The Impact of Upfront Transurethral Resection of Bladder Tumor (TURBT) and Intravesical BCG versus Radical Cystectomy on Disease-Specific Survival of High-Risk Non-Muscle Invasive Bladder Cancer: A meta-analysis of comparative studies

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Introduction

High-risk non-muscle invasive bladder cancers (HRNMIBC), including TaG3, T1G2, T1G3, and/or Tis, carry an increased risk of progression, recurrence, and even death. The commonly used therapeutic approaches are TURBT+BCG or radical cystectomy (RC). So far, there have been no randomized clinical trials comparing the efficacy of these two different modalities. However, there continues to be some concerns regarding the long-term outcomes of the bladder preserving approach. Therefore, we conducted this meta-analysis to compare the relative risk (RR) of cancer-specific death rates between TURBT+BCG and RC in HRNMIBC.

Methods

A review of the medical literature was conducted using online databases. Inclusion criteria consisted of English language, diagnosis of high-risk non-muscle invasive urinary bladder cancers (HRNMIBC), comparative studies using TURBT+BCG versus RC, and studies that reported the incidence of cancer-specific death rates and disease-free survival. A meta-analysis using the Mantel-Haenszel method for calculating the weighted pooled RR under the fixed effects model was conducted. The heterogeneity statistic was subsequently incorporated to calculate the summary RR under the random-effects model.

Results

Three retrospective comparative studies with 4,734 patients were included and analyzed. All studies reported cancer-specific and all-cause death rates of TURBT+BCG versus RC in HRNMIBC. TURBT+BCG were found to have significantly lower RR of cancer-specific death in patients with HRNMIBC (RR=0.51, 95%CI 0.31-0.82; Fig.1), which continued to be significant even when using a propensity adjusted subgroup provided by one of the studies for analysis. Moreover, there was also a significantly lower RR of all-cause death rates in the TURBT+BCG group (RR=0.72, 95%CI 0.65-0.80; Fig.2). The rate of delayed cystectomies in the TURBT+BCG group was 22% (95%CI 8-41; Fig.3).

Conclusions

This is the first meta-analysis showing that TURBT+BCG is associated with a lower relative risk of cancer-specific and all-cause death compared to RC in patients with high-risk non-muscle-invasive bladder cancers. In the absence of randomized clinical trials and the failure of the BRAVO feasibility study to accrue, this meta-analysis represents the most compelling data supporting the use of TURBT+BCG in this patient population.