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REVIEW

Nursing in cardiorespiratory arrest of pregnant women: Integrative review of duties and good practices

Cuidados de enfermería en la parada cardiorrespiratoria de mujeres embarazadas: Revisión integradora de deberes y buenas prácticas

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ABSTRACT

Introduction: the role of nurses in cardiopulmonary arrest in pregnant women is extremely important, given that cardiopulmonary arrest in pregnant women is a rare occurrence and requires an immediate and effective approach and that nurses are often the protagonists in this situation. To identify the role of nurses in cardiopulmonary arrest in pregnant women through a literature search.
Method: the method is based on a descriptive, non- randomized, quantitative and exploratory data analysis study. The subject descriptors were taken from the Virtual Health Library, where the following were found: *"Cardiopulmonary resuscitation", "Pregnant women" and "Heart arrest"*.
Results: 14 articles were found from the last 5 years, between 2018 and 2022 and in the databases (MEDLINE, LILACS and BDENF). Little is said about the role of nurses in dealing with cardiac arrest in pregnant women, as they are the professionals who are most often at the forefront of hospital care.
Conclusions: it was noted that the material found deals little with the role of nursing as a major professional in the event, and given that it is their professional responsibility to conduct themselves in this situation, there is a need for more study materials, training and greater dissemination of techniques as essential and irrevocable bases for saving lives.

Keywords: Cardiopulmonary Resuscitation; Pregnant Women and Heart Arrest; Nursing.

RESUMEN

Introducción: el papel de la enfermería en la parada cardiorrespiratoria en la embarazada es de suma importancia, dado que la parada cardiorrespiratoria en la embarazada es un hecho poco frecuente que requiere un abordaje inmediato y eficaz y que la enfermería suele ser la protagonista de esta situación. Identificar el papel del personal de enfermería en la parada cardiorrespiratoria en gestantes a través de una búsqueda bibliográfica.
Método: el método se basa en un estudio descriptivo, no aleatorizado, cuantitativo y exploratorio de análisis de datos. Los descriptores temáticos se tomaron de la Biblioteca Virtual de Salud, donde se encontraron los siguientes: «Reanimación cardiopulmonar», "Embarazadas" y "Parada cardiaca".
Resultados: se encontraron 14 artículos de los últimos 5 años, entre 2018 y 2022 y en las bases de datos (MEDLINE, LILACS y BDENF). Se habla poco del papel de las enfermeras en el abordaje de la parada cardiaca en la embarazada, siendo ellas las profesionales que más frecuentemente están al frente de la atención hospitalaria.
Conclusiones: se constató que el material encontrado trata poco del papel de la enfermería como profesional principal en el evento, y dado que es su responsabilidad profesional conducirse en esta situación, es necesario

más material de estudio, formación y mayor divulgación de las técnicas como bases esenciales e irrevocables para salvar vidas.

Palabras clave: Reanimación Cardiopulmonar; Embarazadas y Parada Cardiaca; Enfermería.

INTRODUCTION

The role of nurses in cardiopulmonary arrest in pregnant women is extremely important, given that cardiopulmonary arrest in pregnant women is a rare occurrence and requires an immediate and effective approach and that nurses are often the protagonists in this situation, more information is needed on how to proceed, specific knowledge and approach protocols with continuous training, so that the outcome is the best possible and for this to happen, knowledge of the entire process that can result in cardiopulmonary arrest is extremely important.[1]

The Cardiovascular System is made up of a continuous blood pumping network and is divided into two sides: The right heart which sends blood to the lungs and the left heart which sends blood to the rest of the body, via the aorta artery, both made up of distinct chambers: atria and ventricles which in turn have valves that prevent the return of blood by propelling it forward (atrioventricular valves and semilunar valves). Control of the heart rhythm is linked to the Sinoatrial Node, Atrioventricular Node and Purkinje fibers (very fast conducting cardiac fibers) which conduct the cardiac impulse.[2]

During pregnancy, the heart changes its position due to the gravid uterus pushing it upwards, rotating it forwards and laterally displacing its left edge.[3]

Cardiorespiratory arrest (CA) is the inefficiency or absence of effective cardiac movements to maintain the circulation of the main organs, so that the pressure exerted by the heart muscle is not sufficient for the blood to oxygenate the tissues, accompanied by intense respiratory distress followed by apnea.[4]

When dealing with cardiac arrest in pregnant women, we have all the physiological changes that come with pregnancy, such as cardiovascular alterations, which change the approach to some specific points. It can be seen that the gravid uterus occupies a large part of the pregnant woman's body, requiring a differentiated approach.[5]

