Time to intervene: patients who had an in-hospital cardiorespiratory arrest

Rates of survival and recovery following in-hospital cardiac arrest are poor, with fewer than 20% of patients who have an in-hospital cardiorespiratory arrest commonly surviving to hospital discharge. Variables that impact on survival rate include age, comorbidities and the primary cardiac rhythm associated with the cardiorespiratory arrest and the underlying aetiology. For example cardiorespiratory arrests with a cardiac aetiology, e.g. associated with ventricular fibrillation, are more responsive to cardiopulmonary resuscitation and have a higher level of survival than those that are non-cardiac in cause with a primary rhythm of pulseless electrical activity or asystole. In this group the cardiorespiratory arrest often occurs following a period of progressive deterioration during which markers of physiological instability may become apparent. There are therefore issues around recognition of deterioration and intervention, and the appropriateness of decisions to administer cardiopulmonary resuscitation. This article will describe some of the main findings and recommendations of a study by the National Confidential Enquiry into Patient Outcome and Death (Findlay et al, 2012).

The aim of the study was: 'To describe variability and identify remediable factors in the process of care of patients receiving resuscitation in hospital, including: Factors affecting the decision to initiate resuscitation, the outcome and the quality of care following the resuscitation, determining antecedents in the preceding 48 hours, and possible opportunities for intervention' (Findlay et al, 2012).

From 1–14 November 2010 data were collected from hospitals across the country on every patient who suffered an in-hospital cardiorespiratory arrest that triggered a call to the resuscitation team (or equivalent) and lead to an attempt at resuscitation. Information on the resuscitation attempt was collected via the completion of a resuscitation form, then having identified the responsible consultant in these cases, data on the patient care before and after the cardiorespiratory arrest were collected via completion of a clinician questionnaire by this consultant. Questionnaires together with copies of the case notes were reviewed by a multidisciplinary group of advisors. A total of 526 sets of case note extracts and 585 completed clinician questionnaires were assessed.

The median age for the sample was 77 years (interquartile range 68–84 years). As well as being an elderly population, 70% of the sample in this study was assessed as having a fatal condition and in 22% of cases, this was considered to be rapidly fatal. It may be expected that do not attempt cardiopulmonary resuscitation decisions would be considered for this group as cardiopulmonary resuscitation in elderly patients with rapidly fatal conditions is frequently futile.

Initial assessment and admission

This study focused on the admission process to hospital, based on the premise that rapid, complete and accurate assessment of the patient was likely to lead to prompt, appropriate and comprehensive care. It was found that initial assessment was performed almost wholly by doctors in training and the majority was by basic grade doctors. This is not a problem if the initial care is of good quality and if there is a timely consultant review, but the reviewers found deficiencies in the initial assessment in 48% of cases. The deficiencies were in a number of areas of basic medical practice including: examination (85 cases), treatment plan (79 cases), and decision making with regards to cardiopulmonary resuscitation status (107 cases). Cardiopulmonary resuscitation status during the admission period was documented on admission in only 10% of cases, despite the high level of rapidly fatal disease on admission.

Recommendations for this section of the study included:

'CPR [cardiopulmonary resuscitation] status must be considered and recorded for all acute admissions, ideally during the initial admission process and definitely at the initial consultant review when an explicit decision should be made, and clearly documented (for CPR or DNACPR [do not attempt cardiopulmonary resuscitation]). When, during the initial admission, CPR is considered as inappropriate, consultant involvement must occur at that time.'

48 hours before cardiorespiratory arrest

The reviewers stated that in 75% of cases there were warning signs that the patient was deteriorating. Looking in the case notes to see if the patient exhibited standard markers of physiological instability, the reviewers found that in 72.5% of cases there was at least one of these markers, and that this had been present in 62% of these patients for longer than 6 hours, 47% longer than 12 hours and 20% longer than 24 hours. This provided a potential opportunity to intervene and influence patient outcomes if warning signs had been recognized and acted upon. This intervention may be new treatment to halt deterioration and improve outcome or it may be recognition that now the cardiopulmonary resuscitation status should be considered.

Looking at the clinical reviews of the patients, it appears that the issue is not a lack of access to clinical review. Many patients had frequent reviews, 205 patients had more than five reviews in the 48 hours before cardiorespiratory arrest. However, it appeared that there was a lack of escalation of care to more senior staff, with the proportion of senior staff conducting the first patient review being similar to the proportion that conducted the tenth consecutive review.

