Inpatient Management of Out of Hospital Cardiac Arrests

Study protocol

Study Advisory Group

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Introduction

Ambulance services in England attempt cardiopulmonary resuscitation (CPR) for about 28,000 Out of Hospital Cardiac Arrests (OHCA) per year[1]. Overall survival to hospital discharge is around 8% (range 4-14%). 20-25% of those who receive CPR are admitted to hospital. Of those, the proportion that survives to discharge varies widely among regions (range 10-50%)[1].

In hospital, most survivors are admitted to intensive care units (ICUs). Data from the Intensive Care National Audit & Research Centre (ICNARC) indicate that around 5,000 reach ICUs (England, Wales, Northern Ireland) and spend, on average, 5 days there[2]. Some have immediate coronary angiography (sometimes after CT brain scanning) ± Percutaneous Coronary Intervention (PCI). British Cardiovascular Intervention Society (BCIS) data (2013) show that 1,342 people, ventilated following OHCA, underwent primary PCI[3]. Marked variation in practice occurred between centres. Many patients receive implantable cardioverter-defibrillators (ICDs). Better immediate responses to OHCA and optimal early hospital treatment should increase survival and improve quality of survival. Some survivors have neurological impairment and need neuro-rehabilitation (a service which may be under-provided). The median length of hospital stay for survivors of OHCA admitted to ICU is 20 days[2]. Some hospitals have no management protocol for such patients; where they have, many elements of the pathway vary (e.g. decision to admit, duration of ICU stay, prognostication, treatment withdrawal, organ donation).

OHCA survivors are included in various audits (e.g. MINAP, BCIS, BHRS, ICNARC) but the lack of ICD-10 code for OHCA makes these patients difficult to identify on HES data. As NHS England and various agencies strive to improve survival after OHCA, understanding variation in practice and clinical outcomes would be immensely helpful. An NCEPOD enquiry would provide valuable information to enhance quality of care and outcomes.

References

Couper K, Kimani PK, Gale CP, Quinn T, Squire IB, Marshall A, et al. Variation in outcome of hospitalised patients with out-of-hospital cardiac arrest from acute coronary syndrome: a cohort study. Health Serv Deliv Res 2018;6(14).

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Rawlins John, Ludman Peter F, O'Neil Darragh, Mamas Mamas A., de Belder Mark, Redwood Simon, Banning Adrian, Whittaker Andrew, Curzen Nick, Variation in emergency percutaneous coronary intervention in ventilated patients in the UK: insights from a national database, Cardiovascular Revascularization Medicine (2017)

Aims and Objectives

Aim

To investigate variation and remediable factors in the processes of care of patients admitted to hospital following an OHCA.

Objectives:

Review the in-hospital management of patients that have had an OHCA with return of spontaneous circulation (ROSC) from admission to discharge/death, particularly focusing on the areas of care listed below:

- Consistency of management
- Agreed management protocols and adherence to them
- Method/frequency of temperature control
- Length of ICU and ward stay
- Specialties admitted to
- How and when is prognostication and withdrawal of treatment undertaken
- Survivors assessed by heart rhythm specialist
- Availability of rehab support

Methodology

Population

All adult patients (aged 16 and older) that arrive in hospital after suffering an OHCA and achieve subsequent return of spontaneous circulation (ROSC) over a one year period (00:00 1st January 2018 - 23:59 31st December 2018).

Patients will be identified retrospectively using the following ICD10 codes in combination with the Emergency Department discharge location which will act as a surrogate marker for those who achieved ROSC. Please note, patients that have a sustained ROSC but then die in the Emergency Department will still be included.

- I46.0 – cardiac arrest, with successful resuscitation
- I46.9 – cardiac arrest, cause unspecified

Exclusions

The following cases will be excluded from this study:

- Patients under the age of 16
- Cases where the patient's admission to hospital following OHCA and ROSC was due to trauma, drowning, drug overdose or poisoning
- Cardiac arrests which occur during inter-hospital transfers or on acute NHS hospital premises

Participating sites

Data will be collected from all hospitals in England, Scotland, Wales, Northern Ireland, the Channel Islands and the Isle of Man that receive and treat patients that have had an OHCA.

