End-of-Life-Issues: Withdrawal and/or Withholding of Life Sustaining Health Care: A Comparison between Emergency Physicians and Intensive Care Specialists

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Abstract
Objectives: Investigate and compare the process of withdrawing and/or withholding life-sustaining health care between Emergency Physicians and Intensive Care Specialists.

Materials: Prospective cross sectional questionnaire based study conducted in a tertiary referral hospital in Queensland, Australia. Primary outcomes were, which of the discussion and considerations, were rated most important in the decision making process. Secondary outcomes included the incidence of withdrawal and/or withholding that occurred and time to death.

Results: The study included 81 patients from the Emergency Department (ED) and 42 patients from the Intensive Care Unit (ICU). Treatment was withdrawn or withheld in 86.4% of the ED deaths and in 59.5% of the ICU deaths (p = 0.05). Emergency physicians rated co-morbidities (63.1%) and age (42.1%) more important than intensive care specialists who rated them very important (16.7% and 8.3%) respectively (p = 0.05). Intensive care specialists rated futility (87.5%) more important and considered organ donation more often (41.7%) than emergency physicians who rated them (54.7%) and (21.1%) respectively. Both rated prognosis as very important, intensive care specialists (91.7%) and emergency physicians (100%). Discussions with inpatient teams were considered more important by intensive care specialists. Less than 8% of patients were referred to a palliative care service. 69.9% of patients in ICU who had treatment withdrawn died within one hour compared to 20% of patients in the ED.

Conclusions: In the majority of deaths that occurred a decision was made to withdraw and/or withhold life sustaining health care. Intensive care specialists were more likely to provide full treatment and their patients died more quickly than emergency physicians. Few patients were referred to a palliative care service.

Keywords: End-of-Life; Withdrawal of Treatment; Emergency Department; Anesthesia and Intensive Care; Palliative Care

Introduction

The emergency department (ED) and the intensive care unit (ICU) are clinical settings where critical life saving interventions is initiated. Both work in spaces designed to save or prolong life. In the ED emergent care is delivered for a range of life threatening illnesses initiated. Both work in spaces designed to save or prolong life. In the ED emergent care is delivered for a range of life threatening illnesses and often invasive treatments are provided near death because they cannot be withheld in the first few minutes of care in the absence of information to the contrary [1]. A similar process also occurs in the ICU, often this relates to patients admitted from the ED where an initial decision making process has already taken place. Patients in ICU generally have had the benefit of a trial of therapy and intensive care specialists have had an opportunity to obtain more information about the patient, their wishes and the reversibility of their condition [2,3]. A recent review on futility and providing care to the terminally ill identified that up to 50% of medical staff knowingly provided excessive rather than under-treatment [4]. There has been more research in the ICU setting around the withdrawal process compared to the ED [2,5]. However there are no studies that have attempted to investigate if there are any differences between these two specialties who work in a similar critical care environment and whom both make decisions is to withdraw and/or withhold life-sustaining health care.

The primary objective of this study is to investigate the importance of the considerations and discussions that took place and describe any differences when a decision was made to withdraw and/or withhold life sustaining health care in the ED and the ICU.

Materials and Methods

Study design and setting

This was a prospective single center cross sectional questionnaire based study of deaths in the ED and ICU examining the decision to withdraw and/or withhold life sustaining health care. The treating clinician completed a questionnaire in regard to the factors considered and the discussions that had taken place prior to a decision to withdraw and/or withhold treatment. The study was conducted in a single tertiary referral adult Hospital in Queensland (Australia) with an annual census in excess of 70,000 patients to the ED and 2200 admissions to the ICU. Data was collected for 12 consecutive months in the ED and for four consecutive months in the ICU in 2010. The Human Research and Ethics Committee of the hospital approved the study.

Selection of participants

Every patient who died in the ED (main department or observation unit) and the ICU was identified, and eligible to have a questionnaire completed by the treating clinician. The following completed questionnaires were excluded from the final data analysis; any patient who received treatment without any withdrawal or withholding and those were the decision maker was not a consultant. Patients and treating clinicians were identified from the patient management systems by a site coordinator.

Data collection, questionnaire and processing

An original questionnaire was drafted and piloted for use in the ED and ICU. This is available as online appendix A. It includes questions relating the decision maker (emergency physician or intensive care specialist), level of treatment provided and if it was withdrawn or withheld and if a palliative care referral was made. Clinicians were asked to rate on five point Likert scales (5 = very important) the importance of ten possible factors in the
decision to withhold/withdraw life sustaining health care and of any discussions that took place. They could choose any number of factors and were not required to rank them. Data was also collected from the medical record and included age, gender, any objection by family and cause and time to death. Patient consent was waived by the ethics committee for this data collection. Each treating clinician was given a coded questionnaire to complete within 72 hours of the death which was returned to the site coordinator.