The reviewers also found that in only 21% of cases were there instructions to the nurses about when to alert medical staff that a patient was deteriorating. Yet according to the reviewers, nearly 80% of cases were monitored on a recognizable 'track and trigger' system, so patients are being 'tracked' without the subsequent 'trigger' happening. It seems that despite National Institute of Health and Clinical Excellence (2007) guidance and other documents, there are still problems with clinicians recognizing deteriorating patients and then intervening appropriately. The issues seem to be around the triggering of the escalation of care. One recommendation from this section of the study was:

'Where patients continue to deteriorate after non-consultant review there should be escalation of patient care to a more senior doctor. If this is not done, the reasons for non-escalation must be documented clearly in the case notes.'

Cardiopulmonary resuscitation status

It has already been noted that cardiopulmonary resuscitation status was recorded during the admission period in only 10% of cases. According to the responsible clinician, in 22% of cases the patient's cardiopulmonary resuscitation status was documented. Of those cases, 52 cases were 'do not attempt cardiopulmonary resuscitation'; this was in a sample of patients who all underwent a resuscitation attempt following cardiorespiratory arrest.

In the remaining cases, the most common reason (68%) given for the lack of decision was that 'Patient was for full and active management'. This is not a reason to avoid the issue of a cardiopulmonary resuscitation status. Fritz et al (2010) showed that many clinicians associate patients who have a do not attempt cardiopulmonary resuscitation decision with less than active treatment. However, a patient can be treated fully, but still have the option of whether to attempt cardiopulmonary resuscitation if he/she should have a cardiac arrest. The use of 'ceilings of treatment' documentation may be of benefit. It was recommended that:

'Health-care professionals as a whole must understand that patients can remain for active treatment but that in the event of a cardiac arrest CPR attempts may be futile. Providing active treatment is not a reason not to consider and document what should happen in the event of a cardiac arrest.'

Conclusions

Deficiencies in the care of patients who had an in-hospital cardiac arrest were noted in the admission process, decision making about cardiopulmonary resuscitation status, recognition of severity of illness and markers of risk, and requirement to escalate to more senior doctors. It appears that addressing these aspects of care before cardiac arrest provides the biggest opportunity to improve patient outcome. The data from this study give an overall picture of unreliability in the recognition of the deteriorating patient, failure to respond to deterioration reliably and failure to engage senior doctors to direct intervention either to prevent further deterioration or facilitate do not attempt cardiopulmonary resuscitation decisions. This report therefore raises two main challenges to all health-care professionals:

1. To ensure rapid and consistent recognition and management of acute illness in order to maximize patients' chances of recovery
2. To ensure that decision making about cardiopulmonary resuscitation is applied consistently, communicated effectively and that cardiopulmonary resuscitation is performed only on patients who are likely to benefit from it. **BJHM**

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Findlay GP, Shotton H, Kelly K, Mason M (2012) *Time to Intervene? A review of patients who underwent cardiopulmonary resuscitation as a result of an in-hospital cardiorespiratory arrest. A report by the National Confidential Enquiry into Patient Outcome and Death.* National Confidential Enquiry into Patient Outcome and Death, London

Fritz Z, Fuld J, Haydock S, Palmer C (2010) Interpretation and intent: a study of the (mis) understanding of DNAR orders in a teaching hospital. *Resuscitation* **81**(9): 1138–41

National Institute of Health and Clinical Excellence (2007) *Acutely ill patients in hospital. Recognition of and response to acute illness in adults in hospital.* Clinical Guideline 50. www.nice.org.uk/nicemedia/pdf/CG50FullGuidance.pdf (accessed 28 September 2012)

KEY POINTS

- There were deficiencies in various aspects of the initial assessment in 48% of cases and cardiopulmonary resuscitation status was documented on admission in only 10% of cases in the study.
- In the 48 hours before cardiopulmonary arrest the report found that in 75% of cases there was some warning that the patient was deteriorating, but there were issues around triggering an escalation of care to senior clinicians.
- The resuscitation status of patients was only recorded in 22% of cases, of which 52 patients were resuscitated despite being 'not for resuscitation'. In the remaining patients common reasons for the lack of a decision was that 'patient was for full and active management', suggesting that there is still some confusion between withdrawing care and a patient who has a status of do not attempt cardiopulmonary resuscitation in the event of cardiorespiratory arrest.