Common causes of CA in non-pregnant women are Acute Coronary Syndromes (ACS) and other acute cardiomyopathies. In pregnant women, magnesium sulphate poisoning, pre-eclampsia, aortic artery dissection, drug overdose, amniotic fluid embolism (AFE), pulmonary embolism, stroke and trauma are the most common.[6]

According to the new American Heart Association protocol[7] the possible causes of CA in pregnant women are related to complications: A= Anesthesia (anesthetic complications); B= Bleeding; C= Cardiovascular; D= Drugs; E= Embolism, F= Fever; G= General non-obstetric causes; 5 Hs (Hypoxia, Hypokalemia/hyperkalemia, Hydrogen ion de (acidosis), Hypothermia, Hypovolemia); 5 Ts (Tension pneumothorax, Cardiac tamponade, Toxins, Coronary thrombosis, Pulmonary thrombosis); H= Hypertension.[8]

Cardiovascular and hemodynamic changes occur in the pregnant woman's body, which can change the conduct of nursing staff and the multidisciplinary team: changes in cardiac output with an increase from 5 to 7 liters/min apparent from the start of pregnancy, an increase in blood volume of 30 to 40 %, a 35 % decrease in peripheral vascular resistance due to the increased size and quantity of uterine veins, systolic and diastolic blood pressure decreasing by 5 to 10 mmHg in the 2nd trimester (average of 105/60), with systolic volume rising in the 3rd trimester (10 %), normalizing at birth.[9,10]

Maternal heart rate increases by 10 to 15 bpm starting in the first 5 weeks and continuing until the 28th to 32nd week. The gravid uterus prevents venous return by compressing the inferior vena cava, causing supine hypotension syndrome starting in the 20th week, venous pressure in the lower limbs increases around threefold due to compression in the pelvic veins (when standing), there may also be an increase in leukocytes and coagulation factors, favoring hypercoagulability of the blood and a greater occurrence of thrombosis.[11]

According to the World Health Organization (WHO), normal childbirth is childbirth that occurs naturally, with low risk during labor until the baby is born. It can be assisted by obstetricians, midwives and obstetricians as long as they are duly qualified, and consists of four distinct periods: dilation, expulsion, secundation and Greenberg, when major cardiovascular changes occur in the pregnant woman's body.[12] In the dilation period, there are rhythmic uterine contractions, the beginning of dilation of the cervix which ends with complete dilation at 10 cm, in which we have gradual cervical dilation (latent phase) and progressive cervical dilation (active phase). In the expulsion period there is complete cervical dilation followed by expulsion of the fetus. In the secundum period we have the detachment, descent and expulsion of the placenta. In the Greenberg period, which refers to the first hour postpartum, professionals should be aware of the risk of puerperal bleeding. If there are any complications due to dystocia (alterations that make labor impossible or difficult), the delivery should be assisted by the medical team, and an instrumental delivery or caesarean section should be performed.[13,14]

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During labor there are cardiovascular and hemodynamic changes that can be associated with pain and anxiety, raising heart rate and blood pressure (sympathetic response), with each uterine contraction with an autotransfusion of 300 to 500 ml of blood back into the circulatory system, during contractions with an increase in cardiac output of approximately 35 %, during the interval between contractions with an increase in cardiac output of approximately 10 %, in the expulsive period (pulls) with an increase in cardiac output of approximately 50 % and in the immediate postpartum period uterine contraction causes blood autotransfusion of 300 ml, increasing cardiac output by 60 to 80 %.[15,16]

In accordance with the World Health Organization (WHO) data collected by the Brazilian Obstetric Observatory, notified by the State and Municipal Health Secretariats, it was recorded that in 2021, the maternal mortality ratio was 107,53 deaths per 100 000 live births based on preliminary data, and in 2019 the number of live births was 53,31 per 100 000, and in 2020 71,97 deaths per 100 000 live births, with a 77 % increase in maternal deaths between 2019 and 2021. It is noted that many deaths occurred due to indirect causes (previous illnesses or illnesses that began during pregnancy, such as SARS-CoV-2), but these deaths may be underreported on death certificates that are filled out without specifying the cause of death, but rather with a record of general illness.[17,18]

Management of CRP in pregnant women

The Basic and Advanced Life Support algorithm, according to the American Heart Association (AHA) Guideline, assumes that oxygenation and airway management should be prioritized during CPR in pregnant women due to hypoxia.[19,20]

