SHORT REPORTS

‘Do Not Attempt Resuscitation’ (DNAR) decisions in patients with femoral fractures: modification, clinical management and outcome

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Abstract

Background: increased provision of orthogeriatric expertise for patients with femoral fractures has led to implementation of ‘Do Not Attempt Resuscitation’ (DNAR) decisions prior to anaesthesia and surgery for fixation of their fractures. Review and modification of the DNAR decision by the medical team is necessary before surgery and is recommended by guidelines from the Association of Anaesthetists of Great Britain and Ireland (AAGBI) and the General Medical Council.

Methods: over a 17-month period, DNAR decisions were already present or were implemented for the first time in 22 patients prior to scheduled surgical fixation of their femoral fractures. Data were collected prospectively on each patient’s management, including modification of their DNAR decision, and outcome at 30 days and 1 year.

Results: two patients died prior to surgery. In eight of the 20 patients who underwent surgical fixation, there was no documentation regarding the status of the DNAR decision in the perioperative period. The 30-day mortality rate for those undergoing surgery was 15% (3/20). At 1 year, eight patients survived with six living in their own homes.

Conclusions: despite the favourable outcomes for hip fracture patients with pre-existing DNAR decisions, this audit showed inadequate review and documentation of the DNAR decision in advance of surgery.

Keywords: older people, resuscitation orders, anaesthesia, advance directives, femoral fractures, ethics

Introduction

The General Medical Council (GMC) publication in May 2010 entitled ‘Treatment and care towards the end of life: good practice in decision making’ [1] outlines some of the principles involved in ‘Do Not Attempt Resuscitation’ (DNAR) decisions, but offers little specific guidance on the best management of patients with pre-existing DNAR decisions in the perioperative period. This is despite guidelines published in 2009 by the Association of Anaesthetists of Great Britain and Ireland (AAGBI) entitled ‘Do Not Attempt Resuscitation (DNAR) Decisions in the Perioperative Period’ [2] which attempted to provide recommendations for anaesthetists, surgeons and other health care professionals faced with managing this difficult situation. The GMC guidance came into force on 1 July 2010. Failure of any medical practitioner to follow the GMC guidance will place their registration at risk [1].

The AAGBI guidelines arose following an editorial in Anaesthesia in 2006 highlighting the lack of guidance in the UK and Ireland for DNAR decisions in the perioperative period [3], compared with the USA and Canada where guidelines have existed since 1993 and 2002, respectively. The AAGBI guidelines provide a summary of the ethical and legal issues facing anaesthetists, surgeons and other health care professionals caring for patients scheduled for surgery and anaesthesia with a pre-existing DNAR decision in place. The recommendations in the AAGBI guidelines for how this situation should be managed are in accordance with the decision-making process in the GMC guidance and aim to protect anaesthetists and surgeons from accusations of malpractice and protect patients from dying in an undignified and traumatic manner.

The increased awareness of advance decision-making for end of life care, including decisions not to attempt
resuscitation, by patients, proxy decision makers and medical practitioners, especially orthogeriatricians, will inevitably increase the number of patients scheduled for surgery and anaesthesia with pre-existing DNAR decisions in place [1, 2]. A review of the DNAR decision by surgeons and anaesthetists, with agreed modification if indicated, is necessary while obtaining consent prior to surgery.

In auditing the management of patients with pre-existing DNAR decisions scheduled for operative fixation of their femoral fractures over a 17-month period, we sought to identify documentation of management plans for resuscitation during surgery and anaesthesia. We also sought to identify patient outcomes in the 1 year following their injury.

**Methods**

All patients with femoral fractures admitted to our fracture unit between May 2008 and September 2009 who had documented DNAR decisions in place and were scheduled for operative repair were identified by the orthogeriatric team. The fracture unit treats approximately 850 hip fracture patients per year.

Data recorded on all patients included their age, their normal place of residence (home, residential home or nursing home), the method of implementation of the DNAR decision (by a competent patient, following an advance directive or by the senior clinician involved in the patient’s care), the surgery scheduled, delays to surgery due to the DNAR decision, the DNAR management plan for anaesthesia and surgery (if documented), the type of surgery performed and the anaesthetic technique used. Outcome data (destination on discharge from the fracture unit, in-hospital, 30-day and 1-year mortality rates) on each patient were collected retrospectively from the Fractures Outcome Research Database in our hospital. This database has been in operation since 1999, and records patient demographics, surgical management and outcome at 30 days and 1 year obtained by telephone follow-up to the patient’s place of residence or to their general practitioner.

