Palliative extubation: case analysis in an Intensive Care Unit

Extubação paliativa: análise de casos em uma Unidade de Terapia Intensiva

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Artigo Original • Original Paper
O Mundo da Saúde, São Paulo - 2017;41(3):385-394

Abstract

Current technological advancements have allowed for the prolongation of the dying process, especially in Intensive Care Units (ICU). This has increased the need for decisions on the limitation of therapeutic effort (LTE), such as the use of palliative extubation that, although difficult from an emotional standpoint, has legal and ethical justifications, and has increased family acceptance. The objective was to evaluate the clinical and demographical profile of patients submitted to palliative extubation (PT) in the ICU of the University Hospital of the Universidade Federal de Santa Catarina (HU/UFSC), Brazil. This was a historical cohort whose data were obtained from forms filled out by critical care doctors from the Hospital Death Commission at the HU/UFSC. Patients submitted to LTE that died between January 2011 and December 2014 were included in the study. The use of PT and clinical and epidemiological data were collected. LTE was indicated in 374 (53.8%) patients, with 23 (6.1%) receiving PT. Average age of patients undergoing PT was 73.8 years; 10 patients were over 60, and 9 were over 80 years of age. Ten (43.4%) patients had been previously in the ICU. The average time from checking in at the ICU and extubation was 4.4 days, and between extubation and death it was 2.5 days. Neurological disease was the main cause of death of patients subjected to PT. All family members were aware of the extubation. Family members from 2 families witnessed the extubation. Morphine was the most common analgesic prescribed. It is concluded that patients submitted to PT were older, with neurological diseases, and the average time from extubation to death was 2.5 days

Keywords: Palliative care. Terminally ill. Airway extubation. Withholding treatment. Medical futility.

Resumo

O desenvolvimento tecnológico do mundo atual tem permitido o prolongamento do morrer, principalmente em unidades de terapia intensiva (UTI). Torna-se crescente a necessidade de decisões de limite de esforço terapêutico (LET), do qual se destaca a extubação paliativa (EP), que embora difícil de ser aceita do ponto de vista emocional, tem respaldo ético-legal e aumenta a satisfação familiar. O estudo teve como objetivo avaliar o perfil clínico-demográfico dos pacientes extubados paliativamente (ExPl) na UTI do HU/UFSC. Trata-se de coorte histórico, cujos dados foram coletados através das fichas preenchidas por médicos intensivistas que constituem a Comissão de Óbito da instituição. Foram incluídos os pacientes que morreram na UTI/HU/UFSC, após indicação de LET, entre janeiro/2011 e dezembro/2014. Foram selecionados os pacientes que foram ExPl, sendo anotados seus dados clínicos e epidemiológicos. LET foi apontado em 374 (53,8%) pacientes, sendo 23 (6,1%) ExPl. A média da idade dos ExPl foi de 73,8 anos, 10 tinham mais de 60 e 9 mais de 80 anos. Dez (43,4%) pacientes já haviam sido internados previamente em UTI. O tempo médio entre a internação-extubação foi 4,4 dias e entre extubação-morte foi de 2,5 dias. Doença neurológica foi a principal causa da morte dos pacientes ExPl. Todos os familiares estavam cientes da EP. Familiares de 2 pacientes acompanharam a EP. Morfina foi a medicação analgésica mais prescrita. Concluiu-se que os pacientes que foram ExPl eram mais idosos, acometidos preferencialmente por doenças neurológicas e o tempo médio entre a EP e óbito foi de 2,5 dias.

Palavras-chave: Cuidados paliativos. Doente terminal. Extubação. Suspensão de tratamento. Futilidade médica.

DOI: 10.15343/0104-7809.20174103385394

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The section "Bioethics in the World of Health" was created to include works of great relevance in the area of Bioethics and Health. This edition addresses two controversial and current issues

A seção "Bioética no Mundo da Saúde", foi criada para comportar trabalhos de grande relevância na área da Bioética e da Saúde. Esta edição, aborda dois polêmicos e atuais temas.

