression..

Study designs to be included Prospective or retrospective cohort studies (observational studies)..

Eligibility criteria Inclusion criteria:

- (1) Population: patients with histologically confirmed non-muscle-invasive bladder cancer (NMIBC: Ta, T1, or CIS), any age, sex, or ethnicity.
- (2) Exposure: PD-L1 expression (high vs. low, or positive vs. negative) measured in tumor tissue, blood, or circulating tumor cells, by any method (immunohistochemistry [IHC], mRNA, or CTC-based assays).
- (3) Comparator: patients with low or negative PD-L1 expression.
- (4) Outcomes: at least one of recurrence-free survival (RFS; primary outcome), progression-free survival (PFS), cancer-specific survival (CSS), or disease-free survival (DFS).
- (5) Study design: prospective or retrospective cohort studies.
- (6) Reported a hazard ratio (HR) with 95% CI, or provided data sufficient for estimation.

Exclusion criteria:

- (1) Muscle-invasive or metastatic bladder cancer, or mixed-stage cohorts from which NMIBC data could not be extracted.
- (2) Non-urothelial bladder tumors (squamous cell carcinoma, adenocarcinoma, etc.).
- (3) Reviews, case reports, conference abstracts, and animal studies.
- (4) Duplicate publications (only the most complete dataset was included).
- (5) Studies from which HR or survival-curve data could not be obtained..

Information sources PubMed, Embase, Web of Science, and the Cochrane Library..

Main outcome(s) Recurrence-free survival (RFS); effect measure: hazard ratio (HR) with 95% CI..

Quality assessment / Risk of bias analysis

Quality of included cohort studies will be assessed using the Newcastle–Ottawa Scale (NOS); studies scoring ≥ 7 of 9 points will be considered high quality. Two reviewers will assess independently, with disagreements resolved by a third reviewer..

Strategy of data synthesis HRs with 95% CIs will be pooled using a random-effects model; heterogeneity assessed by I^2 and Q test; subgroup and sensitivity analyses performed. Analyses in Stata; $P < 0.05$ significant..

Subgroup analysis Subgroup analyses will be performed according to the detection platform (immunohistochemistry [IHC], mRNA, and circulating tumor cells [CTC])..

Sensitivity analysis Leave-one-out sensitivity analysis will be performed..

Country(ies) involved China.

Keywords PD-L1; non-muscle-invasive bladder cancer; prognosis; recurrence-free survival; meta-analysis.

Contributions of each author

Author 1 - Shuai Guo.

Email: mnwk639@163.com

Author 2 - Zhenfan Wang.