Defibrillation by basic emergency medical technicians: effect on survival

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Authors' objectives
To examine the published studies of early basic Emergency Medical Technician (EMT) defibrillation in the USA in order to learn whether this treatment has an effect on survival of out-of-hospital cardiac arrest when compared to treatment that did not include early defibrillation.

Searching
MEDLINE, Refline, and CINAHL were searched using key descriptors and the names of authors known to have performed research in the area of interest. Secondary searches on reference lists of articles on defibrillation and from the Citation Index were carried out.

Study selection
Study designs of evaluations included in the review
The author does not report the study designs included (probably case series).

Specific interventions included in the review
Out-of-hospital defibrillation carried out by emergency medical technicians.

Participants included in the review
People suffering out-of-hospital cardiac arrest were included.

Outcomes assessed in the review
Survival was assessed.

How were decisions on the relevance of primary studies made?
The author does not state how the papers were selected for the review, or how many of the reviewers performed the selection.

Assessment of study quality
The author does not state that they assessed validity.

Data extraction
The data were extracted by one researcher and a 20% sample was coded by a second researcher. Inter-rater reliability was measured as the number of item agreements for each study divided by the total number of items for each study. Mean inter-rater reliability was 0.89.

Methods of synthesis
How were the studies combined?
A meta-analysis was performed. This involved the calculation of a mean effect size with individual studies weighted by sample size.

How were differences between studies investigated?
The test for homogeneity (Q=3.196, p<0.50) indicated that the variance among the study effect sizes is what would be expected by chance alone.
Results of the review
Ten studies involving 4,017 patients were included.

A chi-squared value was recalculated for each study based on the raw data, and an effect size ‘r’, based on the square root of the chi-squared value divided by the sample size, was calculated to normalise effect sizes from individual studies. The overall mean effect size ($r=0.093$) indicates a 9.2% increase in survival of those who received early defibrillation by an emergency medical technician.

Authors' conclusions
Early defibrillation by emergency medical technicians as a means of increasing survival in out-of-hospital cardiac arrest, is strongly supported by the studies. The decision to implement such a programme must incorporate consideration of all of the variables influencing survival, including response time, transport time, proximity of advanced life support services, commitment of personnel and the needs of the community.

CRD commentary
No dates for the search are given. The author utilised only published data. There are a number of unpublished studies that have been conducted in this area. The included studies were limited to the USA. Similar programmes have been implemented in Canada and, given the similarity of delivery of emergency services, it might have been worthwhile including the published Canadian data. Survival is not defined - is this arrival at hospital, admission to intensive care, or discharge? In the discussion section, the author clearly outlines the limitations of the review in relation to the complexity of other confounding variables. The author does not include individual study details, thus limiting our ability to assess the study settings.

Bibliographic details

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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.