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Loss of heterozygosity for chromosomes 16q in Wilms' tumors predicts an outcome: a meta-analysis

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ADMINISTRATIVE INFORMATION

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

Conflicts of interest - None declared.

INPLASY registration number: INPLASY2023100060

Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 18 October 2023 and was last updated on 18 October 2023.

INTRODUCTION

Review question / Objective To investigate the survival in patients with WT of LOH at 16q, the study was performed by a meta-analysis to estimate event-free survival of WTpatients.

Condition being studied To investigate the survival in patients with WT of LOH at 16q, the study was performed by a meta-analysis to estimate event-free survival of WT patients. Databases via Pubmed, Embase, Cochrane, Web of science and Google scholar were searched before May 31, 2020, for randomized trials evaluating any intrapartum fetal surveillance method. A meta-analysis within a frequentist framework and assessed the quality and network inconsistency of trials were performed. The OR and 95% confidence interval (CI) were performed to report the relationship of event-free survival and LOH at 16q for WT patients.

11 cohort studies were evaluated in this meta-analysis to estimate relationship of event-free survival and LOH at 16q for WT patients (I2 =25%, P<0.001). As expected, LOH at 16q can be used as an effective predictor of event free survival in WT patients (Risk Ratio [RR] = 1.95, 95% CI: 1.52-2.49, P<0.001). LOH at 16q is a significant negative prognostic factor of the prognosis of WT patients. LOH at 16q is selectively detected in the treatment of WT patients.

METHODS

Participant or population The research for the search is evaluated by two reviewers based on the title, abstract and full text. The following inclusion criteria were applied: cohort design, inclusion of WT patients, comparison of LOH at 16q to control

group, survival as outcome, and reporting of odds ratio (OR), relative risk (RR) or hazard risk (HR) or any data sufficient to estimate these measures. The exclusion criteria were: reviews, conference abstracts, case reports, papers, or letters, and data that overlaps with another study.

Intervention n/a.

Comparator n/a.

Study designs to be included Strictly following the Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA) 2009 Checklist Protocol, two independent reviewers performed a literature search in three electronic databases (PubMed, Embase, Cochrane, Web of science and Google scholar). Studies published before May 31, 2020, were retrieved using the following key words: (16q [Mesh]) AND ((Wilms Tumor) OR [Mesh] (Tumor, Wilms) OR (Wilms Tumor) OR (Nephroblastoma) OR (Nephroblastomas) OR (Wilms' Tumor) OR (Tumor, Wilms') OR (Wilm Tumor) OR (Wilm's Tumor) OR (Bilateral Wilms Tumor) OR (Tumor, Bilateral Wilms) O.

Eligibility criteria The research for the search is evaluated by two reviewers based on the title, abstract and full text. The following inclusion criteria were applied: cohort design, inclusion of WT patients, comparison of LOH at 16q to control group, survival as outcome, and reporting of odds ratio (OR), relative risk (RR) or hazard risk (HR) or any data sufficient to estimate these measures. The exclusion criteria were: reviews, conference abstracts, case reports, papers, or letters, and data that overlaps with another study.

Information sources The meta-analysis was conducted using Cochrane Review Manager software (Rev Man 5.3). Continuous outcomes were measured by Std mean differences (SMDs) and dichotomous outcomes by risk ratios (RRs), both with 95% confidence intervals (CIs). Heterogeneity measurement was performed by forest plots as well as calculating I2 (> 50% was considered extensive heterogeneity). A fixed-effects model was used to combine study results if heterogeneity was minimal; otherwise, the random-effects model was used. Potential publication bias was also examined qualitatively by funnel plots using Rev Man software when the distribution of CI deviated significantly.

Main outcome(s) 11 cohort studies were evaluated in this meta-analysis to estimate relationship of event-free survival and LOH at 16q for WT patients (I2 =25%, P<0.001). As expected, LOH at 16q can be used as an effective predictor of event free survival in WT patients (Risk Ratio [RR] = 1.95, 95% CI: 1.52-2.49,P<0.001).

Quality assessment / Risk of bias analysis The meta-analysis was conducted using Cochrane Review Manager software (Rev Man 5.3). Continuous outcomes were measured by Std mean differences (SMDs) and dichotomous outcomes by risk ratios (RRs), both with 95% confidence intervals (CIs). Heterogeneity measurement was performed by forest plots as well as calculating I2 (> 50% was considered extensive heterogeneity). A fixed-effects model was used to combine study results if heterogeneity was minimal; otherwise, the random-effects model was used. Potential publication bias was also examined qualitatively by funnel plots using Rev Man software when the distribution of CI deviated significantly.

Strategy of data synthesis The meta-analysis was conducted using Cochrane Review Manager software (Rev Man 5.3). Continuous outcomes were measured by Std mean differences (SMDs) and dichotomous outcomes by risk ratios (RRs), both with 95% confidence intervals (CIs). Heterogeneity measurement was performed by forest plots as well as calculating I2 (> 50% was considered extensive heterogeneity). A fixed-effects model was used to combine study results if heterogeneity was minimal; otherwise, the random-effects model was used. Potential publication bias was also examined qualitatively by funnel plots using Rev Man software when the distribution of CI deviated significantly.

Subgroup analysis The meta-analysis was conducted using Cochrane Review Manager software (Rev Man 5.3). Continuous outcomes were measured by Std mean differences (SMDs) and dichotomous outcomes by risk ratios (RRs), both with 95% confidence intervals (CIs). Heterogeneity measurement was performed by forest plots as well as calculating I2 (> 50% was considered extensive heterogeneity). A fixed-effects model was used to combine study results if heterogeneity was minimal; otherwise, the random-effects model was used. Potential publication bias was also examined qualitatively by funnel plots using Rev Man software when the distribution of CI deviated significantly.

Sensitivity analysis The meta-analysis was conducted using Cochrane Review Manager software (Rev Man 5.3). Continuous outcomes were measured by Std mean differences (SMDs)

and dichotomous outcomes by risk ratios (RRs), both with 95% confidence intervals (CIs). Heterogeneity measurement was performed by forest plots as well as calculating I2 (> 50% was considered extensive heterogeneity). A fixed-effects model was used to combine study results if heterogeneity was minimal; otherwise, the random-effects model was used. Potential publication bias was also examined qualitatively by funnel plots using Rev Man software when the distribution of CI deviated significantly.

Country(ies) involved China.

Keywords Wilms tumor, Loss of heterozygosity, 16q, Survival time.

Contributions of each author
Author 1 - Yuanhua Song.
Author 2 - Wenling Li.
Author 3 - Zhen Yang.
Author 4 - Yan Gao.
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