Vasopressin and epinephrine versus epinephrine in management of patients with cardiac arrest: a meta-analysis


CRD summary
This review concluded that there was no evidence that vasopressin and epinephrine was more effective in treating cardiac arrest than epinephrine alone, except for reported 24-hour survival rate in one small study; further research was needed. The methods of the review and quality of included data were unclear and so the conclusions may be unreliable.

Authors' objectives
To assess the effectiveness of vasopressin and epinephrine in people with cardiac arrest.

Searching
MEDLINE (1966 to December 2008) and EMBASE (1950 to December 2008) were searched. Search terms were reported. Only studies published in English were sought. Reference lists of identified papers were checked.

Study selection
Randomised controlled trials that compared vasopressin and epinephrine to epinephrine alone in adults who had experienced a cardiac arrest and had been treated with cardiopulmonary resuscitation (CPR). There was no restriction on the sequence of drug administration. Diagnosis of cardiac arrest and CPR were based on international guidelines. The outcomes of interest were return of spontaneous circulation (ROSC), survival to hospital admission, at 24 hours and to hospital discharge, and neurological outcomes.

Between 56% and 74% of participants in the included studies were men. Mean age ranged from 60 to 70 years. Exclusion criteria varied across studies and included cardiac arrest due to trauma, terminal illness and pregnancy and those successfully defibrillated without drugs. Where stated, between 45% and 75% of arrests were witnessed, 45% to 83% were asystolic, 9% to 100% had ventricular fibrillation and 8% to 47% had pulseless electrical activity.

The authors did not state how the papers were selected for the review.

Assessment of study quality
The authors did not state that they assessed validity.

Data extraction
The authors did not state how data were extracted for the review.

Odds ratio (OR) and 95% confidence intervals were calculated for each study.

Methods of synthesis
Pooled odds ratios and 95% CI were calculated using a fixed-effect model. A random-effects model was used where heterogeneity was present. Chi^2 and I^2 were used to assess heterogeneity. Subgroup analyses were performed based on presence of asystole, ventricular fibrillation and pulseless electrical activity.

A funnel plot was used to investigate publication bias.

Results of the review
Six studies (5,208 participants) were included. Five studies were on out-of-hospital arrest: four RCTs (4,478 participants) and one cohort study that used historical controls (530 participants). The sixth study was an RCT (200 participants) on in-hospital arrest. No results were reported for this study. Study size ranged from 40 to 2,894
participants.

There was no statistically significant difference in ROSC between vasopressin and epinephrine and epinephrine alone (five studies). Subgroup analyses showed no effect on ROSC in those people with asystole, ventricular fibrillation or pulseless electrical activity.

Survival at 24 hours was improved with vasopressin and epinephrine (OR 2.99, 95% CI 1.43 to 6.28, I²=6%; two studies). There was no statistically significant difference in survival to admission (three studies) and at discharge (four studies) between the two groups.

Funnel plot showed no evidence of publication bias.

**Authors’ conclusions**

There was no evidence to suggest that use of vasopressin with epinephrine was favourable, except for an improvement in 24-hour survival rate that was based on a small number of participants.

**CRD commentary**

Although the inclusion criteria were clearly stated and only RCTs were eligible for inclusion, one of the included studies was an observational study. It was unclear whether any other observational studies may have been available; results for an apparently eligible RCT were not reported. The search covered several relevant sources. Only studies published in English were eligible. It was possible that language and publication biases affected the review. The authors’ tests failed to identify bias, but too few studies were available for an adequate assessment. The methods of study selection and data extraction were not described and it was not possible to say whether these were aimed at reducing reviewer error or bias. Study validity was not assessed and it was not possible to comment on the quality of the included data. It may not have been appropriate to combine results from RCTs and an observational study. Information about drug regimes used in the included studies was limited.

As the methods of the review and the quality of included data were unclear, the authors conclusions may be unreliable.

**Implications of the review for practice and research**

**Practice:** The authors stated that there was insufficient evidence to support use of vasopressin plus epinephrine in cardiac arrest.

**Research:** The authors stated that large RCTs were needed to assess use of vasopressin with epinephrine in cardiac arrest.

**Funding**


**Bibliographic details**


**Original Paper URL**


**Indexing Status**

Subject indexing assigned by CRD

**MeSH**

Drug Therapy, Combination; Epinephrine; Heart Arrest; Humans; Vasopressins
Accession Number
12010003760

Date bibliographic record published
20/10/2010

Date abstract record published
12/01/2011

Record Status
This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.