INTRODUCTION

The aging of a population and the greater control of chronic degenerative diseases are factors related to the change in the profile of patients hospitalized in Intensive Care Units (ICUs), increasing the need for Palliative Care (PC) in the sectors of critical patient care.[1] A study that corroborates with this assertion evaluated 61 critically ill patients admitted to an emergency ICU, and concluded that patients had a "reduced benefit" with intensive care and would be benefited if they had received preferential PC.[2]

The prognostic evaluation of critically ill patients has been increasingly importance in therapeutic decisions.[3] Discussions are ongoing about the fragile patient, a syndrome characterized by the loss of physiological and cognitive reserves that confer vulnerability toward adverse outcomes,[4] and on the chronically ill patient, it is a condition that affects 5 to 10% of patients who survive a catastrophic illness and who require prolonged mechanical ventilation. These diseases, which are increasingly prevalent in ICU's, resulting in high hospital morbimortality and a substantial increase in treatment costs.[5]

In these cases, an intense treatment with a therapeutic vision will lead to dysthanasia, with consequent prolongation of dying and increased suffering for all involved in the process. This reality requires the intensivist to make end-of-life decisions and especially the evaluation of the refusal or suspension of therapies considered futile or useless, making it necessary for the intensivist physician to receive training in palliative medicine.[5,6]

With the intention that PC would be implemented in ICU's, members of the Southern Cone Life Termination Committee, made up of health professionals from the Brazilian, Uruguayan and Argentine Societies of Intensive Care Medicine, have elaborated phases for palliative care in these units. Phase 1 is considered as a clinical condition in which the team perceives a greater possibility for recovery than for the outcome of death or for the condition of irreversibility. It judges that, according to beneficence and autonomy, priority is given to the treatment that seeks healing / restoration. At this stage, PC will be provided to relieve discomfort from the disease and intensive treatment (death unlikely). Phase 2 is a clinical condition in which the team perceives a lack of responses or an insufficient response to the resources used, with an increasing tendency towards either death or irreversibility.

Establishing the consensus among staff, patient, and family, priority then becomes the best quality of life possible, and care that modifies the illness can be offered when deemed appropriate by staff and patient / family (death expected in days, weeks, or months). In Phase 3 the team recognizes the irreversibility of the disease and imminent death, accepting the outcome of death. The PC becomes exclusive, and all measures introduced seek the best possible quality of life and the comfort of the patient and his / her family members (expected death expected in hours or days).[7]

Therefore, in this last phase, it becomes important that decisions of limitation of therapeutic effort (LTE) be made that will cover refusal or withdrawal of therapies. It should be emphasized that it is more difficult for physicians to opt for suspension than for refusal of therapies. Likewise, the decision to refuse / suspend therapy has a direct link with cultural factors, and the most frequently pointed out are the difficulty in withdrawing diet, hydration, and invasive ventilatory assistance.[8]

In Brazil, there is a definition from the Federal Medical Council regarding PC and LTE. It is defined in the code of medical ethics, more specifically in the sole paragraph of article 41 that "*In cases of incurable and terminal illness, the physician should offer all palliative care available without undertaking useless or obstinate diagnostic or therapeutic actions, always taking into consideration the expressed intention of the patient or, in its impossibility, that of their legal representative* ". It is important to add that resolution 1805/2006 of this council defines that "*it is permissible for the physician to limit or suspend procedures and treatments that prolong the life of the ill patient, guaranteeing him the necessary care to alleviate the symptoms that lead to suffering, from the perspective of complete assistance, respecting the will of the patient or their legal representative*," and this

resolution was considered constitutional by the federal judge Roberto Luis Luchi Demo, in a decision published in the Diário Oficial da União of November 28, 2006.[9]

Palliative extubation (PE) is the withdrawal of the tracheal tube and mechanical ventilation (MV) or the reduction of ventilator parameters of those individuals whose curative/restorative therapeutic options have been exhausted, and for whom death is expected to occur in a short period of time.

