Documentation of Do-Not-Attempt-Cardiopulmonary-Resuscitation Orders amid the COVID-19 Pandemic

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Abstract:

Introduction: The COVID-19 pandemic has brought the decision-making process regarding cardiopulmonary resuscitation (CPR) into focus. The aim of this study is to compare rates of Do-Not-Attempt CPR (DNACPR) documentation in older hospitalised patients before and during the COVID-19 pandemic.

Methods: This was a retrospective repeated cross-sectional study. Data including co-morbidities and resuscitation status was collected on 300 patients with COVID-19 hospitalised from March 1st to May 31st 2020. DNACPR documentation rates in patients aged ≥65 years with a diagnosis of COVID-19 were compared to those without COVID-19 admitted during the same period and also compared to documentation rates pre-COVID-19 pandemic (March 1st to May 31st 2019).

Results: Of 300 COVID-19-positive patients, 28% had a DNACPR order documented during their admission. Of 131 older (≥65 years) patients with COVID-19, 60.3% had a DNACPR order compared to 25.4% of 130 older patients without COVID-19 ($p<0.0001$). During a comparable time period pre-pandemic, 15.4% of 130 older patients had a DNACPR order in place ($p<0.0001$). Fifty percent of DNACPR orders were recorded within 24 hours of a positive swab result for SARS-CoV-2. Of older COVID-19-positive patients, 39.2% were referred to palliative care services and 70.2% survived.

Conclusion: The COVID-19 pandemic has prompted more widespread and earlier decision-making regarding resuscitation status. Although case-fatality-rates were higher for older hospitalised patients with COVID-19, many older patients survived the illness. Advance care planning should be prioritised in all patients and should remain good clinical practice despite the pandemic.

Keywords:
Do-not-attempt-cardiopulmonary-resuscitation orders, COVID-19, older people, palliative care

Key Points:

- The prevalence of DNACPR order documentation in older patients with COVID-19 was 2.4 fold higher than in those without.
- Case fatality rates were higher for older hospitalised patients with COVID-19 but over 70% survived this illness.
- Advance care planning should be prioritised and should remain good clinical practice despite the COVID-19 pandemic.

Introduction

Consideration of cardiopulmonary resuscitation (CPR) and Do-Not-Attempt Cardiopulmonary Resuscitation (DNACPR) is considered an important part of advance care planning and good clinical practice [1]. Advance care planning allows individuals to have more control over their care, to avoid potentially futile interventions and to have better care and symptom relief in end-of-life situations. Although a DNACPR order should not equate to 'doing nothing' and all other appropriate care should be given, discussions regarding DNACPR are often a source of ethical concern. Studies have shown that DNACPR orders are frequently over-interpreted to mean withholding of other treatments beyond resuscitation and this may lead to 'therapeutic nihilism' [2][3].

The Health Service Executive (HSE) in Ireland, as in many other countries, published up-dated guidance regarding cardiopulmonary resuscitation and Do-Not-Attempt-Resuscitation (DNAR) decision-making during the Covid-19 pandemic [1][4]. This guidance emphasises that the fundamental principles of good clinical practice remain the same and that there should be no discrimination for or against people based on age, disability, place of residence or the presence or suspicion of COVID-19 [1].

The primary aim of this study is to audit the prevalence and timing associated with documentation of a DNACPR order in patients aged 65 years or over receiving in-hospital care and diagnosed with COVID-19 in an academic teaching hospital in Ireland between 1st March 2020 and 31st May 2020. Secondary objectives of the study are to compare the prevalence of DNACPR orders in that population with the prevalence of DNACPR orders in two other populations: (i) patients aged ≥65 years who were hospitalised during the same time period but who did not have a diagnosis of COVID-19 (ii) patients aged ≥65 years who were hospitalised one year previously prior to onset of the pandemic.

Methods

This was a retrospective repeated cross-sectional study conducted in a tertiary referral centre located in the north inner city of Dublin, Ireland [5].

This study utilised data from three sources:

1. The ANTICIPATE Study database [6]
2. Patients' electronic hospital records
3. The Hospital In-Patient Enquiry (HIPE) Reporting Database

The ANTICIPATE study database comprises data on demographic and clinical information, treatment and outcomes for 300 patients admitted to the hospital between March 1st and May 31st 2020 and who were diagnosed with COVID-19 [6]. The HIPE database comprises demographic, clinical and administrative data on discharges from, and deaths in, acute public hospitals nationally.