**Results**

Twenty-two patients were identified with femoral fractures and pre-existing DNAR decisions scheduled for surgical fixation during the 17-month period. There were 8 males and 14 females. The mean age was 85 (range 64–96). Patients were admitted from their own home (12 patients), a residential home (one patient) or a nursing home (nine patients).

The DNAR decision was implemented following discussion with four patients in whom competency was established. In the remaining 18 cases, the DNAR decision was implemented by the senior physician involved in the patients’ care, after consultation with their relatives, as they were no longer deemed to have competency to make decisions. The DNAR decisions were implemented because it was believed that cardiopulmonary arrest would be a spontaneous event in the culmination of the dying process for those patients who had terminal illness or poor quality of life.

The majority of the DNAR decisions were made for the first time on the fracture ward (20 patients). One patient had a DNAR decision implemented and still in place following a previous hospital admission, and one patient had a DNAR decision implemented following admission to a medical ward where they subsequently fell sustaining the fractured femur prior to transfer to the fracture unit.

A delay to surgery due to the pre-existing DNAR decision occurred in one patient with a femoral shaft fracture scheduled for intramedullary nail insertion because of disagreement between the anaesthetic, surgical and medical teams over the DNAR management option. A different and agreed management plan was made and followed 1 day later.

Two patients died prior to any attempt to perform the scheduled operative procedure, one from bronchopneumonia, one from cardiac failure in the presence of severe aortic stenosis. The other 20 patients underwent surgical fixation of their fractures with a mean delay from admission to surgery of 7.4 days compared with our target of 2 days for all hip fractures.

Of the 20 patients who underwent surgical fixation of their fracture, documented modification of the DNAR decision was recorded in 12 cases by the anaesthetist prior to anaesthesia and surgery. These modifications and documentation included the use of cardiopulmonary resuscitation (CPR), the use of defibrillation/DC cardioversion, the use of temporary ventilation in theatre and the use of vasopressor drugs. In eight cases, there was no documentation in the anaesthetic chart or medical notes as to the status of the DNAR decision in the perioperative period or the resuscitative measures that would be used.

Operative fixation of the femoral fractures was performed using a variety of techniques: sliding hip screw in 4 patients, hemiarthroplasty in 12 patients, intramedullary nail in 3 patients and cannulated screws in 1 patient.

Spinal anaesthesia was used in 18 of the 20 cases, with general anaesthesia administered in the other two. The spinal anaesthetic was supplemented with a fascia iliaca compartment block in five cases, with a femoral nerve block in nine cases and with femoral and lateral cutaneous nerve of thigh blocks in two cases. In two spinal anaesthetics, there was no nerve block performed. An arterial line was inserted in seven patients.

**Outcome data**

Of the 20 patients undergoing surgery, three patients (15%) died in the fracture ward, one within 24 h of surgery (chest infection, cardiogenic shock and fast atrial fibrillation), one on the 10th and one on the 14th postoperative days (both bronchopneumonia). The destinations of the 17 patients who survived to discharge from the fracture ward were: 14
to another hospital for further rehabilitation, 2 to a nursing home and 1 to a residential home.

30-day mortality
No further patients died between discharge from the fracture ward and 30 days post-injury. Therefore, the 30-day mortality rate was also 15% (three patients).

One-year mortality
At 1 year, 12 patients (60%) were deceased. The locations of the eight patients alive at 1 year were: six at home, one in a nursing home and one in hospital.

Discussion
Advance decisions, such as DNAR decisions, have arisen from society's demand for greater respect for patient autonomy in issues of health care. DNAR decisions are implemented on the assumption that cardiopulmonary arrest will be a spontaneous event that is the culmination of the dying process in a patient who has a terminal illness or poor quality of life [4]. The legal frameworks on which the implementation of DNAR decisions are based in the devolved UK countries is detailed in the AAGBI guidelines [2]. In summary, DNAR decisions may be implemented by the direct instructions of a competent patient, following an advance decision by a patient who now lacks capacity to make their own decisions, by the instructions of a legitimate proxy decision-maker appointed by a patient who lacks capacity, and finally by the senior clinician involved in the patient's care if the patient lacks capacity and no advance decision or proxy decision-maker exists. In England and Wales, the Mental Capacity Act 2005 provides the statutory framework [5]. The Adults with Incapacity (Scotland) Act 2000 provides a similar statutory framework in that country [6]. No current legislation exists in Northern Ireland to cover adults who lack capacity to make their own decisions and relies on the common law position that has developed in this area.

This audit was conducted in older people with femoral fractures requiring surgical fixation, many of whom lacked capacity to make their own decisions. This was reflected in the fact that the DNAR decisions were implemented by the senior orthogeriatrician involved in the patients' care in the majority (18 out of 22) of cases. The DNAR decisions in these instances were made following consultation with the patients' relatives or carers in order to determine what the patients' wishes would have been if they had been able to express them. In only 4 out of 22 cases were the DNAR decisions implemented following discussions with competent patients.

