



Original Article

Patients' characteristics associated with the decision of “do not attempt cardiopulmonary resuscitation” order in a Swiss hospital



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ABSTRACT

Background: According to Swiss legislation, do not attempt cardiopulmonary resuscitation (DNACPR) order can be made at any time by patients only, unless the resuscitation is considered as futile, based on the doctors' evaluation. Little is known about how this decision is made, and which are the factors influencing this decision. **Methods:** Observational, cross-sectional study was conducted between March and May 2013 on 194 patients hospitalized in the general internal medicine ward of a Swiss hospital. The associations between patients' DNACPR orders and gender, age, marital status, nationality, religion, number and type of comorbidities were assessed.

Results: 102 patients (53%) had a DNACPR order: 27% issued by the patient him/herself, 12% by his/her relatives and 61% by the medical team. Patients with a DNACPR order were significantly older: 80.7 ± 10.8 vs. 67.5 ± 15.1 years in the “with” and “without” DNACPR order group, respectively, $p < 0.001$. Oncologic disease was associated with a DNACPR order issued by the medical team (37.5% vs. 16.9% in the “with” and “without” DNACPR order group, respectively, $p < 0.05$). Being protestant was associated with a DNACPR order issued by the patient (57.9% vs. 25.9% in the “with” and “without” DNACPR order group, respectively $p < 0.01$).

Conclusions: Over half of the patients admitted to a general internal medicine ward had a DNACPR order issued within the first 72 h of hospitalization. Older age and oncologic disease were associated with a DNACPR decision by the medical team, while protestant religion was associated with a DNACPR decision by the patient.

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1. Introduction

Do not resuscitate (DNR) order was introduced by the medical community to assist physicians in the decision-making process when the patient has a cardiac or respiratory arrest. This order is meant as an advanced directive for patients who do not wish to receive CPR at the moment of cardiac or respiratory arrest. Although the majority of hospitals have had DNR orders in existence for more than 30 years, there is still confusion regarding their content and application [1–3]. Moreover, several studies showed that a DNR order changes the medical treatments apart from the event of cardiopulmonary arrest [3–6].

In the last years, the denomination has changed from “do not resuscitate” (DNR) to “do not attempt to resuscitate” (DNAR) and currently to “do not attempt cardiopulmonary resuscitation” (DNACPR), trying to make it clearer that this decision concerns only the situation of a

cardiopulmonary arrest, not other medical possibilities (ICU admissions, antibiotics, dialysis, etcetera...) [6].

Numerous publications exist about the difficulties encountered by a medical team faced with the DNACPR order [7,8]. In Switzerland, the first directives were published in 2008 and reviewed in 2013 to conform with changes in Swiss legislation, where more autonomy is given to the patient's legal representative, when the patient is unable to make a decision [9]. Application of a DNACPR order constitutes a therapeutic decision. As well as with every other treatment, discussion with the patient is mandatory and he/she must play a central role in the decision-making process [10]. When patients are able to decide or have clearly determined their wishes, there is a general ethical and legal consensus that those decisions should be respected [11].

Previous studies documented that the rate of DNACPR order among patients is variable: 8.6 to 24% for hospitalized patients [6–8,12–15] and up to 40% in nursing homes [16]. Several factors are associated with the DNACPR order: older age [7,12,16,17], presence of several comorbidities [12,17–19], oncologic status [7,12,19], psychiatric disease [7], poor quality of life [7,17] and poor prognostic [7,17]. Despite the common consensus about patient implication in the decision of establishing a DNACPR order, the prevalence of the discussion of this order with patients and/or relatives varied considerably (10–84%) according to the country [15,20,21].

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Although many Swiss hospitals have mandatory instructions to obtain a reanimation code upon admission to the hospital, little is known about how this decision is made, and which are the main factors influencing this decision. Thus, we aimed to assess the prevalence and the determinants of DNACPR orders in a Swiss university hospital.

2. Materials and methods

The study was conducted between the 25th of March and the 5th of May 2013 in the Department of General Internal Medicine at the Lausanne University hospital (CHUV), Switzerland, after approval by the local Human Research Ethics Committee.

2.1. DNACPR orders

According to the directives of our hospital, a DNACPR order has to be decided as soon as possible at the beginning of the hospitalization. Unless the CPR is not medically appropriate, the patient or his/her legal representative should be asked for his/her preferences. The medical “futility” is defined as no chance of survival without major neurological consequences or if the patient will be dying in the coming days or weeks, based on the clinical signs and the doctors' expertise. The medical decision is done by the resident and the chief-resident together. The forms, where CPR or DNACPR order are documented by residents, and the electronic medical records where patients' characteristics are documented, were reviewed by the two principal investigators within 72 h after admission during 6 weeks ($n = 194$ patients). We excluded patients who were first admitted in other departments or in step down units, so that discussions led by another medical team had no interference. We collected from the medical forms whether or not a DNACPR order was written and whether or not the decision was taken by the patient, by his or her relatives or by the medical team. We choose 72 h, to include all week's days and to analyse the initial decision of DNACPR at the beginning of the hospitalization.