The withdrawal of the MV is described as a "process" and, as such, the clinical picture of the patient must be taken into consideration and whether the patient will not present discomfort or suffering with extubation. The possible complications of this act and the treatments to be used to correct them should be evaluated.[10] It is common for withdrawal of therapies considered futile or useless to be multiple. In general, the most frequently limited therapies are vasopressors and dialytic methods. Drugs that are almost never suspended or refused are sedatives and analgesics.[11]

In PE, as in all therapies instituted in the ICU, multiprofessional work is paramount. The professions most closely involved in this procedure are medicine, nursing and physiotherapy. It is up to the physician to decide therapies, predict complications, and institute medication that avoid these complications and that allow for the patient's well-being.

The role of the physiotherapist and the nurse is directly related to some of the stages of MV withdrawal, especially in the phases where there is a reduction of ventilator parameters, alteration of ventilatory modality, and extubation of this patient. The importance of proper communication and continuation with the patient's family is added. Although there are reports in the literature that PE is associated with improvement in satisfaction and with the decrease of family depression, there are still difficulties for the implantation of this procedure in the ICU's.[12-16]

On the other hand, few studies to date have been devoted to the analysis of patients in phase 3 under exclusive PC in the ICU's, and no reports of palliative extubation were found in Brazil. In view of the aforementioned statement, this study aimed to analyze, in a descriptive way, the cases of patients who underwent palliative extubation in the ICU of a University Hospital of Santa Catarina.

METHODS

This was a retrospective, observational, descriptive cohort study with a quantitative approach, that was performed at the HU/UFSC ICU in Florianópolis, Santa Catarina. This study is part of a line of research whose project was approved on April 13, 2015 by the Human Research Ethics Committee of UFSC, under number 426.572.

Data were collected through information obtained from death certificates filled out by members of the Hospital Death Commission (HDC). Two intensive care physicians are responsible for evaluating and completing the forms of patients who die in the ICU. These professionals were consulted and they permitted the use of these files.

The death certificates of all patients who died in the ICU/HU/UFSC in the period between January 2011 and December 2014 were included in the sample, and the files of those for whom LTE was recommended were selected, and patients with palliative extubation were also selected. PE was considered as withdrawing the invasive ventilatory assistance and the orotracheal tube from the patient who was under exclusive palliative care (phase 3), and for whom death was expected.

The clinical and epidemiological data of patients submitted to PE were noted, highlighting the time from extubation to death, as well as the cause of death according to the death certificate.

The causes of death were grouped as follows: septic shock, multiple organ failure, respiratory failure, neurological disorder (stroke and post-anoxia encephalopathy) and cardiologic dysfunction - cardiorespiratory arrest (CRA) and acute pulmonary edema. It was also observed whether the patient's death was preceded by the order of non-resuscitation in the case of CRA, if the family was aware of the terminality, and if the family was present on the day and time of death.

Because it was a descriptive analysis of few cases, the data did not receive statistical treatment, and only measures of variability were verified.

RESULTS

During the study period, 55,990 patients were hospitalized at HU/UFSC. Of these, 2,887 were admitted to the ICU. In the same period, 1864 patients died throughout the hospital, with 695 (37.2%) of those deaths being in the ICU, where the overall mortality rate was 24.1%. Of the patients who died in this unit, 374 (53.8%) received preferential or exclusive PC, with some type of LTE. Of these, 23 (6.1%) were submitted to PE; 4 in 2011, 11 in 2012, 2 in 2013, and 6 in 2014. It is noteworthy that in 2013, 2 patients were effectively extubated and 2 other cases had been decided to extubate, however the patients died before the method was performed. Of the 23 patients evaluated, 10 (43.4%) had already been admitted to the ICU in other hospitalizations. All family members were aware of the patient's terminal condition. In all the cases studied, the patients were under exclusive PC, with some form of LTE, with all medication being present for the control of symptoms, and, in the evolutions, with a clear order of non-resuscitation in case of cardiorespiratory arrest (CRA).

Table 1 shows the clinical and demographic characteristics of patients submitted to PE.

Morphine was the most commonly used analgesic medication in the last 48 hours of life of patients submitted to PE, which occurred in 15 (65.21%) patients. The other prescribed sedatives or analgesics were tramadol alone (n = 2), propofol alone (n = 2), fentanyl and propofol combined (n = 2), fentanyl and midazolam combined (n = 1), and midazolam and propofol combined (n = 1).