Sample size

There are approximately 30,000 treated OHCAs in the UK each year. Among these patients, 27.5% (8250) experience return of spontaneous circulation and 8.4% survive to hospital discharge. A sample size of approximately 1000 patients will be selected from the identified patients for clinician questionnaire dissemination and case note review. The number of cases included will be limited to a maximum of 10 per hospital.

Sample period

Data will be collected for all of 2018 (1st January to 31st December inclusive) to ensure the inclusion of patients from all relevant hospitals (numbers per hospital will vary greatly across the UK).

Case identification

Within each Trust/Health Board NCEPOD has a Local Reporter (usually employed in clinical audit) who is responsible for providing the details of cases for inclusion to NCEPOD. At the start of the study the Local Reporter will be contacted and sent details of the study criteria.

Patients that arrive in hospital having suffered an OHCA will be identified retrospectively through EDCS coding via completion of a spreadsheet with other selected data from central hospital records. This will include patient details (NHS number, hospital number, age), admission/discharge dates, patient destination after the emergency department and discharge location.

Method of data collection

Clinician questionnaire

A clinical questionnaire will be sent to the consultant who was responsible for the patient at the time of hospital admission. Within this there will be instruction to pass the questionnaire on to

most appropriate clinician. The questionnaires will be disseminated via the NCEPOD online questionnaire system which is accessed by NCEPOD local reporters.

Case notes for peer review

Photocopies of the case notes of each included patient will be requested at the time of questionnaire dissemination. A list detailing the required case note extracts will be included with each questionnaire. Upon receipt at NCEPOD the case notes will be made anonymous for patient identifiable information.

Reviewer Assessment form

A multidisciplinary group of reviewers will assess the anonymised case notes and clinician questionnaires at review meetings held at the NCEPOD office and give their opinion on quality of care via completion of the reviewer assessment form.

Hospital Organisational questionnaire

An organisational questionnaire will be disseminated to all participating sites and collect data on organisational aspects of care of patients suffering an OHCA.

Ambulance Organisational questionnaire

An organisational questionnaire will be disseminated to all Ambulance Trusts and collect data on organisational prehospital aspects of care of patients suffering an OHCA.

Method test

The method of data collection and the data collection materials will be tested to ensure that they are robust.

Analysis and review of data

Case Reviewers

A multidisciplinary group of reviewers will be recruited to review the data collected and provide opinion on the care received by this group of patients, from admission to discharge. The advisor group will be made up of physicians, surgeons and nurses relevant to the care of patients that have suffered a cardiac arrest

Data Entry

All clinician questionnaire data will be electronically collected and combined with data from the assessment form completed by the case reviewers. Quantitative data analysis will be undertaken using Excel and qualitative analysis will be undertaken by reviewing the themes arising from the Reviewer meetings.

