



Case report

Artificial nutrition in cerebrovascular disease, necessity or futility: Case report

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ABSTRACT

Introduction: Stroke is one of the leading causes of mortality and disability in the world, with clinical manifestations and severe complications that they negatively affect the patient's recovery, contributing to an uncertain prognosis and difficult decisions with bioethical dilemmas such as artificial nutrition in the context of severe stroke.

Presentation of the case: A 49-year-old patient with a Cerebrovascular Accident in a chronic vegetative state, tracheostomy, and gastrostomy user, admitted for infectious complications, whom, under therapeutic proportionality, the decision is made, shared by medical staff and family, to withdraw artificial nutrition.

Conclusions: Difficult decision-making involves multiple challenges for both the health personnel and the patient and his or her environment. It must be guided by bioethical principles and proportionality in favor of the quality of life and the patient's benefit.

1. Introduction

Cardiovascular diseases (CVD), mainly ischemic heart disease and stroke, are one of the leading causes of mortality and disability in the Americas; in 2019, CVD in Colombia caused 130.4 (95 % UI 91.9–176.4) deaths per 100,000 inhabitants, with Cerebrovascular Accident (CVA) being the second leading cause of death [1]. According to the World Stroke Organization (WSO), the lifetime risk of developing a stroke has increased by 50 % in the last 17 years [2].

In Colombia, in 2021, the ESENCIA study (Study of Neurological Epidemiology in Colombia from Administrative Information) was conducted, which determined the prevalence of Cerebrovascular Attacks at 298 cases per 100,000 inhabitants for 2017, with the highest number of cases in the age group 60–69 years [3], being one of the most important causes of physical and mental disability, affecting public health and the quality of life of the person.

As a consequence of the disease, the patient is faced with multiple sequelae and complications, generating an impact on independence, functionality, and cognitive status.

Among them, it is important to highlight swallowing disorders which negatively affect the neurological patient's recovery, in addition to the risk of complications such as bronchial aspiration, repeated respiratory infections, malnutrition, and dehydration (4).

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Furthermore, there is evidence that nutritional status correlates with functional recovery during and after rehabilitation. With this in mind, post-stroke care requires a multidisciplinary approach that includes adequate nutrition to provide patients with ideal conditions for rehabilitation [4].

However, what happens when there is no potential for rehabilitation and there are numerous symptoms or complications that contribute to an uncertain prognosis? In this situation, a decision-making process is needed that addresses bioethical dilemmas, such as the initiation and maintenance of artificial nutrition, thus confronting the need for artificial nutrition versus its futility in certain contexts [5]. The following is a case of a patient with a severe stroke in a chronic vegetative state who required a medical decision to withdraw artificial nutrition in conjunction with the family.

2. Presentation of the case

A female patient aged 49 years, with a history of 3 months ago of hypertensive emergency with cerebral target organ, due to an Ischemic and extensive Hemorrhagic Cerebrovascular Accident in both posterior cerebral arteries, with involvement of basal ganglia, perforating arteries, mesencephalic region, vermis and cerebellar lobe in its anterosuperior portion on the right side; in addition to the hemorrhagic component associated with this last level, including the right thalamic and mesencephalic region and the right thalamic and cerebellar lobe, besides hemorrhagic component associated with the latter, including the right thalamic and mesencephalic region, with significant neurological compromise and structural epilepsy in a chronic vegetative state, with dependence for all basic activities of daily living Barthel scale 0/100 [6], user of tracheostomy and gastrostomy.

She consulted the emergency department accompanied by a relative due to a fever peak of 38.3 °C, associated with greenish discharge from tracheostomy. Furthermore, on admission tachycardia, hypotension, and cramp in both lung fields were also documented. On the other hand, neurologically the patient was in a state of superficial coma, with no eye-opening, no interaction with the environment, no language, not obeying orders, presented with 6 mm hyporeactive pupils, unresponsive confrontational campimetry, primary gaze with exotropia of both eyes, restricted eye movements in all planes and facial symmetry; Additionally, strength with contraction of upper limbs with painful stimulus without withdrawal, no contraction of lower limbs, myotendinous reflexes with hyperreflexia at bicipital and bilateral radial level, and hyporeflexia in bilateral patellar and achilles, bilateral neutral plantar response, and in terms of sensitivity she made pain gestures to painful stimuli of both hemi bodies.

