UK Critical Care Research Forum

A feasibility study of the use of mechanical chest compression devices at in-hospital cardiac arrest

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THE UNIVERSITY OF WARWICK

HEART of ENGLAND NHS Foundation Trust

Manchester Conference Centre

Background

- **1.5 in-hospital cardiac arrests for every 1,000 hospital admissions**
- **Survival to discharge- 18.4%**
- **High quality chest compressions improve survival, but challenging to deliver**

Background

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Out-of-hospital cardiac arrest (Gates 2015, unpublished)

- Meta-analysis of OOHCA RCTs
- Five studies- 12206 patients
- No effect on 30-day/ hospital survival

In-hospital cardiac arrest (Brooks 2014)

- One RCT reports hospital survival
- 150 patients
- Hospital survival- OR 2.81 (95% CI 1.26-6.24)

Background

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Survey of clinicians at Resuscitation Council (UK) Symposium, 2014

- 224 responses to paper survey
- Clinical equipoise regarding routine use of mechanical chest compression devices for in-hospital cardiac arrest
- Support for clinical trial

Research questions

In adult in-hospital cardiac arrest patients that present in a non-shockable rhythm (P), does the use of a mechanical chest compression device (I) compared with manual chest compressions (C) improve hospital survival (O)?

The proposed study

Randomised controlled trial to assess the feasibility of undertaking large effectiveness trial

Planned intervention/ comparator

Mechanical v manual chest compressions for duration of cardiac arrest

The proposed study

Randomisation and bias

1:1 envelope randomisation

Recruitment process undertaken by cardiac arrest team to facilitate 24/7 recruitment

Impossible to blind clinicians to intervention

- Most outcomes objective
- Blinded researchers assess neurological outcome

The proposed study

Inclusion criteria

Adult patients that sustain an in-hospital cardiac arrest

Non-shockable rhythm

Exclusion criteria

Traumatic cardiac arrest

DNACPR order

Pregnancy

The proposed study

Follow-up to six-months to include quality of life assessment

Key outcome measures focussed on feasibility of conducting large RCT, e.g. recruitment rate, effectiveness of study processes

The proposed study

Proposed sample size- 330

Recruitment over 24-month period at two large hospitals

The proposed study analysis

Main focus of analysis will be feasibility of undertaking effectiveness trial

Rationale for sample size

- **Precision of estimate of recruitment rate**
- **Assess if clinically important treatment effect can be ruled out using feasibility trial data- 80% one-sided confidence interval**

Details of study team

Dr Keith Couper

Prof Gavin Perkins

Prof Tom Quinn

Dr Ranjit Lall

Mrs Anne Devrell- PPI

Current status

Applications for funding made

Research for Patient Benefit

NIHR post-doctoral fellowship

Aim of presentation at UKCCRF

General review and critique