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Essay

Cardiopulmonary resuscitation. Beyond the technique[☆]



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ABSTRACT

This reflective article presents the current state of cardiopulmonary resuscitation (CPR) and reviews it from a bioethical standpoint. It starts with the ineffectiveness of CPR and the reasons why today it is a universally applied procedure, sometimes without taking into consideration the wishes or condition of the patient. Possible courses of action for the continuous improvement of cardiopulmonary resuscitation are proposed, especially from the humanistic point of view. Greater involvement of patients and their families in medical decisions, particularly in the planning of medical management rather than in the acute phase of the disease—as is the case for CPR—is encouraged.

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Reanimación cardiopulmonar. Más allá de la técnica

RESUMEN

En este artículo de reflexión se presenta el estado actual de la reanimación cardiopulmonar (RCP) y su revisión bioética. Se parte de la poca efectividad de RCP y las razones por las cuales hoy en día es un procedimiento de aplicación universal, en ocasiones sin tener en cuenta el estado o deseos del paciente. Se presentan posibles caminos de acción para el mejoramiento continuo de la reanimación cardiopulmonar especialmente desde el punto de vista humanístico. Se incita a una mayor participación de los pacientes y sus familiares en las decisiones médicas, especialmente en la planeación del manejo médico más que en el momento agudo de la enfermedad, como es el caso de la RCP.

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Introduction

Anesthesia is considered to be a leading specialty in cardiopulmonary resuscitation (CPR), the supervision of clinical practice guidelines, and specialized courses in the field. As such, a rational analysis of CPR instructions should be initiated, at the level of scientific societies. This is due to the fact that even though CPR is administered with good intentions, and it is an extraordinary medical intervention that is capable of preventing premature death, it can also disastrously prolong the death process, thereby increasing the suffering and stress experienced by the patient and their family, and spending—futilely—economic resources that are important for society.^{1,2}

Despite advances in technique and new medications, the effectiveness of CPR continues to be low. Only a small percentage of the people that suffer a cardiac arrest manage to survive and be discharged. Paradoxically, for the general public and for the majority of physicians, if there is no “do not resuscitate” order, there is no reason to not initiate chest compressions, administer electric shocks, and intubate all patients in cardiac arrest.³ We can be sure that, today, CPR is one of the few medical interventions that everyone hopes to perform.

Asking when not to perform CPR generates concern and controversy, as it is a rarely discussed theme. As Brindley² asserts in an editorial of the British Journal of Anaesthesia, this takes place because the majority of the literature focus more on the technique than on who is being resuscitated.

Historical development of CPR

Modern CPR was described by (among others) Peter Saffar and his collaborators in the 1960s. The intervention was meant for treating witnessed cardiac arrests in operating rooms. Although none of the pioneers of this technique ever proposed that it should be a universally performed procedure,² little by little it was disseminated to the point that the error was committed of assuming that any person—no matter the place or the patient—could perform CPR. The use of the CPR technique expanded rapidly, not only among physicians but also among the general population. The popularity of this procedure grew and became so strong that today it is seen as “obligatory” to perform cardiopulmonary resuscitation maneuvers on all patients in cardiopulmonary arrest. This is so common that, in the majority of cases, dying in a hospital means undergoing CPR.⁴

The success of CPR

Although the success rate for the immediate restoration of circulation after an in-hospital cardiac arrest is close to 60%, only between 6.5% and 24% of patients with cardiac arrest leave the hospital alive.⁵ This does not take into account the patient's neurological status or their quality of life. For the rest of the patients—that is, for the 76%–93.5% for whom CPR was not successful—this maneuver can be considered an extension of the patient's dying process. With this prolongation, the dying period could be increased by hours or days in an intensive

care unit. The wide range of success (between 6.5% and 24%) depends on whether or not the cardiac arrest was witnessed, among many other factors. In hospitals' general services, the success rate is much lower than in operating rooms or in the ICUs (where the majority of cardiac arrests are witnessed and the resuscitation maneuvers are initiated rapidly). There are other factors that are considered to be independent predictors of death in the first 24 h after a cardiac arrest. Examples include being male, and the non-shockable cardiac arrest rhythms: pulseless electric activity and asystole.⁶

Why has CPR become so widespread?