The Basic Life Support (BLS) protocol for CPR in pre-hospital care for adult patients states that two professionals must be present at the scene, so for pregnant women there is no evidence of the number of professionals needed to carry out the action, either in-hospital or out-of-hospital. However, based on the authors who mention resuscitation in adults, it should be borne in mind that in order to carry out CPR on pregnant women, at least 5 professionals are needed: 1 professional in charge of ventilation, 2 professionals in charge of compressions (if they take turns), 1 professional in charge of administering medication and 1 professional who will be responsible for moving the uterus manually throughout the care.[21]

When a pregnant woman is in cardiopulmonary arrest (CPR), a protocol must be followed so that care can be provided quickly and effectively in order to protect the binomial (mother-fetus).[22,23]

In prehospital care for pregnant women in cardiac arrest, before starting the maneuvers, check that the environment is safe, and if it poses any risk to the pregnant woman and/or the team, remove her to a safe place. Call for the pregnant woman vigorously, if she is unresponsive, immediately ask for help by phone or from someone else nearby, asking them to call the emergency services and bring the Automatic External Defibrillator (AED), which should be installed as soon as possible.[24]

Intra-hospital care for pregnant women in cardiac arrest follows the same protocol of checking the safety of the area and calling for help, ringing the bell and/or alarm to inform them that there is a cardiac arrest and to bring the resuscitation trolley and multi-parameter monitor.[25]

Check the carotid pulse for a maximum of 10 seconds. If the pregnant woman does not have a heartbeat, start the Cardiopulmonary Resuscitation protocol immediately.[26]

Position the pregnant woman in dorsal decubitus (abdomen up), place the rigid board for compression if the pregnant woman is in bed, open the airways to check for possible causes of obstruction and aspirate if necessary, offer 100 % oxygen support in a non-rebreathing mask until access is obtained via an advanced extraglottic airway (laryngeal mask) or oro-tracheal intubation.[27]

Lateralize the uterus manually to the left side (a maneuver performed throughout the service) when the gestational age is greater than 20 weeks, start compressions by deepening the chest by approximately 5 cm, allowing it to fully return, in a cycle of 30 compressions for 2 ventilations with a Bag Valve Mask, popularly known as “AMBU”, at this point the fetal monitors should be turned off so as not to disturb CPR.[28]

As soon as access is gained to the advanced airway, start with 1 ventilation every 6 seconds (10 ventilations/minute) and a total of 100 to 120 compressions/minute uninterrupted, allowing the chest to return fully; in the event of tiredness due to physical exertion, the professional responsible for the compressions should ask for them to be changed, so that high-quality compressions are maintained, knowing that due to hypoxemia the fetus can have brain damage.[29,30]

The position of the hands for performing CPR should be slightly above the sternum due to the anatomical changes in the position of the heart during pregnancy.[31] Venipuncture with a large-gauge needle catheter for the administration of Epinephrine (1 mg every 3 to 5 minutes) in non-shockable rhythms (asystole and Pulseless Electrical Activity) should be performed above the diaphragm, due to aortocaval compression.[32]

When spontaneous circulation is restored, the pregnant woman should remain under targeted temperature control, as fetal bradycardia can occur and maternal survival has been reported up to 15 minutes after cardiac arrest and neonatal survival up to 30 minutes.[33]

Perimortem cesarean section (performed when the pregnant woman is “in extremis” or under cardiopulmonary

resuscitation) is indicated if after 2 cycles of 2 minutes of CPR the pregnant woman is still in cardiopulmonary arrest. This is because after uterine evacuation there is a 60 % increase in cardiac output due to decompression of the vena cava that was being compressed by the gravid abdomen.[34]

Cardiac arrest during pregnancy is a relevant issue for the nursing field in obstetric emergencies. Currently, little is heard about what nurses' duties are in relation to pregnant women with this clinical condition.

However, this study aims to identify, through an integrative literature review, and describe the scientific evidence on the role of nurses in cardiopulmonary arrest in pregnant women.

