INPLASY PROTOCOL

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Corresponding author:
Benjamin Hibbert

bhibbert@ottawaheart.ca

Author Affiliation:
University of Ottawa Heart Institute.

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Conflicts of interest:
None declared.

Prognostic factors for survival in cardiogenic shock – a systematic review and meta-analysis

Jung, RG[1]; Di Santo, P[2]; Stotts, C[3]; Fernando, S[4]; Abdel-Razek, O[5]; Motazedian, P[6]; Prosperi-Porta, G[7]; Harel-Sterling, L[8]; Goyal, V[9]; Rochwerg, B[10]; Tran, A[11]; Mathew, R[12]; Hibbert, B[13].

Review question / Objective: **What clinical and biochemical parameters are associated with in-hospital mortality in adult patients with cardiogenic shock?**
Condition being studied: **Prognosis from adult cardiogenic shock is generally poor, with roughly 50% of patients surviving to hospital discharge. Moreover, only early revascularization in the setting of acute myocardial infarction has been demonstrated to improve survival in cardiogenic shock and remains a cornerstone of management. It remains important for clinicians to understand the factors associated with survival from CS to provide accurate information to patients for informed goals-of-care discussions, and to consider cessation of in-hospital advanced therapy including inotropes, vasopressors, and mechanical circulatory support when the likelihood of survival is exceedingly low.**

INPLASY registration number: This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 15 March 2022 and was last updated on 15 March 2022 (registration number INPLASY202230072).

INTRODUCTION

Review question / Objective: **What clinical and biochemical parameters are associated with in-hospital mortality in adult patients with cardiogenic shock?**

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provide accurate information to patients for informed goals-of-care discussions, and to consider cessation of in-hospital advanced therapy including inotropes, vasopressors, and mechanical circulatory support when the likelihood of survival is exceedingly low.

METHODS

Search strategy: Two reviewers will identify relevant articles using the search term(s) "cardiogenic shock". The search will include articles from inception to January 31, 2022. Reviewers will search the following databases: PubMed, The Cochrane Library, CINAHL, EMBASE, Web of Science and the grey literature (including studies published only in abstract form).

Participant or population: Cardiogenic shock as defined by the authors.

Intervention: Cardiogenic shock. "Cardiogenic shock" must be defined according to authors' definitions on manuscripts.

Comparator: Patients surviving CS will be compared to patients who are deceased.

Study designs to be included: We will include English-language studies (including observational studies, randomized controlled trials, and non-randomized controlled trials) evaluating prognostic factors associated with survival to hospital discharge in adult patients with cardiogenic shock (CS). Only full-text studies will be included (i.e. conference abstracts will be excluded).

Eligibility criteria: Inclusion Criteria: Only English-language, full text studies will be included. We seek to include all randomized controlled trials, quasi-randomized studies, prospective cohort or retrospective cohort studies of hospitalized adult (≥16 years of age) patients with cardiogenic shock. "Cardiogenic shock" must be defined as a state of inadequate cardiac output state resulting in end-organ hypoperfusion following the individual study's definition.For any studies utilizing the same database, we will include the study with the greatest number of patients and exclude the other smaller studies. We require each study entered into meta-analysis to require either A) Raw data related to patients who died and those who survived, allowing for calculation of unadjusted odds ratios (ORs); and/or B) Publication of adjusted ORs, with adjustment factors including (at minimum) age and sex.Exclusion Criteria: We will exclude all pediatric studies, in vitro/in vivo studies, post-mortem studies evaluating CS, and studies exclusively evaluating extracorporeal membrane oxygenation or Tandem Heart.

Information sources: PubMed, The Cochrane Library, CINAHL, EMBASE, Web of Science and the grey literature (including studies published only in abstract form).

Main outcome(s): Adjusted short-term (i.e. to discharge or 30-day) survival.

Additional outcome(s): Unadjusted short-term (i.e. to discharge or 30-day) survival. Unadjusted intermediate (3-6 months) survival.

Quality assessment / Risk of bias analysis: Study quality will be graded using QUIPS and GRADE. Two reviewers will independently assess the risks of bias of the included studies. Disagreements will be resolved through consensus. A pre-planned sensitivity analysis, excluding all studies deemed to be at potential high risk of bias, will be conducted.

Strategy of data synthesis: Adjusted and unadjusted data will be pooled separately using Review Manager software. Forest plots of effect size (along with 95% confidence intervals) will be generated using Review Manager. As mentioned, to be included in meta-analysis, adjusted data must include at least age and sex as possible confounders. Statistical heterogeneity will be quantified using the I^2 statistic. Our primary analysis will focus upon the pooled adjusted data. Pooled unadjusted data will be presented as a secondary analysis.

Subgroup analysis: Subgroup analyses including age, sex, revascularization, acute myocardial infarction, and MCS use.

Sensitivity analysis: A pre-planned sensitivity analysis, excluding all studies deemed to be at potential high risk of bias, will be conducted.

Country(ies) involved: This review will be performed in Canada, evaluating all manuscripts of English language.

Keywords: Cardiogenic Shock; Humans; Prognosis.

Contributions of each author:
Author 1 - Richard Jung.
Author 2 - Pietro Di Santo.
Author 3 - Cameron Stotts.
Author 4 - Shannon Fernando.
Author 5 - Omar Abdel-Razek.
Author 6 - Pouya Motazedian.
Author 7 - Graeme Prosperi-Porta.
Author 8 - Lee Harel-Sterling.
Author 9 - Vineet Goyal.
Author 10 - Bram Rochwerg.
Author 11 - Alexandre Tran.
Author 12 - Rebecca Mathew.
Author 13 - Benjamin Hibbert.