INPLASY

Influencing factors of unplanned CRRT in ICU patients: a Meta-analysis

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ADMINISTRATIVE INFORMATION

Support - Horizontal project of Shandong University.

Review Stage at time of this submission - Formal screening of search results against eligibility criteria.

Conflicts of interest - None declared.

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Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 28 October 2023 and was last updated on 28 October 2023.

INTRODUCTION

*R*eview question / Objective To identify the main influencing factors of unplanned disembarkation of CRRT in adult ICU patients through meta-analysis, in order to provide evidence-based evidence for reducing the risk of unplanned disembarkation in ICU patients receiving CRRT.

Condition being studied Continuous renal replacement therapy (CRRT) is designed to help remove toxins from the blood and promote the recovery of kidney function, and continuous cardiorporeal blood purification is a general term for all treatments that continuously and slowly remove water and solutes [1]. CRRT technology has been widely used in clinic as an important tool to save the lives of critically ill patients. Studies have shown [2] that 8%-10% of ICU patients receive kidney replacement therapy, but due to the particularity of CRRT technology, the complexity of operation and the influence of various factors,

many problems have been caused, forcing a high rate of unplanned treatment interruption, ranging from 17.14% to 74.51% [3]. This not only delays the time of treatment, affects the effect of treatment, but also increases the economic burden of patients and the workload of medical staff. In recent years, studies on CRRT unplanned disembarkation have increased, but they mainly focus on retrospective studies of related risk factors, and opinions are different. Therefore, this paper uses meta-analysis to identify the main influencing factors related to CRRT unplanned disembarkation, in order to provide scientific basis for reasonable CRRT care.

METHODS

Participant or population Study subjects: patients ≥18 years old and admitted to ICU for CRRT.

Intervention Unplanned disembarkation occurred in patients receiving continuous renal replacement therapy (CRRT).

Comparator No unplanned disembarkation occurred in patients receiving continuous renal replacement therapy (CRRT).

Study designs to be included After searching each database, two researchers strictly screened the references according to the inclusion and exclusion criteria respectively. If there was any disagreement, a third researcher was invited to evaluate the references, EndnotX9 software was used for literature management, NOS was used for quality evaluation, data was extracted for the final included references, and Revman5.3 was used for meta-analysis.

Eligibility criteria Inclusion criteria: (1) Study type: all observational studies in Chinese and English. (2) Study subjects: patients ≥18 years old and admitted to ICU for CRRT. (3) The literature data is accurate and complete or the required data can be calculated according to the data provided. (4) The quality of the literature was high, and the NOS score was >6 points. Exclusion criteria:(1) randomized controlled trial.(2) Literature review, conference report, case report, dissertation, etc. (3) Repeated publication or failure to obtain the full text.

Information sources CNKI database, Wanfang database, VIP database, Web of Science, Pubmed, Embase and Cochrane Library were searched by computer for the relevant observational studies published from the establishment of the database to September 2022. Two researchers strictly followed the inclusion and exclusion criteria.

Main outcome(s) The basic data collected included the first author/year of publication, study region, disease type, age, sex, sample size (number of unplanned disembarkation/number of unplanned disembarkation) and 29 major influencing factors. These include sex, age, treatment mode, whether anticoagulants are used, catheter placement, whether ventilators are used, whether blood products and fat milk are transfused, filter life, activated prothrombin time, prothrombin activity, red blood cell count, transmembrane pressure, blood flow velocity, intermittent saline irrigation, creatinine level, dilution mode, hemoglobin level, platelet count, and blood calcium level Albumin level, replacement fluid velocity, prothrombin time, hematocrit, International Normalized ratio, white blood cell count, organ failure score, blood potassium level, ICU admission time, replacement fluid velocity.

Quality assessment / Risk of bias analysis EndnoteX9 software was used to conduct independent literature screening and cross-check after quality evaluation according to inclusion and exclusion criteria by two researchers. If there is any disagreement, consult a third researcher and decide. Newcastle-Ottawa Scale (NOS) [4] was used to evaluate the quality of the included documents. The total score of the scale is 9 points, including the selection of research objects (0 ~ 4 points), comparability (0 ~ 2 points), and result determination (0 ~ 3 points). The higher the score, the higher the quality of the literature. Only high quality literature with NOS score >6 was included in this study.

Meta-analysis was performed using RevMan5.3 software. Standardized Mean Difference (OR) values (odds ratio), MD values (Mean Difference) and/or SMD values (95% CI) were used for binary and continuous data, respectively. Chi-square test was used for heterogeneity analysis. If P> 0.10 and I2 < 50%, the fixed effects model was used for meta-analysis; otherwise, the random effects model was used, and sensitivity analysis was performed to determine the stability of the results. The funnel plot was used to analyze publication bias for the relevant factors with the number of included articles ≥10. If the basic symmetry on both sides indicated that there was no publication bias, otherwise there was the possibility of publication bias.

Strategy of data synthesis Meta-analysis was performed using RevMan5.3 software. Standardized Mean Difference (OR) values (odds ratio), MD values (Mean Difference) and/or SMD values (95% CI) were used for binary and continuous data, respectively. Chi-square test was used for heterogeneity analysis. If P> 0.10 and I2 < 50%, the fixed effects model was used for meta-analysis; otherwise, the random effects model was used, and sensitivity analysis was performed to determine the stability of the results. The funnel plot was used to analyze publication bias for the relevant factors with the number of included articles ≥10. If the basic symmetry on both sides indicated that there was no publication bias, otherwise there was the possibility of publication bias.

Subgroup analysis Subgroup analysis was carried out in the way proposed one by one. When the source of heterogeneity could not be found, subgroup analysis was carried out according to the characteristics, quantity, research area and evaluation criteria of the research object.

Sensitivity analysis Random effect model and fixed effect model were used to observe the stability of the results.

Contributions of each author
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