METHOD

This is a descriptive, quantitative and exploratory integrative review of data analysis, using Chapter 28 - Cardiorespiratory Arrest in Pregnant Women as a parameter for the development of this study.[35] The inclusion criteria were articles in Portuguese, Spanish and English, women witnessing cardiopulmonary arrest, nurses as the main agents in the conduct of cardiopulmonary arrest, complete articles of the literary review type and articles dealing with the subject described, which were indexed in the Nursing Database (BDENF), Latin American and Caribbean Literature in Health

Sciences (LILACS), Scielo and MEDLINE. The inclusion criterion was articles from the last 5 years containing the following subject descriptors: "Heart arrest", "Pregnant Women", "Cardiopulmonary resuscitation". Due to the scarcity of articles published on cardiopulmonary arrest during pregnancy, we included all those that dealt with it according to the subject descriptors (DeCS), literary reviews and those that were available in full in the databases.

The articles were screened in tiers, with the first tier excluding articles based on the title and abstract, and the second tier reviewing all the articles to check that they met the inclusion criteria. A reviewer was also used in the selection to increase the fidelity of the articles selected, to the point of avoiding disagreements.

The selected articles were filtered according to their subject of interest to the proposed work. The exclusion criteria were articles that were not indexed, letters to the authors, duplicates, articles that were not in their entirety, and articles in other vernaculars than those mentioned.

The guiding question that underpinned the study was: Is there evidence of the role of nurses in CPR in pregnant women reported through scientific evidence published in recent years? The research was carried out between February and June 2023 using the databases mentioned above. A search was carried out with the descriptors mentioned, as the combination of descriptors involving the word nurse and nursing were not found in recent years. The table below shows the articles found with the above-mentioned descriptors and the number of articles in each of the databases. The descriptors were in the English vernacular and using the Boolean operators AND between the subject descriptors. We used the Zotero® platform to store the articles and design the study.

Research was carried out in two stages: the first stage was to identify the central problem and search the literature for quantitative research that addresses the central objective of the work and the development of the guiding question; the second stage was to determine which articles fit the proposal of the objective in question.

To check the quality of the article, risk of bias tools such as the Cochrane Risk of Bias Tool or the Newcastle-Ottawa Scale were not used, as this was an integrative review and not a systematic literature review. However, they were reviewed by another reviewer who took part in the work so that any disagreements could be resolved.

RESULTS

Table 1. Databases and study design on the bibliographic findings relating to the proposed objectives

Author	Databases	Type of study	Titles
Muniz MLC et al. 2022.	Scielo	Methodological study	Construction and validation of an educational video for nursing students on obstetric cardiorespiratory arrest
Lipowicz AA et al. 2018.	Medline	Observational study	Incidence of outcomes and compliance with out-of-hospital maternal cardiac arrest resuscitation guidelines
Ornato JP et al.2018.	Medline	Observational study	Non-invasive characterization of hemodynamics in adult patients with out-of-hospital cardiac arrest shortly after return of spontaneous circulation.
Adan AJ et al.2019.	Medline	Etiology study	Use of tandem perimortem caesarean section and open chest cardiac massage in the resuscitation of peripartum cardiomyopathy, cardiac arrest.
VJV Commissary VJV Commissary et al. 2019.	Lilacs	Clinical practice guide	Challenges sections during perimortem caesarean

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Cimpoesu D et al.2019.	Medline	Clinical practice guide	Cardiac arrest in special circumstances - recent advances in resuscitation
Helviz Y et al. 2019.	Medline	Systematic review	Maternal cardiac arrest
Maurin O et al.2019.	Medline	Observational study	Maternal out-of hospital cardiac arrest: a retrospective observational study
Comito C et al. 2020.	Medline	Literature review	Cardiac arrest in the delivery room after spinal anesthesia for caesarean section
Njvatpumin P et al. 2021.[18]	Medline	Observational study	A ten-year retrospective review of maternal cardiac arrest: incidence, characteristics, cause and outcomes in a tertiary hospital in a developing country
Thomas M et al..2021.	Medline	Clinical practice guide	Survival outcomes and measures of the resuscitation process in hospitalized maternal cardiac arrest
Canon V et al. 2022.	Medline	Longitudinal study	Out-of-hospital cardiac arrest in pregnant women: a French cohort study of 55 patients
Enomoto N et al. 2022.	Medline	Systematic review and meta Analysis	Effect of maternal positioning during cardiopulmonary resuscitation
Li P et al.2022.	Medline	Diagnostic study	Can cell salvage be used for resuscitation in a patient with amniotic fluid embolism and liver laceration? A case study