Based on moral arguments that claim that patients have the right to the opportunity to survive, the procedures of CPR, have been justified for years, generally, without the consent of the patient or their family.⁷ These procedures including external chest compressions, tracheal intubation, venous cannulations, electric shocks and the administration of medications, little by little, and due to multiple factors, CPR went from being an intervention directed toward patients with reversible cardiac arrest causes, to being an indiscriminately administered intervention, converting almost completely into a social right, one that is occasionally even demanded by patients and family members.²

The reasons for which physicians perform CPR maneuvers on all patients that suffer a cardiac arrest—and for which the general population demands this behavior—are probably a mix of factors that gradually became engrained in clinical practice and in society. Among these factors are some that depend directly on physicians, the patients, the influence of television and other media, and so forth.

Physician dependent factors

Among the factors that depend on the physician are the fear of legal persecution or medical-legal problems; and the fear of therapeutic failure—the difficult-to-judge limits between giving up and continuing. Perhaps a “Do Not Resuscitate” order (DNR) is still misinterpreted as “abandoning the patient”. We may suppose, in the same way, that in cases like this, progress is usually interpreted as “doing more” and never as “doing less”.

Medical teaching is based on “doing”—doing interventions, doing procedures. Very rarely do we teach to “not do” and to talk with the patient. The preference toward “doing” before “not doing” may bias the physician toward aggressive treatment strategies (“doing” strategies) starting in their training. Although effective, the traditional focus of medical teaching centers more around medical duties than on the patient. This focus is not always respectful of the patients' wishes and goals.

Another factor that depends on the physician, and that is not always explicit, is the desire to avoid difficult conversations with patients and their families. Holding a conversation with them about death and the possibility of a DNR can be morally taxing. Many physicians adopt a posture that could be considered to be easier and less compromising morally: not speaking, not commenting, and, if cardiac arrest occurs,

performing CPR maneuvers. Their skills are put into practice, and if the patient recovers a spontaneous heart rhythm, the patient is taken to the ICU without the physician worrying about the patient's quality of life or about talking with the family. As the National Confidential Enquiry into Patient Outcome and Death (NCEPOD) in the United Kingdom mentions, the discussion with the family regarding a DNR, or the limitation of therapeutic effort may be the most difficult procedure carried out in the modern hospital.⁸

Patient dependent factors

Among the factors that influence the patient—besides cultural, religious and ethnic factors—we may also find ignorance about the risks of CPR, and its rates of success. In 1994, Murphy conducted a study on 287 patients over 60 years old. He asked them about their desire to receive CPR if they were to suffer a cardiac arrest. Before knowing the probability of survival after CPR, 41% wanted to receive the intervention. After they were informed of this probability (they were told that it was around 10%–17%), only 5% wanted CPR.⁹ This study leads us to think that many patients probably make decisions about their treatment, in this case CPR, without knowing the possible results. Thus, their decisions may be made on fictitious foundations.

Media influence

Marco and his team conducted a study on 1831 people to determine to knowledge of the general public with respect to the effectiveness of CPR. They found that the perception of the survival rate of CPR oscillates between 50% and 60%, similar to the rate portrayed in television series. In films, physicians stop at nothing to resuscitate a patient in cardiac arrest and to “save their lives”. Film and television producers frequently use CPR because it attracts an audience. When TV physicians firmly grasp their defibrillator paddles and administer a high-voltage shock to the subject's chest, they “save” an average of 55% of their patients. As can be seen, the CPR success rate in films or television dramas, along with the general public's perception, is totally out of synch with what happens in the real world. Survival with a good quality of life in films and TV series is similar to the idea that the general public usually has: ER 68%, Chicago Hope 64%, Grey's Anatomy 46%, Casualty 42%, and ER, Chicago Hope and Rescue 911, 75%.^{10,11} The CPR success rate in films and television series has an enormous effect on patients, their family members, and even on physicians.¹² It is a challenge for many real-life physicians to be able to lead their patients, and even their colleagues, to consider a DNR, as they generally have an unrealistic understanding of CPR's effectiveness and complications.

The phenomenon of the erroneous perception of the effectiveness of CPR does not only occur among the general population. Many physicians do not have a clear idea of the CPR success rate either. In personal, uncontrolled observations, physicians in different specialties believe that the effectiveness of CPR may be as much as 50%–70%, similar to the general population's perception.

Possibly based on the factors described above, and with economic aims, some national and international organizations promote basic and advanced CPR courses. Generally, they have short terms of validity and they require updates and new courses for certification (an essential requirement in many hospitals and health institutions to be able to work). It is necessary to clarify that, during these courses, the theme of ethics or the deleterious effects of CPR are rarely touched on. Emphasis is made, solely, on the technique: chest compressions, ventilation, intubation and defibrillation. This is much more showy and commercial. The message conveyed by these courses is that one should attempt to resuscitate with good technique, no matter the patient.