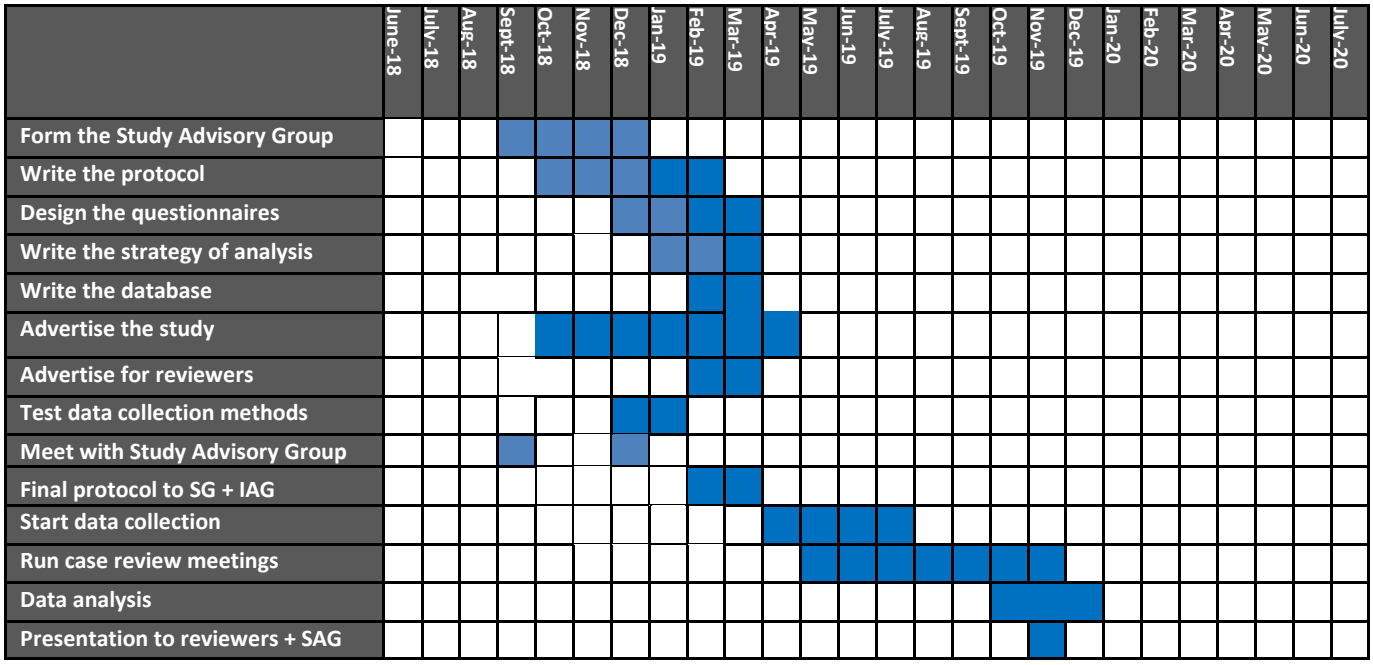
Confidentiality and data protection

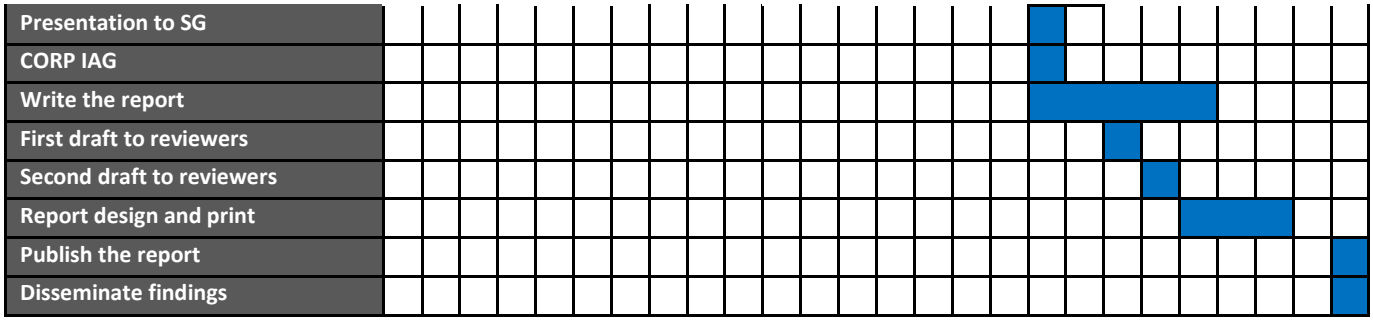
Once the data have been extracted by the NCEPOD researchers, the questionnaires and case notes will be anonymised to remove patient identifiers prior to review by the case reviewers. All electronic data are held in password protected files and all paper documents in locked filing cabinets. As soon as possible after receipt of data NCEPOD will encrypt electronic identifiers and anonymise paper documents. All electronic data are held in password protected files and all paper documents in locked filing cabinets. As soon as possible after receipt of data NCEPOD will encrypt electronic identifiers and anonymise paper documents. Section 251 approval will be applied for to perform this study without the use of patient consent in England and Wales. Public Benefit Privacy Panel approval will be applied for in Scotland.

Dissemination

On completion of the study a report will be published and widely disseminated.

Timescale




Presentation to SG
CORP IAG
Write the report
First draft to reviewers
Second draft to reviewers
Report design and print
Publish the report
Disseminate findings