Anaesthesia and surgery may be indicated and appropriate for any patient with a pre-existing DNAR decision in place. Fixation of femoral fractures was appropriate in the DNAR patients involved in this audit as it was being performed to provide analgesia and enable mobilisation. The cardiorespiratory instability induced by the anaesthesia and surgery for the procedure immediately alters the assumptions on which the original DNAR decisions were based. Survival rates following anaesthetic related cardiopulmonary arrest can be as high as 92% which also impacts upon the original assumptions on which the DNAR decisions were made [7].

For these reasons, and to protect surgeons and anaesthetists from accusations of malpractice and assault if CPR was to be carried out during surgery and anaesthesia on a patient with a pre-existing DNAR decision in place, the AAGBI guidelines recommend the adoption of one of three management options with documentation of the option chosen in advance of any intervention. In Option 1 the DNAR decision is discontinued during anaesthesia and surgery and fully reinstated once the patient is discharged from the recovery room back to the ward. In the event of intra-operative cardiopulmonary arrest, CPR is to be carried out fully. In Option 2 the DNAR decision is modified to permit the use of drugs and techniques commensurate with the provision of anaesthesia, including decisions made on whether or not to use temporary manipulation of the airway and breathing with intubation and ventilation when needed, to use vasopressor or antiarrhythmic drugs, and whether to use electrical cardioversion, defibrillation or external chest compressions. In Option 3 no changes are made to the DNAR decision. Since many anaesthetic interventions could be interpreted as CPR in different circumstances the AAGBI Working Party suggest that in most instances this option is not compatible with the provision of anaesthesia for any type of surgical intervention.

Our audit showed that in 8 out of the 20 cases which proceeded to surgery there was no documentation in either the patients’ notes or in their anaesthetic records of any alteration to the pre-existing DNAR decision. This fails at many levels to comply with the recently published GMC guidance on ‘Treatment and care towards the end of life: good practice in decision making’ [1]. In all 12 cases in which documentation was present, modification was made to the pre-existing DNAR decision to enable various aspects of CPR including temporary ventilation, electrical cardioversion or defibrillation or the use of vasopressor or antiarrhythmic drugs. In no cases were external chest compressions included in the management plans, perhaps reflecting the potentially traumatic nature of this intervention on already extremely frail patients.

The AAGBI guidelines contain an appendix with a DNAR Management Consent Form that includes the three DNAR management options. Our hospital has now included the AAGBI guidelines into our DNAR policy document, and we plan to adopt the DNAR Management Consent Form in the near future.

While DNAR decisions indicate that cardiac or respiratory arrest is an expected part of the dying process, they do not necessarily mean that death is imminent. Our audit revealed that 17 of the 22 patients survived to hospital discharge, all 17 were still alive at 3 months, and eight were still alive at 1 year with six living in their own homes. This indicates the benefit that can be achieved for patients with pre-existing DNAR decisions and femoral fractures by pursuing surgical fixation of their fractures. However, our audit shows that management of these patients could be
improved by agreement and documentation of a DNAR management plan in advance of surgery and anaesthesia.

In conclusion, we advocate the adoption of the AAGBI guidelines on ‘DNAR Decisions in the Perioperative Period’ into the practice of orthogeriatricians, surgeons and anaesthetists in order to ensure compliance with the recent GMC guidance on ‘Treatment and care towards the end of life: good practice in decision making’ which came into force on 1 July 2010. Hospitals should consider adopting the AAGBI guidelines as policy, and in particular they should consider the use of a DNAR Management Consent Form based on the pro forma included in the guidelines.

Key points

- All DNAR decisions should be reviewed prior to surgery and anaesthesia.
- Modification of the DNAR decision should be documented in the patient’s notes.
- Recent AAGBI and GMC guidelines have been published to guide decision making with pre-existing DNAR decisions.
- Surgical fixation of femoral fractures offers analgesia and mobilisation with favourable outcomes at 1 year for hip fractures with pre-existing DNAR decisions.

Conflicts of interest

None declared.

References


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Cardiovascular diseases are largely underreported in Danish centenarians

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Abstract

Background: the substantial decline in oldest old mortality has led to more people surviving to very old age. As morbidity and disability generally increases with age epidemiological research in ageing has focused on the health of oldest olds. However, most studies are based on self-reported or physician-reported information, not objective health information.

Objective: to estimate and compare the prevalence of cardiovascular diseases (CVDs) in Danish centenarians using three different sources of information: self-reported, physician-reported and objective data.