Table 2 shows the cause of death declared in the death certificate of the patients, related to the average time between extubation and their death. It is noteworthy that in 10 (43.5%) patients the cause of death reported was Neurological Disorder.

In 8 cases (34.7%), in addition to PE, all other supportive therapies employed, such as vasoactive drug, enteral/parenteral nutrition, hemodialysis, and antibiotics were suspended. The causes of death found on the death certificate of these 8 patients were neurological disorder (n = 4), multiple organ and system failures (n = 2), respiratory failure (n = 1), and septic shock (n = 1). This group presented an average of 4.7 days, with a maximum of 9.6 days between extubation and death.

The individual relationship between the cause of death, age, time of hospitalization to extubation, and time to death after palliative extubation is shown in Table 3.

Table 1 – Clinical-demographic characteristics of patients who underwent palliative extubation. Florianópolis, SC, 2011-2014.

Clínical-Demographic Characteristics	Patients (N=23)
Gender	
Masculine	11 (47.8%)
Feminine	12 (52.2%)
Average Age (years)	73.8 years ± 11.3
<60	4

to be continued...

...continuation - Table 1

60-79	10
≥80	9
Avg. Hospitalization Time in ICU until Extubation (days)	4.4 days
Time between extubation and death	
Mean	2.5 days
Minimum	5 minutes
Maximum	9.6 days
Family Awareness of extubation	
Yes	23
No	0
Family presence during extubation	
Yes	2
No	21

Table 2 – Cause of death indicated in the death certificate and the time between extubation and death of the patients. Florianópolis, SC, 2011-2014.

Cause of Death	Cases (%)	Average Time (minimum-maximum) in hours, until death after extubation
Neurological Disorder	10 (43.5%)	45.3 (0.08 - 142)
Multiple Organ and System Failure	6 (26.1%)	23.7 (1.5 - 58)
Respiratory Failure	3 (13%)	47.7 (0.4 – 136.5)
Septic Shock	2 (8.7%)	122.5 (13 – 232)
Cardiac Dysfunction	2 (8.7%)	189 (188 – 190)

Table 3 – Relationship between cause of death, age, length of stay until extubation, and time to death after PE. Florianópolis, SC, 2011-2014.

Patient	Cause of death	Age	Hospitalization time until extubation (days)	Time until death after palliative extubation	
				hours	days
1	Respiratory Failure	88	<1	136.5	5.6
2	Multiorgan Failure	91	11	45.5	1.89

to be continued...

...continuation - Table 2

3	Cardiac Dysfunction	81	2	188	7.8
4	Multiple Organ Failure	68	2	54	2.25
5	Neurological Disorder	71	7	20.5	0.8
6	Respiratory Failure	82	<1	6.25	0.2
7	Neurological Disorder	79	5	80	3.33
8	Septic Shock	81	26	13	0.54
9	Multiple Organ Failure	53	2	58	2.41
10	Respiratory Failure	82	<1	0.4	
11	Neurological Disorder	71	1	101.5	4.2
12	Neurological Disorder	84	<1	28	1.16
13	Neurological Disorder	79	<1	1	0.04
14	Neurological Disorder	64	4	77.2	3.2
15	Neurological Disorder	75	2	0.08	
16	Septic Shock	87	2	232	9.66
17	Multiple organ Failure	85	7	27	1.12
18	Multiple organ Failure	59	<1	11	0.45
19	Neurological Disease	56	13	1	0.04
20	Cardiac Dysfunction	49	5	190	7.91
21	Multiple Organ Failure	70	<1	1.5	0.06
22	Neurological Disorder	76	7	2	0.08
23	Neurological Disorder	68	5	142	5.91

DISCUSSION

In this study, 53.8% of the patients who died in the ICU/HU/UFSC received a palliative approach preferentially, being decided by some type of LTE. However, the decision for PE was infrequent. When compared to the total number of deaths in the unit, PE was only 3.35%. This index was 6.1% when only those patients who received some type of LTE were evaluated. It should be noted that the non-performance of cardiorespiratory resuscitation maneuvers was not noted as LTE in this study.