The reasons presented above have probably contributed, to a greater or lesser extent, to the great social acceptance and integration of CPR, transforming it from an “occasional and specific” procedure into a “mandatory” one in the majority of cases.

What to do?

Bioethical focus of CPR

When a patient is in danger of dying within a question of minutes, as is the case for cardiac arrest victims, the moral exercise of quickly considering that any resuscitation attempt has the goal of avoiding death (do no harm) and of prolonging life (do good). In general, although the benefit of a treatment (do good) depends on the result of the intervention, the most important factor is the perception that the patient has of this result.¹³ It is here where autonomy takes on importance, surpassing the need to do good and to do no harm. Some patients want to be resuscitated because of the tiny possibility of surviving, but the great majority do not want to run the risk of “sort of surviving”, with long periods in the ICU without any recovery of quality of life, which can be much more important than the quantity of life that is offered.

The first thing that the physician should ask is up to which point should the events that potentially threaten the life of a patient be treated—especially when the benefits that one can expect to obtain may be almost none, and rarely lead to a future life that is comparable to the one enjoyed before the event. This questioning leads to multiple controversies. This, however, is the aim of this article, to call into question.

It is time to act

In the report of the National Confidential Enquiry into Patient Outcome and Death, (NCEPOD), in 2012, entitled “Time to Intervene?”, physicians are called to question the administering of CPR to all patients that suffer from a cardiac arrest. They are reminded of their duty to articulate the realities of cardiopulmonary resuscitation in their daily clinical practice.⁸ One of the strategies proposed to achieve this is to introduce the evaluation of the patients' clinical presentations within the first 24 h of admittance to the hospital. In this way, those who are at risk of suffering a cardiac arrest are identified, and the topic of CPR can be discussed with them in order to ascertain if they wish to receive CPR or not and if they

have a DNR, an advance directive or a document guaranteeing their right to die with dignity. This approach should be carried out directly with the patient or their family members, noting down whether CPR should or should not be performed in the case of cardiac arrest. Indifference with regard to this topic is unacceptable, especially when no measures are taken and caregivers act with surprise when fragile patients suffer a supposedly unexpected cardiac arrest. There is much to do, and the work starts at the patient's bedside.⁸ Communication with patients and their families about whether or not to perform CPR if cardiac arrest occurs is too important to leave to chance or coincidence. Physician-patient-family member communication is one of the moral obligations of all physicians. This especially requires time, experience and skill. It should not be routinely left to younger colleagues or to those in training. The NCEPOD also recommend that each hospital or clinic carry out a periodic review of all CPR interventions performed, analyzing which patients should have had a DNR and which patients should not have.^{2,8}

Re-education beyond the technique

The education, or rather re-education, of physicians with respect to CPR advice and survival rates should be a priority. This should be backed up by continuous medical education programs at both the undergraduate and post-graduate level and should aim toward an ethical and scientific integration that allows physicians to analyze and approach ethical conflicts surrounding CPR.

The CPR standards should be redefined, placing emphasis on "who to resuscitate" just as much as on "how to resuscitate", and modifying the criteria of "when not to perform CPR". Still, in many scenarios, we still think as Dull did, that CPR should be initiated in all patients with signs of cardiac arrest unless there are obvious signs of prolonged cardiac arrest, such as decomposition or lividity.¹⁴

Conclusions

If we do not call our "duty" into question, our profession could gradually go from improving people's quality of life to prolonging their deaths, and we could run the risk of becoming technicians that simply perform interventions and turn on machines without taking into account our profession's main concern: the patient.⁷

What has happened to CPR, as it has gone from being recommended in specific case to being applied universally, is an example for other procedures that are being described or developed today.^{2,7,15} Before establishing a new therapy or technology, time should be given to debate and to explore possible results before the new procedure becomes a universal one without an adequate analysis of its risks. It should be analyzed from all the scientific and ethical standpoints, with clear recommendations and limitations so as to not commit the same mistakes that were committed with CPR. It is best to embark on new ventures with a destination in mind, as Heyland suggests in his article.¹⁵

Anesthesiology has been one of the leading specialties in the "medical culture of safety". This is why it should lead at this moment in history to redefine CPR recommendations with the goal of preventing premature deaths whenever possible without prolonging the death and agony of thousands of patients, thereby protecting individual autonomy and vulnerability.

Conflicts of interest

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