Initially, blood tests were taken with a haemogram showing evidence of leukocytosis with neutrophilia, increased acute phase reactants. Also, chest X-ray was done with left basal parenchymal opacity, giving a diagnosis of pneumonia. The patient had risk factors for multi-resistant germs, for which broad-spectrum antibiotic treatment with cefepime for 7 days was indicated without adverse events; she also presented with pressure ulcers on the sacrum, buttocks, left heel, and left foot under management by the wound clinic.

Her evolution during hospital admission was stationary, and he was not restarted on enteral nutrition for risk of broncho-aspiration; his support was intravenous fluids with normal saline solution 0.9 %. The neurology department considered her neurological state to be irreversible, with a poor neurological and functional prognosis, with terrible rehabilitation potential, taking into account the involvement of both posterior cerebral territories; in addition to thalamus and midbrain, as well as base ganglia (fundamental structures for maintaining consciousness), with a NIHSS score of 31 points [7]. During hospitalization, the question arose as to whether to restart enteral nutrition, given that she already had a gastrostomy, so a multidisciplinary meeting was held with Palliative Care, Internal Medicine, Clinical Ethics, and Nutrition, concluding that she was not considered a candidate for restarting enteral nutrition, as it was a futile measure that would not change the prognosis or natural history of the current disease, therefore, together with the relatives and according to their best interpretation of the patient's wishes, the decision was taken to withdraw artificial nutrition, with reorientation of the therapeutic effort towards purely supportive and comfort measures by the Palliative Care service at home. Finally, the patient died at home in the company of her family 8 days after hospital discharge, receiving support and accompaniment at home from the Palliative Care Service.

3. Discussion

Cardiovascular events, such as stroke, cause physical and mental disability, which give rise to the need for comprehensive rehabilitation, including nutrition as one of its pillars [8].

Within the physical and functional compromise of neurological sequelae are swallowing disorders commonly called dysphagia, with a prevalence of up to 80 % [9]. Although nutritional support through enteral tube feeding may be indicated, it is a temporary measure, not a definitive route of administration in patients with favorable rehabilitation potential [8]. This recovery prognosis will depend on multiple factors, among which the event's initial severity, age, and comorbidities stand out [10].

Persistent vegetative state (VS) is a term described by Jennett and Plum in 1972, as a condition of severe brain damage, where the patient is in a state of wakefulness without detectable consciousness, i.e., there is no awareness of the person or the environment, nor preservation of autonomic functions of the hypothalamus and brainstem. This condition in recent studies has led to replacing the term persistent with chronic, when there is a complete absence of consciousness for more than 3 months after the brain damage [11]. If a patient faces with this pathology, the chances of recovery after three months are extremely rare [12].

The case presented is a patient with a stroke in a persistent vegetative state, with a catastrophic clinical outcome since its establishment, with several recurrent infectious processes and poor prognosis for rehabilitation, so it is necessary to make the best medical decisions in favor of quality of life and seek to avoid futile measures that will not change the natural course of the disease. It is at this point those medical personnel are faced with bioethical dilemmas such as the withdrawal of a therapeutic measure, as artificial nutrition. In the literature, the presence of cognitive-motor dissociation (CMD) among some patients with VS has raised concerns about

the quality of life (QoL) of these individuals; in traditional conceptions of VS, the absence of behavior was assumed to mean absence of awareness and, therefore, absence of suffering, however with the knowledge of CMD comes the concern that some behaviorally unresponsive patients may experience suffering, but may not be able to communicate their wishes or needs [13]. Therefore, withdrawing or withholding any treatment is difficult in any clinical setting, especially when the patient loses the capacity to make decisions, and there is no advance directives document.