There is a great variability among the ICU's with regard to LTE decisions,[17] a fact that is related to regional and cultural factors. A study carried out in France showed that in 584 (52%) of 1132 patients who died, there was some type of LTE involved, with more refusal to introduce new therapies than withdrawal of prescribed treatments.[18] This is a worldwide reality. It can be inferred that it is difficult for the physician to decide to withdraw therapies, which may be mistaken for direct interference in directing

death. Similar results were found in this study. It is added that withdrawal of ventilatory support is one of the most difficult decisions for the physician. In Christian civilizations, the idea of death is associated with the image of Christ's last breath. Thus, with a deep-seated culture, withdrawal of a ventilatory support system may appear to lead to death and increased patient suffering. This is a misperception because, as pointed out in several studies, if PE is adequately indicated and performed with technical excellence, it can improve patient's comfort and decrease the family members' stress.[16]

Mark et al.[17] identified that LTE decisions occur more commonly for patients with brain injuries and that the patient's previous will or the appointment of an administrator are poorly identified. It should be emphasized that in Brazil, the Federal Medical Council approved in 2012 Resolution 1995 which deliberates on Anticipated Directives of Will, considered as the set of wishes, previously, and explicitly expressed by the patient, about care and treatments that they want, or do not want, to receive at the moment when he / she is incapacitated to freely and autonomously express his / her will.

However, this issue is still unknown and little discussed in our country, which leads to a greater responsibility of the doctor on making end-of-life decisions, and may influence the greater medical decision by refusal rather than by the suspension of therapies. In the present study, 43% of PE cases occurred in patients with neurological disorders, and it could not be identified if the patients had anticipated directives. However, all their relatives were aware of and agreed to the proposed act, and the relatives of 2 patients were present at the time of PE.

This fact corroborates the affirmation of the importance of adequate communication in situations of conflict and the preservation of patient autonomy, even if presumably. It is important to remember that the presence of family members is a right, but not an obligation, and that the observation of a PE can result in emotional distress to the family and consequently to the medical staff. Therefore, the presence of family members during the PE must be evaluated as an exception, and needs preparation that involves the entire multidisciplinary team of the ICU.[19]

In this study, patients submitted to PE had a fairly high average age (73.8 years). In a North American study, patients who were withdrawn from mechanical ventilation were also mostly elderly, with an average of 71 years.[13] These data may lead to the inference that it is easier to accept the finality of the disease and consequently the option of LTE in older patients.[10] Another fact that may have corroborated the high age group of patients who underwent PE is the fact that 43.4% of these patients had been previously admitted to an ICU, which suggests that they were patients suffering from chronic-degenerative diseases and possibly presented some degree of fragility.

The concept of fragility, as a marker of biological age and physiological reserve, may have direct relevance for intensive care, and clearly identifies a population with a higher risk of adverse events, morbidity, and mortality.[4] These data may also have contributed to the short space of time between hospitalization and PE decision in the patients studied.

The main cause of death in the patients in this study was neurological disorder, which coincides with the literature which claims that the option for LTE in patients with poor neurological prognosis, is earlier and more frequent.[15]

When the PE decision is evaluated, there is concern that this act will bring great stress to the patients' family members. However, the papers reviewed indicated the opposite, demonstrating that family members of patients who died in the ICU after PE had reported lower symptoms of depression.[16] Unfortunately, despite the growing realization that LTE brings comfort to the patient and their family members, cultural and religious factors are strongly related to the promotion of dysthanasia. On the other hand, the majority of health professionals improperly associate the well-being of the dyspneic patient with the provision of oxygen support or invasive ventilation. The lack of theoretical foundation also makes these professionals relate the withdrawal of mechanical ventilation to the concept of euthanasia. The low incidence of PE found in this study corroborates these assertions. It should be emphasized that all technical acts must be based on proven experience in the

literature. Therefore, for EP to be indicated, the application of a specific algorithm is an important tool and may help the medical team in the face of the inherent conflicts in the procedure, especially regarding the control of post-extubation respiratory discomfort.[20] It is important to remember that EP is a medical procedure and, as such, should be decided after individual evaluation of the real benefit that this procedure would bring to the patient, and the social context that involves the whole process cannot be underestimated. In addition to the need for adequate communication with the patient's family members, that there is an ethical definition and legal support regarding the withdrawal of therapies considered futile or useless.[21]

