Revisión bibliográfica

Non-invasive mechanical ventilation as a new paradigm in the care of serious patient

La ventilación mecánica no invasiva como nuevo paradigma en la atención del paciente grave

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ABSTRACT

Currently, the use of non-invasive mechanical ventilation, as a measure of life support in the care units for serious patients, has been widely accepted. The objective of this research is to describe the impact non-invasive ventilation as a new paradigm. A literature search was conducted in national journals with CITMA certification and in foreign journals, which addressed the issue of non-invasive mechanical ventilation, mainly in Spanish and English. Those articles published in the last five years were selected. Although there are still issues to be clarified, this life support measure has been proven to be very useful and effective in recent years.

Keywords: non-invasive mechanical ventilation; life support measures; paradigm.

RESUMEN

Actualmente, el empleo de la ventilación mecánica no invasiva, como medida de soporte vital en las unidades de atención al paciente grave, ha tenido gran aceptación. El objetivo de esta investigación es describir el impacto que tiene la ventilación no invasiva como nuevo paradigma. Se realizó una

búsqueda bibliográfica en revistas nacionales con certificación CITMA y en revistas extranjeras, que abordaron el tema de la ventilación mecánica no invasiva, principalmente en idioma español e inglés. Se seleccionaron, fundamentalmente, aquellos artículos publicados en los últimos cinco años. Aunque aún quedan asuntos por aclarar, se ha comprobado que esta medida de soporte vital ha sido muy útil y efectiva en los últimos años.

Palabras clave: ventilación mecánica no invasiva; medidas de soporte vital; paradigma.

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INTRODUCTION

Modern medicine and especially the specialty of Intensive Medicine and Emergencies, with the sophisticated intensive care units (ICU) created to provide specialized medical care to the seriously ill and critically ill patient, is dominated by the application of tip technologies, very sophisticated and also very expensive, which has led to positive results, but when it is used indiscriminately, without taking into account the ethical connotation, has its downside.[1]

These questions before a highly changing and complex world, with new problems that have to be studied from more dynamic perspectives, also require creative and enriching solutions to face them, which in turn demand a deep conscience of the health professional in his way of think and act.

The specialized ICU are highly technical and inconceivable without technology. Increasingly, medical professionalism is understood in terms of scientific knowledge applied to technical skills. Thus, modern medicine is closely related to new and very powerful technologies that offer unprecedented possibilities.[2]

From this perspective, the vertiginous scientific-technological advance has opened new horizons for the practice of modern medicine: it has more accurate and accurate diagnostic means that did not exist before; less invasive medical treatments and increasingly less invasive medical interventions that reduce the risk of complications such as the use of non-invasive mechanical ventilation.

Bioethics as a scientific discipline is very much in vogue in these times, as a result of the demands placed on man in the ethical and moral order by the application of scientific and technical development in the field of medicine and the need for a foundation ethical approach to the

increasingly growing needs of health services.[3]

Do not forget that the practice of medicine has always taken into account the consideration of the ethical aspects involved in its exercise, reflected in deontological codes and international declarations on medical ethics.[4] The vertiginous development of bioethics, has raised issues of vital importance in relation to the use of life support measures in patients admitted to the serious patient care units.

It is understood as life support treatment or measure (VST): any medical intervention, technique, procedure or medication that is administered to a patient to delay the time of death, whether or not said treatment is directed toward the underlying disease or the process biological causal.[5,6] The marked interest towards the use of non-invasive mechanical ventilation (NIMV), as a measure of life support, is not a coincidence, it is expected to solve real problems that science and technology have given rise to with their impetuous development. The health professional should use their scientific knowledge and skills in the management of special techniques only in the best interest of the patient.

It is precisely NIMV one of the most important and controversial issues worldwide, because there are issues of first order at stake such as the patient's life, family dilemma and decision making by the health team about the use or not of this measure of support for life, is therefore one of the issues in constant ascent and forced to bear in mind in the intensive care units.

