INPLASY PROTOCOL

Corresponding author:
Ang Zheng

812144104@qq.com

Author Affiliation:
Department of Burn Plastic Surgery, Chaoyang Central Hospital, Chaoyang, Liaoning Province, China.

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Risk factors for anthracycline-induced cardiotoxicity in breast cancer treatment: A meta-analysis

Zhang, ML[1]; Yang, HG[2]; Xu, CC[3]; Jin, F[4]; Zheng, A[5].

Review question / Objective: Anthracyclines play an important role, even when targeted therapy and immunotherapy are emerging.However, despite its outstanding contribution to anti-tumor therapy, concomitant side-effects are non-ignorable, including hair loss, bone marrow suppression, gastrointestinal reactions and cardiotoxicity.The most serious one of which is cardiotoxicity.The purpose of this meta-analysis is to determine the risk factors for anthracycline-induced cardiotoxicity (ACT), so as to identify high-risk patients.

Condition being studied: Anthracyclines play an important role in the treatment of breast cancer (BC) and other malignant tumors. However, accompanied side-effects are non-ignorable. The purpose of this meta-analysis is to determine the risk factors for anthracycline-induced cardiotoxicity (ACT), so as to identify high-risk patients.

INTRODUCTION

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METHODS

Search strategy: This meta-analysis was performed according to the Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA) . The search for literature was conducted in PubMed, The Cochrane Library, Embase and Web of Science. The search strategy could be divided in three steps: Firstly, the type of disease was retrieved by the combination of subject words and free words, and "OR" was used in the middle. Cardiotoxicity, anthracyclines and breast neoplasms were linked by "AND". Secondly, the retrieval of research objectives was carried out. The retrieval of etiology was referred to McMaster university. "AND" was used between the first step and the second step. Finally, cardiotoxicity, anthracyclines, breast neoplasms, risk factors and their free words were selected as the retrieval words. It was searched independently by two researchers, and reached a consensus through discussion when the results diverged.

Participant or population: Breast cancer patients diagnosed by medical institutions and received adjuvant treatment with anthracyclines.

Intervention: Patients with adverse cardiac events after receiving anthracyclines.

Comparator: Patients received anthracyclines but did not have adverse cardiac events.

Study designs to be included: (1) The source of the case was BC patients diagnosed by medical institutions and received adjuvant treatment with anthracyclines. (2) The type of design was a case-control study or cohort study. (3) Relevant studies on the influencing factors for ACT were included (influencing factors for ACT were mentioned in at least three literature). (4) Odds ratio (OR) / hazard ratio (HR) and 95% confidence interval (CI) were provided in the results, or sufficient data could be provided for calculation.

Eligibility criteria: Inclusion criteria: (1) The source of the case was BC patients diagnosed by medical institutions and received adjuvant treatment with anthracyclines. (2) The type of design was a case-control study or cohort study. (3) Relevant studies on the influencing factors for ACT were included (influencing factors for ACT were mentioned in at least three literature). (4) Odds ratio (OR) / hazard ratio (HR) and 95% confidence interval (CI) were provided in the results, or sufficient data could be provided for calculation.Exclusion criteria: (1) Repeated publication of literature. (2) Unable to obtain the full text, incomplete data, or incorrect statistical methods. (3) Reviews, meta-analyses, conferences, comments, case reports and animal experiments. (4) Newcastle-ottawa scale (NOS) score < 6. (5) The definition of risk factors was significantly different from general standards or most studies.

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

Main outcome(s): Odds ratio (OR) / hazard ratio (HR) and 95% confidence interval (CI).

Quality assessment / Risk of bias analysis: This Meta-analysis used the NOS recommended by the Cochrane Collaboration for quality assessment. The NOS is mostly used in cohort studies or case control studies and includes selection, comparability and outcome/exposure, with a total eight items. A study can be awarded a maximum of one star for each numbered item within the selection and outcome/exposure categories. A maximum of two stars can be given for

comparability. Stars range from zero to nine, and six stars and above are considered high-quality literature . The NOS was done by two researchers independently, and the third researcher will resolve them if the results are different.

Strategy of data synthesis: The literature search process was performed independently by two investigators. If there was a disagreement, a third researcher would decide until the results were unified.

Subgroup analysis: We judged the heterogeneity according to Cochran Q and I^2 value. Cochran Q $P < 0.1$ or $I^2 \geq 50\%$ indicated that there was heterogeneity among the included studies. We further performed subgroup analysis or sensitivity analysis, otherwise random effect model was used.

Sensitivity analysis: We judged the heterogeneity according to Cochran Q and I^2 value. Cochran Q $P < 0.1$ or $I^2 \geq 50\%$ indicated that there was heterogeneity among the included studies. We further performed subgroup analysis or sensitivity analysis, otherwise random effect model was used.

Country(ies) involved: China.

Keywords: breast cancer, anthracyclines, cardiotoxicity, risk factors, meta-analysis.

Contributions of each author:
Author 1 - Meilin Zhang.
Author 2 - Hongguang Yang.
Author 3 - Changcun Xu.
Author 4 - Feng Jin.
Author 5 - Ang Zheng.