Demographic and clinical data relevant to this study was extracted from the ANTICIPATE database in order to create the 'ANTICIPATE DNACPR study database'. Data on placement and timing of DNACPR orders were extracted from the participant electronic records and entered into this database. A DNACPR order was considered to be in place if electronically signed on the admission in question only. The proportion of COVID-19 positive patients aged ≥65 years was calculated and the prevalence of DNACPR orders in these participants was recorded.

Outcomes recorded included, ICU admission, referral to Specialist Palliative Care (SPC) services and in-hospital deaths.

The HIPE database was utilised to generate two further anonymised lists of patients without a diagnosis of COVID-19. One list comprised all 1277 patients ≥65 years who were admitted under a medical service in our hospital between March 1st and May 31st 2020 without a diagnosis of COVID-19. The other list comprised all 1721 patients ≥65 years who were admitted under a medical service between March 1st and May 31st 2019. For each list, simple random selection was then used to generate a sample size of 130 patients, similar to the total number of patients aged ≥65 years enrolled in ANTICIPATE. Finally, data on placement of DNACPR orders in these groups was extracted from electronic patient records.

Analysis:

Data analysis was carried out using Stata ® (version 15). For patients aged ≥65 years the proportion of those who had a DNACPR order documented was calculated. Differences in baseline characteristics of those with a DNACPR order documented versus not were analysed.

Consent and ethics:

ANTICIPATE was approved by the hospital's Research Ethics Committee (8th April 2020; reference 1/3782141). Review of HIPE data was approved by the hospital's Clinical Audit and Effectiveness Committee (reference CA20-062).

Results

Demographics and clinical characteristics of the population with COVID-19:

On analysis of 300 patients who were treated for COVID-19 between March 1st and May 31st 2020, 131 (46.6%) patients were aged ≥65 years. Approximately one-third were nursing home residents (36.6%) and had a diagnosis of cognitive impairment (34.4%). Nearly all (96.2%) were classified as having multi-morbidity. The baseline characteristics of the patients aged ≥65 years with a diagnosis of COVID-19 are shown in Table 1.

Prevalence of DNACPR documentation:

From the ANTICIPATE dataset of patients hospitalised with COVID-19 (n=300), 84 (28%) had a DNACPR order completed during their admission. Of the 131 patients aged ≥65 years, 79 (60.3%) had a DNACPR order in place. Five patients (3%) aged <65 years, had a DNACPR order in place.

Older patients with COVID-19 were significantly more likely to have a DNACPR order documented compared to those without COVID-19 at the same time period (60.3% versus 25.4%; p<0.0001). The prevalence of DNACPR documentation was significantly higher in older patients without COVID-19 in 2020 compared to an identical time period one year previously (25.4% versus 15.4%; p<0.05).

Timing of DNACPR documentation:

Of the 79 patients aged ≥65 years with COVID-19, a DNACPR order was completed in 13 patients (16%) prior to the diagnosis. In those who had a DNACPR order documented after COVID-19 was diagnosed, the median time between a positive swab result for SARS-CoV-2 and order completion and was 1 day (range 0 to 45). Thirty-seven (47%) DNACPR orders were recorded in the electronic health record within 1 day of COVID-19 diagnosis.

Outcomes of care:

Of the 300 patients enrolled in ANTICIPATE, there were 46 (15.3%) in-hospital deaths. Thirty-nine patients aged ≥65 years died (29.8%) compared to 7 (4.2%) patients aged <65 years. Of the older group with a DNACPR order documented who died in hospital (n=37), 27 (73%) were referred to SPC services. Forty-two (53%) patients ≥65 years diagnosed with COVID-19 and with a DNACPR order documented survived.

Of 130 patients ≥65 years without COVID-19, 7 (5.4%) died. This death rate was identical to that observed in the 130 patients ≥65 years admitted in 2019 (7 deaths; 5.4%).