The main objective is to describe the great impact of the non-invasive mechanical ventilation as a new paradigm and as a measure of vital support to use in certain patients in the current times.

SEARCH STRATEGY AND SELECTION CRITERIA

A review of the use of NIMV in the last five years was carried out as a paradigm change at the current times through theoretical methods and documentary analysis, consulting a total of 70 bibliographical references in languages such as Spanish and English mainly, of which 30 were used to realized this paper, working with LILACS and search engine EndNote. Using the keywords non-invasive mechanical ventilation; measures of vital support and paradigm as a tool. Taking into account those articles that reveal the enormous impact on this measure of vital support in the past five years mainly.

DEVELOPMENT

Non-invasive mechanical ventilation is a novel topic, because it is widely discussed at the present time and worldwide. It is only recently that some quantitative studies carried out in different countries began to be published, dealing with this controversial issue related to the use or not of this measure of life support and its indications in certain patients, which reveals an obvious greater concern and need for reflection. It is considered a novel topic because is just recently that in the last decades this type of ventilation arises in the modern world as a truly "weapon" to be used in the intensive care units. Our criteria is that not a long time ago the lack of interphases represented a serious problem to apply non-invasive ventilation in a wide and massive way, which it could have been the main cause that it was not approved early. But that issue at the present moment is already solved with all the scientific revolution. It is also a controversial topic according to some of its indications, for example; the order of non-intubation in a patient with a terminal cancer. Cuba does not scape to this reality, where on the contrary to other countries such as Spain or Sweden, the patients have autonomy, and it is supported by law, so his will is respected.

At the national and international level, it is striking that the issue of NIMV has been gaining ground in the last decade, as a result of the growing social demand worldwide to unify criteria and make recommendations in relation to its employment in the units of serious patient care, with a view to achieving better management of patients who require it.

In recent years, NIMV has gone from being a craft technique in its equipment and rare in its clinical use, to having a wide variety of technological equipment and devices, with an extraordinary development at present. It is illustrative to see how the topic has an increasing presence in the publications of computerized journals and information networks, as well as in the presentations of the national and international scientific events and events.

For the bibliography consulted both national and foreign, non-invasive mechanical ventilation is not a new practice, but it is considered that is just in the last years that scientific publications reported, sustain with new evidence when and in what patients this variety of ventilation can be applied, proving its true efficiency among health professionals who work in the intensive care units;[7,8,9,10] however, it is not exempt from presenting serious current problems, since the evidence for its use and clinical condition is not clear in all the situations, which evidently require a critical analysis for the development of new paths, towards the search for quick solutions, all of which requires a greater reflection.

It is a topic of current medical reflection, for treating very sensitive aspects, often difficult to solve

for the personnel involved in the decision-making process regarding the use of NIMV as a support measure for the life to be used in some patients; it is one of the topics that offers therefore more ethical dilemmas in the current times.

Much is being discussed worldwide about its application in medical practice; health professionals and especially specialists in intensive medicine and emergency in the country have not escaped this debate, they have not been able to remain outside of their theoretical recreation and practical application in the daily work, sample of this are the articles Cubans published that address this interesting topic.[11,12,13] Despite the fact that the use of NIMV is not a new attitude among health professionals working in the adult care units, where medical specialists can make clinical decisions about the non-establishment or withdrawal of certain therapeutic procedures of life support, there is no explicit and uniform consensus on the way in which this is carried out.

There are no guidelines for good clinical practices, norms or protocols for action, which outline guidelines for behaviors to be followed in Cuba, in relation to the use of it in the intensive care units. There are not protocols adapted to the Cuban context, to achieve generalized ethical-medical uniformity in its application, improve the quality and efficiency of medical care in patients who are admitted to this type of unit.

The important variations in the pattern of their current practice on the adequacy or not of their use in a group of determined patients, as a supportive treatment for life and the great differences in the way of applying it, evidently show the need for a reflective debate on the subject, in search of a uniform consensus on the decisions to be taken and the actions of the physician.