In 2022, Nishioka et al. [8], published the ESPEN guidelines in which they conceptualize that nutritional care considering the impact on functional performance, has a weak recommendation in favor. Artificial nutrition is comparable to any other treatment that seeks to sustain life such as dialysis, mechanical ventilation, or vasopressor support and it can be considered as an extraordinary measure [5].

The irreversible neurological state, as in the case of the patient, is a difficult clinical scenario, in which gastrostomy is still a controversial issue and in many occasions, it emerges as a solution in the face of therapeutic frustration. The expected benefit of this procedure should significantly outweigh the risks and complications inherent to the procedure, considering ethical, cultural, legal, and even economic aspects [5,14].

First, it is important to consider therapeutic proportionality, referring to the fact that a medical treatment is ethically obligatory if it provides more benefits than burdens to the patient [15]. At this point, it is important to reflect on whether artificial nutrition can be a disproportionate measure and, therefore, whether can it be withdrawn.

Decision-making based on this question should be guided by the principles of bioethics, where beneficence seeks that the interventions produce gains that significantly exceed the potential risk, avoiding maleficence. In the case of our patient, artificial nutrition using gastrostomy will prolong the agony, going against the ethical principles previously exposed [5,16]. Likewise, the principle of justice must be taken into account when indicating high-cost treatments with unclear benefits [5].

The determination to discontinue nutritional therapy is no different from the decision to initiate it, and the indication to discontinue should be based on the ability of this nutrition to influence the course of the disease, if it were a disease with rehabilitative or curable potential, but not as a measure to prolong life and suffering [5]. Medical treatment that provides no benefit or has become disproportionate can be withdrawn or withheld, while still providing the best palliative care to maximize comfort and quality of life [12].

In 2016, McClave et al. [16], published the SCCM and ASPEN guidelines, where they suggest that artificial nutrition is not obligatory in cases of futile care or end-of-life situations. The decision to provide it should be based on evidence, best practices, clinical experience, and judgment; effective communication with the patient, family, and/or authorized surrogate decision-maker; and respect for patient autonomy and dignity; this is how the best clinical decision was made with the present case, in consensus with an interdisciplinary board with expert professionals.

However, it is important to take into account certain limitations in the development of the present case, such as the initial care of the stroke in another institution and the life support interventions performed in that institution, such as gastrostomy and tracheostomy. Upon arrival at our hospital and evidence of the severity of the clinical situation and neurological irreversibility, the presence of these vital supports generated confusion and dilemmas for both the family and the medical team, making it difficult to make appropriate decisions.

Making difficult decisions involves multiple challenges both for the health personnel and for the patient and his environment, so it is essential to have a clear picture of the disease, prognosis, therapeutic objectives, and benefits that can be provided which must outweigh the risks and complications that may arise. It is essential to keep in mind the patient's autonomy and wishes, when it is not possible to know the patient's wishes, it will be the patient's surrogate decision-makers who will play an elementary role so that, together with the medical team, the best reasonable and proportional decisions are made, to improve the quality of life, and in the representation of the patient's best will.

Ethical responsibilities

Endorsement of the Research and Institutional Ethics Committee of the Faculty of Medicine of the Pontificia Universidad Javeriana and the San Ignacio University Hospital. San Ignacio University Hospital with number 1266-23 on 19 January 2024.

Right to privacy and informed consent

The authors declare that no patient data appears in this article. The authors have obtained informed consent from an authorized proxy of the patient who participated in the research, and the confidentiality of the information will be maintained by not disclosing names or identities. This document is held by the corresponding author.

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Data availability statement

Has data associated with your study been deposited into a publicly available repository?

No, because it is a case report, there is no repository where it can be previously published.

CRedit authorship contribution statement

Julieth Vivian Sarmiento Palma: Writing – review & editing, Writing – original draft, Project administration, Methodology, Investigation, Conceptualization. **Andrea Natalia Castillo Pinto:** Writing – review & editing, Writing – original draft, Investigation, Conceptualization. **Luisa Fernanda Rodríguez Campos:** Writing – review & editing, Supervision.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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