INPLASY PROTOCOL

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Review Stage at time of this submission: Data extraction.

Conflicts of interest:
None declared.

Experimental Animal Models for Extracorporeal Life Support(ECLS) — Protocol of Systematic Review and Meta-Analysis

Wu, YW[1]; Li, YN[2].

Review question / Objective: The main aim of this review is to systematically evaluate the animal models of extracorporeal life support. P:Animal model of extracorporeal life support. I:Any intervention affecting the ECLS animal models. C:No treatment intervention. O:Animal species, sex, age and size; Induction method; Advantages and disadvantages; Clinical application. S:Published and unpublished randomized controlled trials (RCTs) meet the inclusion criteria, excluding non-randomized studies.

Condition being studied: Extracorporeal life support (ECLS), commonly known as extracorporeal membrane oxygenation (ECMO), is an improved extracorporeal circulation and respiratory support system, which provides extracorporeal cardiopulmonary function support for patients with refractory heart failure or respiratory failure when conventional treatment strategies are ineffective. The ethical issues related to the study of patients treated with ECLS need to develop the animal model of ECLS. ECLS animal model can provide valuable information for several characteristics of asthma pathogenesis and treatment. Although these models cannot perform all clinical features, they are valuable for understanding the mechanism and cure path of disease. Therefore, this review describes various methods and measurement parameters used to induce different animal ECLS animal models, which will help researchers use appropriate animals, methods and evaluation parameters according to their research design, and provide effective basis for the clinical application of ECLS.

INPLASY registration number: This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 15 January 2023 and was last updated on 15 January 2023 (registration number INPLASY202310043).

INTRODUCTION

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METHODS

Search strategy: In order to find the relevant research of ECLS experimental animal model, we searched the foreign language database (PubMed. Web of Science, Embase, etc.) and the Chinese database (HowNet, Wanfang, Vip).

Participant or population: Animal model of extracorporeal life support.

Intervention: The systematic literature review conducted according to the guidelines stated by PRISMA will evaluate the clinical application and definition of ECLS animal models, as well as the methods, advantages and disadvantages and evaluation parameters of inducing different animal ECLS animal models.

Comparator: Do not take intervention measures or sham treatment.

Study designs to be included: No limits on study design were imposed.

Eligibility criteria: 1.Inclusion criteria1.1Experimental design: Animal experiments refer to scientific research conducted in laboratories using animals as research objects for the purpose of acquiring new knowledge in biology, medicine,etc. or solving specific problems.1.2 Research objects:Animal models with stroke or traumatic brain injury. Animal models with stroke or brain injury modeling methods can be included. There were no restrictions on age, sex, species and modeling methods for the included subjects.1.3 Intervention measures: The experimental group must use Interventions. The control group did not take intervention measures, or sham treatment.1.4 Main outcome criteria: Animal species, sex, age and size; Induction method; Advantages and disadvantages; Clinical application.2. Exclusion criteria: documents such as repeated reports, poor quality, imprecise design, and unclear outcome specific data will be excluded.

Information sources: Both Chinese and English database resources will be searched for the identification of valid data, including CNKI, PubMed, Cochrane, Wanfang Database, VIP Database, Web of Science, and PubMed. We will search the databases from their inception to Jaunary 06,2023.

Main outcome(s): Animal species, sex, age and size; Induction method; Advantages and disadvantages; Clinical application.

Quality assessment / Risk of bias analysis: Using Revman tool, each study was assessed by two independent individuals . Bias was classified as low if criteria was met, high if criteria was not met and unknown if the information given did not allowed us to make a judgement for risk of bias. The risk of bias assessment was done for each of the following domains:

1. Sequence generation (selection bias) – Were treatments allocated randomly using a sequence generation method? Note that if authors mentioned that treatments were allocated randomly, but did not include the sequence generation process, we noted the study as "unknown" risk of bias for this element.

2. Blinding of personnel (performance bias) – Were the investigators or personnel performing the experiments blind to treatment when performing the behavioural tests?

3. Blinding of outcome assessors (detection bias) – Were the observers scoring the behaviour blind to treatment and individual identification?

4. Incomplete outcome data (attrition bias) – Is the data for each outcome complete? Are any events of attrition or exclusion form analysis reported? Is there consistency between the numbers in each group reported in the methodology and results?

5. Selective outcome reporting (reporting bias) – Is there alignment and consistency in the outcomes reported between the study predictions, methods, and results? Are most commonly reported outcomes present in the study results?

6. Other bias – Were there any other important issues regarding bias?

Strategy of data synthesis: Revman was selected for meta-analysis, and Chi square test or I2 test is used to evaluate heterogeneity. If I2 is greater than 50% and P<0.1, heterogeneity is considered. There is a random effect model of heterogeneous selection, and there is no fixed effect model of heterogeneous selection.For a small number of studies and inconsistent data, we will report a descriptive summary.

Subgroup analysis: If necessary, a possible subgroup analysis will be performed based on the heterogeneity analysis. The potential variables for subgroup analysis are type and detection time of animal models.

Sensitivity analysis: We will perform global or local sensitivity analysis to evaluate the effect of each research on the random effects model, if necessary.

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