**Definitions**

Life sustaining health care was defined as any form of advanced health care that if not provided would result in the death of a patient. Full treatment was defined as care without any limitations, including cardiopulmonary resuscitation, intubation and ventilation, inotropes. Partial treatment was defined as any treatment with specified limitations e.g. non invasive ventilation, or ‘trial’ of inotropes. Treatment commenced then withdrawn was defined as any kind of treatment (full or partial) that was commenced but later was withdrawn. No treatment was defined as absence of additional active treatment after arrival to either the ED or ICU.

**Outcomes measures**

The co-primary outcomes of interest were which of the factors and discussions were considered most often and rated most important in the decision making process. Secondary outcomes were classification of decision maker, level of treatment provided, incidence of withdrawal and/or withholding of treatment, referral or discussion with the coroner, referral to a palliative care service and time to death of the patient.

**Primary data analysis**

Descriptive statistics were used to describe the baseline characteristics of the study patient and the decision maker. Median and interquartile ranges are reported for continuous variables. Percentages with 95% confidence intervals are reported for dichotomous variables including the primary and secondary outcomes. Pearson chi-square test was used to compare responses by emergency physicians and intensive care specialists. Analysis was performed using Statistical Package for Social Science (SPSS), version 20 (IBM, Armonk, NY, USA).

**Results**

**Characteristics of study subjects**

A total of 171 deaths were identified. Nine patients were excluded as no questionnaire was completed, 39 patients as the sole decision maker was not an emergency physician or intensive care specialist and a further 34 had full treatment without withdrawal or withholding leaving a final sample size of 89. Participant flow is summarized in figure 1.

**Main results**

Treatment was withdrawn or withheld in 80.2% of deaths in the ED compared to 57.1% of the deaths in the ICU deaths \((p < 0.05)\). On no occasion was the decision making deemed shared between the consultant and the registrar in the ICU setting, but it was in 4.2% of the cases in the ED (Table 2).

The relative importance of the factors and the discussions are

![Figure 1: Participant Flow - Patients and Providers](image-url)
summarized in table 3. The considerations rated most important by both Emergency Physicians and Intensive care specialists were prognosis and "patient's interests". Emergency Physicians placed more importance on co-morbidities and age while intensive care specialists placed more importance on futility and considered organ donation more often. The least important consideration for both specialties was ICU bed availability. The most important discussions for both specialties were with the family. Intensive care specialists rated discussions with sub-specialties (69.6%) more important than emergency physicians (25.4%) (\(p < 0.05\)).

Table 1: Characteristics of the patients died in emergency department and intensive care unit with a decision to withdraw/withhold treatment. *Data missing for one patient.

<table>
<thead>
<tr>
<th></th>
<th>ED (n = 64)*</th>
<th>ICU (n = 24)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female, No. (%)</td>
<td>30 (46.2)</td>
<td>13 (54.2)</td>
</tr>
<tr>
<td>Median age, y (IQR)</td>
<td>82 (72.5 - 86)</td>
<td>51 (35.3 - 63.8)</td>
</tr>
<tr>
<td>Cause of Death No. (%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cardiac Arrest</td>
<td>18 (28.1)</td>
<td>5 (20.8)</td>
</tr>
<tr>
<td>Intracranial Hemorrhage</td>
<td>18 (28.1)</td>
<td>6 (25.0)</td>
</tr>
<tr>
<td>Respiratory Failure</td>
<td>11 (17.1)</td>
<td>1 (4.1)</td>
</tr>
<tr>
<td>Cancer Advanced</td>
<td>6 (9.3)</td>
<td>2 (8.3)</td>
</tr>
<tr>
<td>Sepsis</td>
<td>4 (6.3)</td>
<td>1 (4.1)</td>
</tr>
<tr>
<td>Aortic Aneurysm</td>
<td>3 (4.7)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>Trauma</td>
<td>3 (4.7)</td>
<td>2 (8.3)</td>
</tr>
<tr>
<td>Burn</td>
<td>1 (3.1)</td>
<td>2 (8.3)</td>
</tr>
<tr>
<td>CVA</td>
<td>2 (3.1)</td>
<td>2 (8.3)</td>
</tr>
<tr>
<td>Other</td>
<td>1 (1.6)</td>
<td>3 (12.5)</td>
</tr>
</tbody>
</table>

Table 2: All Deaths – Decision Maker Characteristics - all Deaths.

<table>
<thead>
<tr>
<th></th>
<th>ED</th>
<th>ICU</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consultant</td>
<td>81/119 (68.1%)</td>
<td>42/43 (97.7%)</td>
</tr>
<tr>
<td>Registrar</td>
<td>33/119 (27.7%)</td>
<td>1/43 (2.3%)</td>
</tr>
<tr>
<td>Consultant and Registrar</td>
<td>5/119 (4.2%)</td>
<td>0/43 (0%)</td>
</tr>
</tbody>
</table>

Table: Time to Death - for Patients following decision to withdraw/withhold Life sustaining health care.

Figure 2: Time to Death - for Patients following decision to withdraw/withhold Life sustaining health care.

Discussion

To our knowledge this is the first study with a purpose to investigate the importance of considerations and discussions that Emergency Physicians and Intensive Care Specialists take into account when withdrawing and/or withholding life sustaining health care.