In the clinical field, there are dilemmas that make it difficult to make the right decisions. Good clinical practice means applying therapeutic measures appropriate and proportional to the real situation of the patient, avoiding both therapeutic obstinacy and abandonment, on the one hand, or unnecessary lengthening and deliberate shortening of life, on the other.

Treatment or disproportionate means are defined as: those measures that are no longer adequate to the actual clinical situation of the patient, because they are not proportional to the results that could be expected. It is the one that does not maintain an adequate balance of costs - charges / benefits depending on the objectives pursued; it would not offer a relevant benefit to the patient and would cause great harm or burden to the patient, his family or society. The opposite is a treatment provided.[14,15]

The information about NIMV is fragmented and lacks systematization in the theoretical, methodological and practical aspects in our country. It is necessary to perfect a theoretical body, with the unification of applicable criteria in a uniform manner in all the units of attention to the

serious adult, adjusted to the Cuban socio-cultural context and offering users the guarantee of receiving better specialized medical attention, that allows to diminish the risks of errors in the decision making morally valid and justifiable, in relation to the use of this measure of life support.

The authors based on our own experience in this field and taking into consideration all of the above, we are the criterion that makes it essential to standardize behaviors, agree on recommendations to reduce the great clinical variability with which it is carried out, so that it is possible its homogenous and uniform application in all the units of attention to the serious adult in the country, at the same time that it favours the rational use of the resources and the decrease of the expenses in the national health system.

NIMV as a measure of life support is a technique that can be applied early in certain patients and must be handled by an experienced and adequately trained staff in units where the patient can be perfectly monitored.

In recent years, the possibility that non-invasive mechanical ventilation may be indicated in terminal patients has been debated. According to some authors, it could be considered an adequate and proportionate measure in these patients, since it contributes to the relief of dyspnea in cooperative patients, without turning the act of dying into a long and painful process; as a way of adapting the therapeutic effort if we consider that the fundamental value of medical practice is the well-being of the patient.

The debate is often focused on the concept of futility. It is considered that a treatment is futile when it fails to achieve the desired physiological objective. It is therefore, that medical act whose application to a patient is discouraged because it is clinically ineffective, does not improve prognosis, symptoms or intercurrent diseases or because it foreseeably produces personal, family, economic or social damage, very disproportionate to the possible expected benefit.[16,17]

Our criteria are that this type of ventilation is effective and very useful. Even another therapeutic indication for the use of non-invasive mechanical ventilation would be in the weaning of a patient who hopelessly there was the necessity to intubate at some moment, but he does not longer require it, so the use of non-invasive ventilation could be an alternative to avoid the complications of the reintubation. Failure in the extubation of patients within the intensive care units is not infrequent having to reintubate and therefore increasing the incidence of pneumonia and mortality. Against this, the application of non-invasive mechanical ventilation can be a viable solution that reduces the need for reintubation of the patient.

When the members of the health care team consider that the use of invasive artificial mechanical ventilation (MVA) in a patient would only succeed in prolonging the act of death indefinitely,

turning this into a long and painful process, with prolongation of the death throes of the patient ill, the suffering of their relatives and causes an unnecessary burden for the healthcare team, then this measure of life support turns out to be considered extraordinary, disproportionate and inadequate to the actual clinical situation of the patient.