2.2. Other data

The other data were also gathered from the medical forms and included age, gender, marital status, nationality (Swiss, European and other), religion (protestant, catholic and other), place of living (nursing home or home for disabled adults versus private residence), number and type of pathologies. Marital status was defined as living in couple (married or living with a partner) and other (single, divorced or widowed). The types of comorbidities included all pathologies that could influence the decision to resuscitate or not. Previous medical conditions were classified into cardiovascular disease (including stroke); pulmonary disease; oncologic disease, including all patients with active cancer or cancer in the previous 5 years whatever the extension of the illness; psychiatric disease; dementia; renal disease and cirrhosis. The types of comorbidities were chosen according to the literature [7,12,16,17,19] and the clinical and demographic data were chosen because based on clinical experience that they could influence the resuscitation order in the patient's or in the medical team's point of view. The outcome of the patients during the hospitalization was reviewed 3 months after the inclusion.

3. Statistical analysis

Statistical analysis was conducted using version 12.1 of Stata (Stata Corp, College Station, TX, USA). Descriptive results were expressed as mean \pm standard deviation (SD) for normally distributed quantitative data, as median (25th–75th percentile) of non-normally distributed quantitative data or as number of participants (percentage) for qualitative data. Between-group comparisons were performed using Student's *t*-test or Kruskal–Wallis non-parametric for quantitative data and chi-square or Fisher's exact test for qualitative data. Multivariate analysis

was conducted using logistic regression and the results were expressed as odds ratio (OR) and 95% confidence interval (CI). Statistical significance was defined for $p < 0.05$.

The relationship between DNACPR orders and patient characteristics (age, gender, nationality, marital status, number and types of comorbidities) was investigated by bivariate and multivariate analysis. The same analysis was also conducted for two groups, one group with DNACPR orders decided by patients and their relatives and another with DNACPR orders decided by medical team.

4. Results

4.1. Sample characteristics

Characteristics of the patients included are summarized on Table 1. The sample was composed of 194 patients (108 women and 86 men, mean age 74.4 ± 14.6 years). There were 14 patients in age group 30–49 and 19 patients in age group 50–59 years. The most frequent pathology was cardiovascular, followed by cancer and lung disease; conversely, less than one out of twenty patients presented with cirrhosis. There was no patient included in palliative care unit prior to hospitalization.

4.2. Prevalence of the DNACPR

The frequency of the DNACPR order given in the 72 h after admission was 53% (102 patients); among these DNACPR orders, 27% were issued by patients themselves (28 patients), 12% by relatives (12 patients) and 61% by the medical team (62 patients) as shown in Fig. 1. Whatever the resuscitation order's decisions, 66% (66 CPR and 69 DNACPR orders) were decided by the medical team, 27% (24 CPR and 28 DNACPR orders) by patients themselves and 7% (2 CPR and 12 DNACPR orders) by

Table 1
Main characteristics of the sample, overall and by gender.

| | Women | Men | All | p-Value* |
|---------------------------|-----------------|-----------------|-----------------|--------------------|
| N | 108 | 86 | 194 | |
| Age (years) | 74.8 \pm 15.1 | 74.1 \pm 13.9 | 74.4 \pm 14.6 | 0.74 |
| Age group (%) | | | | |
| 30–59 | 21 (19.4) | 12 (14.0) | 33 (17) | |
| 60–69 | 13 (12.0) | 17 (19.8) | 30 (15.5) | |
| 70–79 | 16 (14.8) | 19 (22.1) | 35 (18.0) | 0.18 |
| 80–89 | 47 (43.5) | 27 (31.4) | 74 (38.1) | |
| 90+ | 11 (10.2) | 11 (12.8) | 22 (11.3) | |
| Marital status (%) | | | | |
| Other | 75 (69.4) | 37 (43.0) | 112 (57.7) | <0.001 |
| Living in couple | 33 (30.6) | 49 (57.0) | 82 (42.3) | |
| Nationality (%) | | | | |
| Swiss | 82 (75.9) | 61 (70.9) | 143 (73.7) | |
| European | 16 (14.8) | 18 (20.9) | 34 (17.5) | 0.57 |
| Other | 10 (9.3) | 7 (8.1) | 17 (8.8) | |
| Religion (%) | | | | |
| Roman catholic | 37 (34.3) | 37 (43.0) | 74 (38.1) | |
| Protestant | 45 (41.7) | 28 (32.6) | 73 (37.6) | 0.38 |
| Other | 11 (10.2) | 12 (14.0) | 23 (11.9) | |
| Unknown | 15 (13.9) | 9 (10.5) | 24 (12.4) | |
| Number of comorbidities | 2 [1–3] | 2 [1–3] | 2 [1–3] | 0.63 [§] |
| Type of comorbidities (%) | | | | |
| Cardiovascular | 52 (48.2) | 42 (48.8) | 94 (48.5) | 0.92 |
| Pulmonary | 21 (19.4) | 20 (23.3) | 41 (21.1) | 0.52 |
| Oncologic | 21 (19.4) | 30 (34.9) | 51 (26.3) | 0.02 |
| Psychiatric | 20 (18.5) | 13 (15.1) | 33 (17.0) | 0.53 |
| Dementia | 21 (19.4) | 12 (14.0) | 33 (17.0) | 0.31 |
| Renal insufficiency | 24 (22.2) | 14 (16.3) | 38 (19.6) | 0.30 |
| Cirrhosis | 2 (1.9) | 7 (8.1) | 9 (4.7) | 0.08 ^{§§} |

Results are expressed as mean \pm standard deviation, as median and (25th–75th percentile) or as number of participants (percentage). *Between gender comparisons using Student's *t*-test or Kruskal–Wallis non-parametric test ([§]) for quantitative data and chi-square or Fisher's exact test (^{§§}) for qualitative data.

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