The incidence of death within this ED and ICU was 0.16% and 5.1% respectively which is consistent with national statistics and the international literature [6-8]. We also found that 57.1% of the deaths in ICU and 80.2% of deaths in the ED were preceded by a decision to withdraw and/or withholding life sustaining treatment, both rates are also consistent with the current literature [6,8].

There are a number of studies reporting differences in practice between intensive care specialists, but there are few studies in the literature comparing specialties in relation to clinical practice [3,9]. An Australian study, relating to end-of-life decisions in patients without capacity, compared legal knowledge of seven different specialists which found low rates of legal knowledge generally, however the response rates were very low [10]. A small pilot study in the US compared communication practices of Intensive Care Specialists, Emergency Physicians and Generalists and found that skill at discussing end-of-life goals was associated with initiation of palliative care (PC). Of interest was Intensive Care Specialists and Emergency Physicians were more likely to admit patients with end-stage cancer to ICU [11].

The decision to withdraw/withhold in the ICU was made almost exclusively by the intensive care specialist where as in the ED it was
made by training registrars (registrars = residents) 30% of the time. This difference could be explained by the fact ED registrars in the Australasian clinical setting do not have direct consultant oversight after-hours and therefore will be the most senior clinician making a decision. Also patients in the ICU usually have had prior senior input in relation to their management, including any withdrawal/withholding decisions, such that after-hours ICU registrars are not required to make this decision.

Both specialties rated most important the "patients' interests" when making a decision to withdraw and/or withhold treatment. The other considerations rated very important were prognosis and futility, with ICU specialists favoring prognosis and ED physicians favoring futility.

Emergency physicians rated co-morbidities and age as more important considerations. This may reflect that a broader range of factors come into play in the early stages of a presentation to the ED, whereas in ICU, the decision has moved away from these factors to focus on reversibility and futility of treatment. The other reason why they may have been considered more often by ED physicians is that the median ages of the patients in the ED sample were older.

Organ donation was rated more important by intensive care specialists, this is not surprising as ICU is the clinical setting where this occurs [3,5]. The importance of organ donation in the ED would be best investigated by a study that looked at the considerations taken into account by emergency physicians when referring patients for admission to ICU.

The study showed that ED and ICU physicians rated discussions with families as very important. The main difference was discussions with family occurred almost always in ICU but not in the ED. This could be explained for ED presentations like cardiac arrest, where next of kin are often not available by the time death has ensued. Also intensive care specialists rated inpatient team discussions as more important than emergency physicians. In the ICU subspecialty input is more likely, and ongoing and contributes to the multidisciplinary environment that exists, in contrast the nature of many acute life threatening presentations to the ED often

Table 3: Reported relative importance of factors and discussions in decision-making regarding withdrawal or withholding of treatment.
have a clear trajectory, and in other cases the time course prevents discussions from occurring.

Referral or discussion with the coroner was higher for deaths in the ICU. This is an interesting finding as it would be reasonable to assume that there had been more time for a definitive cause for death to have been established in the ICU setting compared to the ED. Over or under reporting by the relevant specialty could explain this difference. There were no referrals to the palliative care service from ICU for patients that died there. This could be explained by the fact that many of the palliative care measures are already in place in the intensive care environment and also most patients died very quickly once a decision was made. The ED referred less than 7.5% of patients to the palliative care service, which was justified by deemed imminence of death, however 70% of ED patients died after four hours with 15.9% dying greater than eight hours after a decision to withdraw/withheld was made.

Five families objected to withdrawal/withholding of treatment in the ICU, no objections were reported in the ED. This was resolved by discussions with hospital executive (three cases), Adult Guardian (one case) and in the last case the patient had a cardiac arrest and could not be revived. This highlights a conflict that can exist between a patient, their family and the provider, where limits of futility are influenced by the individual perspective and context. This is consistent with research which has shown cancer patients are willing to accept treatments for benefits much smaller than what some medical professionals may consider reasonable and also reports of families being less trusting of medical assessments [12,13].

Conclusion

This study has shown that in the majority of deaths that occurred in this ED and ICU, a decision to withdraw and/or withhold life sustain health care was made. Intensive care specialists were more likely to be involved in any withdrawal decision and provide full treatment. Patients took longer to die in the ED and could benefit from palliative care service referral.

Limitations

This study has limitations. Firstly, the study only involved a single ED and ICU unit. Secondly the numbers of patients were small. Thirdly it is possible that some answered in a way they thought would be expected or acceptable rather than reflecting reality. Fourthly, there may have been a Hawthorne effect with a change to considerations and discussions undertaken if clinicians completed the questionnaire more than once.

Authors Contribution

Richardson, PG designed the study and obtained ethics approval at the site. PGR, Widcombe N recruited patients at each site and supervised completion of questionnaires and data collection. Ibrahim Mahmoud performed data audit and analyzed the data. PGR drafted the manuscript and all authors contributed to the final article. PGR takes responsibility for the paper as a whole.

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References


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