Table 1: Baseline characteristics and outcomes of hospitalised patients with COVID-19 aged ≥65 and bivariable analysis of variables associated with DNACPR order documentation

	All patients aged ≥65 (n=131)	**DNACPR group (n=79)**	**Non-DNACPR group (n=52)**	**P value**
Demographics				
Mean age	77.8 ± 7.7	80.4 ± 7.6	73.9 ± 6.1	<0.0001
Age 65-74 yr	50 (38.2%)	23 (29.1%)	27 (51.9%)	0.01
Age 75-84 yr	53 (40.5%)	29 (36.7%)	24 (46.2%)	0.28
Age ≥85 yr	28 (21.4%)	27 (34.2%)	1 (1.9%)	< 0.0001
Female Sex	71 (54.2%)	45 (57%)	26 (50%)	0.43
Nursing Home Resident	48 (36.6%)	40 (50.6%)	8 (15.4%)	< 0.0001
Co-morbidities				
Cardiovascular Disease	88 (67.2%)	55 (69.6%)	33 (63.5%)	0.47
Cognitive Impairment (Dementia or MCI)	45 (34.4%)	38 (48.1%)	7 (13.5%)	< 0.0001
Respiratory Disease	42 (32.1%)	30 (38%)	12 (23.1%)	0.08
Chronic Renal Impairment	28 (21.4%)	21 (26.6%)	7 (13.5%)	0.07
Diabetes Mellitus	26 (19.8%)	16 (20.3%)	10 (19.2%)	0.88
Cerebrovascular Disease	17 (13%)	12 (15.2%)	5 (9.2%)	0.35
Current or Prior Malignancy	21 (16%)	10 (12.7%)	11 (21.2%)	0.20
Multi-Morbidity (≥2 Medical	126 (96.2%)	78 (98.7%)	48 (92.3%)	0.06

Conditions [7])				
Outcomes				
Palliative Care Referral	31 (23.7%)	31 (39.2%)	0 (0%)	<0 .0001
ICU Admission	9 (6.9%)	3 (3.8%)	6 (11.5%)	0.09
Deaths	39 (29.8%)	37 (46.8%)	2 (3.8%)	<0 .0001

Discussion

Our study highlights the changes in documentation of DNACPR orders that occurred at the beginning of the COVID-19 pandemic. We found that there was a significant increase in DNACPR documentation in patients aged ≥65 years with and without COVID-19 during the initial outbreak period. The magnitude of increase in documentation of DNACPR in older patients with COVID-19 was striking and was over two-fold higher than documentation in older patients without COVID-19 and four-fold higher compared to 2019. The timing of these decisions occurred very early on suggesting that this illness was considered serious and life-threatening, stimulating early consideration of outcomes. Taken together, our findings of more prevalent and early documentation of decisions regarding CPR reflect the immense impact of COVID-19 on usual practice.

The high referral rate to our specialist palliative care (SPC) service (39.2%) demonstrates effective integration of palliative care into service provision and ensures a focus on quality of life despite the presence of serious illness. Almost 70% of patients who died in hospital with COVID-19 were referred to the SPC service, indicating a role for SPC in the care of patients dying with COVID-19. However, it is also worth noting that that a high proportion of patients with DNACPR orders in place survived (53%). Indeed, 4% of them were admitted to ICU, suggesting that therapeutic nihilism was not associated with a DNACPR order being in place.

DNACPR decisions were associated with better end-of-life experiences alongside sensitive discussions and shared decision-making in a report on DNACPR decisions before and during the Coronavirus pandemic [8]. This report also highlighted that people had worse experiences when inappropriate or unwanted CPR was attempted or when communication of DNACPR decisions was poor or non-existent.

We recognise a number of limitations of our study. In our institution, DNACPR orders are completed on the electronic health record. However, the documentation is only completed when a DNACPR order is put in place, and there is no electronic documentation of advanced care planning discussions where the outcome is that it is agreed that a DNACPR order should not be put in place. Therefore, we cannot infer from our data whether there was a change in the frequency with which advance care planning discussions were held. On comparison of DNACPR documentation rates between groups with and without COVID-19, and to before the pandemic, baseline co-morbidities and admission details were not recorded in the HIPE groups. We note that the differences in prevalence of DNACPR documentation could arise from this but the significant increase of documentation in COVID-19 patients remains striking.

Our National and institutional DNACPR policy encourages discussion of all decisions with patients and/or families however this information is frequently filled out on a printed DNACPR form and was not available to us electronically. Therefore ‘patient preferences’ as a factor associated with DNACPR was not captured. We do however recognise the importance of these discussions in determining a person’s goals and preferences regarding resuscitation [1].

Further research is needed to provide insight into the behavioural characteristics associated with changes in DNACPR practice, the processes of decision-making and the personal impact on patients and families. It is essential that DNACPR decisions are made in ways that protect human rights and meet the individual needs of patients even during times of maximum challenge to healthcare systems.

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