International Platform of Registered Systematic Review and Meta-analysis Protocols

INPLASY

A meta-analysis of UCA1 accuracy in the detection of bladder cancer

INPLASY202390042
doi: 10.37766/inplasy2023.9.0042
Received: 13 September 2023
Published: 13 September 2023

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ADMINISTRATIVE INFORMATION

Support - No financial support.

Review Stage at time of this submission - Completed but not published.

Conflicts of interest - None declared.

INPLASY registration number: INPLASY202390042

Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 13 September 2023 and was last updated on 13 September 2023.

INTRODUCTION

Review question / Objective This study aims to evaluate the clinical utility of urothelial carcinoma-associated 1 (UCA1) in diagnosing bladder cancer. Participants: patients with bladder cancer and controls without bladder cancer. Intervention: none. Control: samples can be healthy people and patients with benign urinary tumors, inflammation of the urinary system, urinary stones, etc. Outcome: the diagnostic accuracy of bladder cancer. Study design: meta analysis.

Condition being studied Bladder cancer (BCa), a prevalent genitourinary malignancy, recorded nearly 550, 000 new global cases in 2018. Urothelial carcinoma associated 1 (UCA1) is a highly expressed lncRNA in BCa and now increasing evidences have showed that UCA1 is a potential non-invasive diagnostic biomarker for BCa.

METHODS

Search strategy Systematic searches were performed in electronic databases (including PubMed, Web of Science, ScienceDirect, CNKI, Wanfang, and VIP) up until July 20, 2023.

Participant or population Patients with bladder cancer and controls without bladder cancer. Samples can be healthy people and patients with benign urinary tumors, inflammation of the urinary system, urinary stones, etc.

Intervention None.

Comparator None.

Study designs to be included Inclusion criteria: (1) BCa patients were verified using histopathology; (2) Studies investigating the relation between UCA1 and BCa; (3) Type and number of case-control groups clarified; (4)

Studies providing adequate data for constructing a two-by-two diagnostic quadruple table; (5) Studies released in Chinese or English.

Eligibility criteria Inclusion criteria: (1) BCa patients were verified using histopathology; (2) Studies investigating the relation between UCA1 and BCa; (3) Type and number of case-control groups clarified; (4) Studies providing adequate data for constructing a two-by-two diagnostic quadruple table; (5) Studies released in Chinese or English.Exclusion criteria: (1) reviews, comments, case reports; (2) Studies lacking adequate data for constructing the two-by-two diagnostic quadruple table; (3) Repetitively published papers; (4) Sample size less than 30.

Information sources Articles published in either English or Chinese from the inception of the databases until July 20, 2023, which connected to the UCA1 as a diagnostic biomarker for BCa, were comprehensively reviewed across numerous digital databases. Three international databases (PubMed, Web of science and Science Direct) and three Chinese databases (Wanfang data, CNKI and VIP) had been conducted for related literature.

Main outcome(s) The diagnostic accuracy of bladder cancer. Pooled sensitivity and specificity were calculated to assess the overall diagnostic accuracy of UCA1. Moreover, the positive likelihood ratio (PLR) was used to evaluate the chances that patients with a positive screening test truly have the disease, while the negative likelihood ratio (NLR) shows the possibility of the opposite. Additionally, the area under the curve (AUC) was subsequently computed and the summary receiver operating characteristic curve (SROC) was plotted.

Quality assessment / Risk of bias analysis The quality of the included studies was independently assessed by two reviewers using the QUADAS-2 tool. Discrepancies pertaining to quality assessment were resolved via consensus.

Strategy of data synthesis Data analysis and drawings were conducted by Meta-Disc 1.4 and STATA 14.0. The I^2 and x^2 statistics have been applied to evaluate the heterogeneity among the selected researches. When I^2 was greater than 50% or $P < 0.05$, the heterogeneity was judged to be significant. Owing to the presumed heterogeneity of the included research, a random effect model was utilized. Subgroup analyses had been conducted to assess the elements that contributed to the heterogeneity. Moreover, Deeks' funnel graph was adopted to weigh the possible presence of publication bias.

Subgroup analysis If the article has heterogeneity, we explore factors contributing to the heterogeneity. A subgroup analysis was executed, focusing on sample size (>100/≤100), specimen type (urine/tissue/blood) and ethnicity (Asian/European/African).

Sensitivity analysis Pooled sensitivity and specificity were calculated to assess the overall diagnostic accuracy of UCA1. Moreover, the positive likelihood ratio (PLR) was used to evaluate the chances that patients with a positive screening test truly have the disease, while the negative likelihood ratio (NLR) shows the possibility of the opposite. Additionally, the area under the curve (AUC) was subsequently computed and the summary receiver operating characteristic curve (SROC) was plotted.

Country(ies) involved China.

Keywords LncRNA; UCA1; bladder cancer; diagnosis; meta-analysis.

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