INPLASY PROTOCOL

Corresponding author:
Yanwu Yu

yuyanwu951@163.com

Author Affiliation:
The First Affiliated Hospital of Zhengzhou University

Review Stage at time of this submission: Data analysis.

Conflicts of interest: None.

Safety of mechanical and manual chest compressions in cardiac arrest patients: A systematic review and meta-analysis

Gao, Y[1]; Sun, T[2]; Yuan, D[3]; Liang, H[4]; Wan, Y[5]; Yuan, B[6]; Yu, Y[7]; Li, Y[8].

Review question / Objective: The authors conducted a systematic review and meta-analysis of published studies to determine the safety of mechanical and manual chest compressions for cardiac arrest patients.
Condition being studied: Recent studies have reported that mechanical chest compressions were associated with more injuries to cardiac arrest patients than manual chest compressions, although these results remain controversial.
Information sources: PubMed, EMBASE, and Cochrane Library

INTRODUCTION

Review question / Objective: The authors conducted a systematic review and meta-analysis of published studies to determine the safety of mechanical and manual chest compressions for cardiac arrest patients.

Condition being studied: Recent studies have reported that mechanical chest compressions were associated with more injuries to cardiac arrest patients than manual chest compressions, although these results remain controversial.

METHODS

Participant or population: Cardiac arrest patients.

Intervention: Mechanical chest compression.

Comparator: Manual chest compression.

Study designs to be included: Cohort studies or randomized clinical trials.

Eligibility criteria: (1) the study participants included were cardiac arrest patients; (2) the study comparative arms were mechanical chest compression (AutoPulse or LUCAS) and manual chest compression; (3) the studies were observational cohort studies or randomized clinical trials; (4) all patients were adults; (5) the study papers were written in English; (5) the studies measured CPR-related injuries and the investigation method of injuries used was either by autopsy, post-mortem computed tomography (PMCT), or dedicated imaging.

Information sources: PubMed, EMBASE, and Cochrane Library.

Main outcome(s): The primary outcome were the overall rate of CPR-associated injuries and the incidence of severe or life-threatening injuries.

Additional outcome(s): The secondary outcome were skeletal fractures and visceral injuries.

Quality assessment / Risk of bias analysis: The randomized controlled studies were evaluated by the Jadad scale. In addition, the Newcastle-Ottawa Scale (NOS) was used to assess the risk of bias in the observational cohort studies.

Strategy of data synthesis: A meta-analysis of the random effects model was performed to calculate the pooled odds ratios (ORs) and 95% confidence intervals (CIs) for each patient outcome.

Subgroup analysis: Mechanical chest compression devices were subgroup in LUCAS and Autopulse when compared with manual chest compression.

Sensibility analysis: A sensitivity analysis was performed to assess the influence of any one study on the pooled OR and 95% CI, by omitting one individual study at a time.

Country(ies) involved: China.

Keywords: CPR, mechanical chest compression, manual chest compression, injuries

Contributions of each author:
Author 1 - Yanxia Gao.
Author 2 - Tongwen Sun.
Author 3 - Ding Yuan.
Author 4 - Huoyan Liang.
Author 5 - Youdong Wan.
Author 6 - Bo Yuan.
Author 7 - Yanwu Yu.
Author 8 - Yi Li.