Invasive artificial mechanical ventilation (VMA) as a measure of life support, becomes in these cases a cruel procedure to delay the death of the terminally ill patient, as a result of the futility of the medical act. This situation has received the expressive name of dysthanasia, cruelty or therapeutic harassment, which is synonymous with human indignity.[18]

Dysthanasia (therapeutic obstinacy, incarnation or therapeutic cruelty): from the Greek dis, 'evil', 'something badly done', and thanatos, 'death'. Etymologically the opposite of euthanasia; that is, to delay the advent of death as much as possible, by all means, proportionate or not, even if there is no hope of cure and even if that means inflicting on the dying someone added suffering to those he already suffers.[19,20,21]

In these cases, the assessment by the members of the health team of the need to adapt the therapeutic effort is possible, with the use of NIMV, which is much more physiological, does not require endotracheal intubation or tracheostomy, with fewer risks of complications such as pneumonia associated with invasive mechanical ventilation, as well as decreasing the patient's need for sedation;[20,21] it is easy to start, also to withdraw, effective in correcting gas exchange and improving alveolar ventilation. Therefore, it represents a more physiological and less aggressive ventilation than invasive artificial mechanical ventilation,[22,23] which allows improving the respiratory rate, decreasing the sensation of dyspnea and increasing the patient's comfort.[24]

In these cases, it is fundamental to relieve dyspnea, pain control, other symptoms and psychological, social and spiritual problems. The goal is to achieve the best quality of life for the patient and his family, to ensure that these patients live fully their last months or days and have a dignified death.[25]

The authors of this article are of the opinion that the success or failure in the use of NIMV as a vital support measure to be used in the units of serious patient care, is strongly related to the adequate selection of the patients who are candidates for this therapy, the very origin of the respiratory insufficiency, the absence of contraindications, as well as the psychological, clinical and gasometric characteristics present in the patients.

The paradigms as ways of thinking of a determined scientific community, have a decisive role in the determination of the behavior patterns of this; in which its members have been carriers of very peculiar traits and common to practically all of them. Virtues such as modesty, perseverance, material disinterestedness, generosity, honesty, simplicity, nobility, dedication and boundless

delivery, among many others have been values that characterize the men of science of the scientific communities in our country. The scientific communities in general tend to cling to a scientific paradigm or system of knowledge which remains relatively stable for a time, which they accept as valid for a generally long period and which often resist change. They affect both scientific thinking and social factors.

These challenges, faced by the specialist in Intensive Medicine and Emergencies, have been caused by the vertiginous and ascending scientific-technological development from the scientific-technical revolution, with its creative dynamism. Faced with such complexity, the new scientific-technological advances, lead to the emergence of a new way of thinking by the medical scientific community, requires a rethinking of the conceptions that underlie medical thought and practice, essential to humanize the technological progress achieved.

The interest of the medical scientific community in the socialist system meshes perfectly with the best interest of society, conceived as a whole and projected towards the predictable future. Health institutions, to the extent that they express the interests and objectives perceived by the medical scientific community, support and enhance the deployment of ethical behaviors.

The use of NIMV will be effective if, in addition to being correctly indicated in patients, there is knowledge and proper mastery of the technique by health professionals; It also has an indisputable ethical nature, which puts a new ethical debate in the medical scientific community on the agenda: the decision to use or not use non-invasive mechanical ventilation in certain patients admitted to the serious patient care units.

The adequate use of NIMV as a measure of life support, in certain patients admitted to the serious patient care units that require ventilatory support, reflects a paradigm shift in this field of medical knowledge in the specialty of Intensive Medicine and Emergencies. This type of reflection is vital to transfer it in a special way, to the new generations of doctors in training and especially in the specialty of Intensive Medicine and Emergencies of our country.

CONCLUSIONS

The reflection on the use of NIMV is a must for the practice of modern medicine in highly medicalized and technified societies; it is a real necessity for the professionals who work in the units of attention to the serious patients, with the aim of describing, orienting and contributing to the clinical ethics of the practical decision making of every day and before each case in particular.

We are sure that it is necessary and it is possible to retry a vision that manages to integrate what in science, technology and ethics is truly valuable, with the rich heritage of Cuban medical thought, for the appropriate and timely use of the non-invasive mechanical ventilation in the units of serious patient care.

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Authors' contribution

Gilberto Lázaro Betancourt Reyes. Wrote and prepared the article. Analyses and discussion of all the information consulted and collection and selection of the most relevant content. This autor participated in the revisión of the final version of this article.

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