As mentioned previously, there is great difficulty on the part of the attending physician to opt for PE for fear that this act is related to the abbreviation of the patient's life time or the induction of death. In this study, it was observed that the time of death after PE varied from minutes to days, reaching a maximum of 9.6 days. In more than half of the cases (56.5%) patients died after 24 hours of extubation, which differs from the analysis done by Huynh et al.[15], where a majority of patients died within the first 10 hours after extubation.

These authors pointed out that patients undergoing dialysis, receiving vasopressors, and with high parameters in the ventilator had a shorter time until death. They also described that patients in the neurology/neurosurgery service had a longer time to live than surgery patients.

It is defined in the reviewed literature that the independent predictors of a shorter time from extubation to death are multiple organ dysfunction, vasopressor use, and hydration. It is also reported that the time of death after withdrawal from mechanical ventilation is very variable, but that most patients die within 24 hours. When only the MV is discontinued, the mean time to death is 50 minutes. The conclusion of these studies was that the time until death would be related to the severity of the disease and not to the withdrawal of therapies.[13,15]

The long average period until death found in the present study may be related to the predominance of patients with advanced age and with neurological disorder.[13,15] It can also be inferred that it is related to a longer period of life after PE, comfort resulting from withdrawal of the orotracheal tube, and the possibility of the presence of relatives.[15]

As previously mentioned, neurological/ neurosurgical patients tend to have longer times until death after ventilator withdrawal, probably due to the absence of severe organ failure beyond the neurological problem already present.[16] However, in this study, neurological patients took less time to die than patients who died from cardiac dysfunction.

The demographic variables and the severity of each case may have contributed to the differences found in this study, as well as in other similar studies.[13] It should also be pointed out that this is a study that evaluated death certificates, which did not allow adequate verification of the actual patients' clinical situation. Therefore, even if the cause of death was cardiac dysfunction, it cannot be said that the patient did not suffer from other equally serious diseases. This is an important bias in this study. In the present study, all patients received some form of analgesia during the last 48 hours of life. Opioids were the most prescribed analgesic medications in this period. Morphine, the drug of choice and the most commonly used in end-of-life pain control, was also the most prescribed in the evaluated patients, followed by fentanyl and tramadol.

The wide use of morphine in end-of-life care is justified by the fact that this drug provides adequate pain control, collaborates in the control of other symptoms, such as dyspnea, and does not present a therapeutic ceiling.[22,23] It is important to add that there is a formal indication of preventive analgesia to symptoms after extubation, that the dose of morphine may be related to the patient's previous conditions, and that higher doses of this drug are associated with a longer time until death.[24]

Sedative medications, such as midazolam and propofol, isolated or associated with opioids, were found in only six (26%) prescriptions of the last 48 hours of life among the 23 patients studied. However, palliative sedation is a potential solution in the control of end-of-life refractory symptoms.[25] However, even though

the increase in opioid and benzodiazepine doses during and after extubation does not reduce the time until death, this method should be used with caution. The fact that, when symptoms are well controlled, there is a lesser need to indicate palliative sedation.[19, 25]

CONCLUSSION

In view of the results pointed out in this study, it can be concluded that PE was an infrequently applied method in the analyzed hospital, that patients who were extubated in a palliative way were older, specially suffering from neurological diseases, and that the mean time between extubation and death was 2.5 days.

It can be inferred that, although PE is ethically accepted in Brazil, it is still a procedure avoided by most intensivists.

It is worth mentioning that for PE to be performed, there is a need for careful patient selection, and for the technical and emotional preparation of the professionals involved in the process.

A limitation of this work was that it has been carried out retrospectively, which leads to a great loss of data. However, the value of this study is based on the facts that Palliative Medicine is a new medical specialty, that the PC in the ICU's deserve a greater approach, and that there is no description in Brazil of PE cases in critically ill patients.

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Received 2015.
Approved 2017.