Table 2. Summary of nurses' duties in the management of CRPS in pregnant women

Author/ Year	Data analysis
Muniz MLC et al.2022.	As part of the multidisciplinary team, nurses are directly involved in cardiopulmonary resuscitation in the event of a CPR, and it is extremely important that they master the techniques, have the skills and know the correct management of a CPR in pregnant women. It is known that basic life support offered in the immediate aftermath of the event is decisive in restoring spontaneous maternal circulation and improving the survival of the fetus. Further studies are needed, so this educational material was created for the nursing team.
Lipowicz AA et al. 2018.	Reports of cardiac arrest are recorded in the in-hospital environment, but there are no out-of-hospital reports to observe the incidence and frequency; the current guidelines are aimed at pregnant women, but there is no record of management with uterine displacement and no perimortem caesarean section within 5 minutes of cardiac arrest. The importance of professionals having the knowledge and skills to treat maternal cardiac arrest was noted. Not addressing the role of nurses in cardiac arrest
Ornato JP et al.2018.	There is little information on the hemodynamics of patients after cardiac arrest with return of spontaneous circulation. It is known that in 1984, when higher doses of epinephrine were used, systemic vascular resistance was notable. It does not address the role of nurses in cardiac arrest.
Adan AJ et al.2019.	Case report on a caesarean section performed at the bedside of a young pregnant woman (23 years old), gestational age 38 weeks with cardiomyopathy, who evolved to CPR in AESP rhythm, bradycardic fetus, emergency caesarean section and left thoracotomy with open chest resuscitation. The final outcome, after the mother and newborn were attended to by the Multidisciplinary Team in the Intensive Care Unit, was that both were discharged from hospital without neurological impairment. Not addressing the role of nurses in CPR.
VJV Commissary et al. 2019.	Perimortem cesarean sections are infrequent, but are characterized as medical catastrophes and should be carried out within the first 5 minutes after CPR. The team should work with protocols to obtain the best results. The need to train the multidisciplinary team and to carry out frequent studies and discussions on the subject was highlighted.
Cimpoesu D et al.2019.	It covers CPR in special circumstances requiring emergency interventions for special causes, where we have special environments and patients. In specific cases, we must identify the arrest and the victim's needs in order to choose the most effective measure, knowing that there are no specific guidelines for these cases, even with all the advances today we have the extracorporeal/oxygen life support device. Specific locations: cardiac surgery, catheterization laboratory, dialysis unit, commercial aircraft, air ambulance. Special patients such as those with asthma, neurological diseases and obesity. It does not address the role of nurses in CPR.

Helviz Y et al.2019.	Pay attention to early airway management and drug complications, since an important cause of CA is anesthetic complications. PEA and VF arrest can be indicative of hemorrhage, thromboembolism can be diagnosed by echocardiography, manual displacement of the uterus to the left for decompression during CPR and premature delivery within 4 to 5 minutes are important measures to take and can change the outcome of CPR. It does not address the role of nurses in CPR.
Maurin O et al.2019.	Out-of-hospital cardiac arrest is a rare event that is most often assisted by the pre-hospital care team. A study of women over the age of 18 who suffered a CA over a 5-year period. There were 19 515 cases occurred, where 16 were pregnant women aged approximately 31 years and 20 weeks pregnant, 3 of them had an initial rhythm of ventricular fibrillation (18,8 %), 1 of them underwent thrombolysis; of these 16 pregnant women, 6 died after on-site resuscitation (38 %), the other 10 were referred to hospital with return of circulation by mechanical CPR device and 30 days after the arrest only 2 were alive, showing the need for recommendations aimed at this complication and the difficulty of performing it in out-of-hospital environments. It does not address the role of nurses in CPR.
Comito C et al. 2020.	CA after regional anesthesia is very low, however, due to the vasovagal reaction caused by the Bezold-Jarish reflex (BJR), a cardioinhibitory reflex that includes the triad of bradycardia, hypotension and peripheral vasodilation, This event can occur in emergency caesarean sections after spinal anesthesia, which is why it is so important to train the multidisciplinary team (midwives, obstetricians, neonatologists, intensivists) to perform perimortem caesarean sections. Caesarean section should be considered at gestational age > 20 weeks; from 20 to 23 weeks, hysterotomy should be performed, with a greater chance of maternal survival, and > 23 weeks, maternal and neonatal survival (depending on the prematurity of the NB). It does not address the role of nurses in cardiac arrest.
Patchareya N et al. 2021.	A report on the occurrences of cardiac arrest in the in-hospital environment during admissions for childbirth, its characteristics and causes, mortality rate and outcome, verifying the need for more intensive monitoring of pregnant women with comorbidities, thus avoiding possible peripartum complications, observing a possible underreporting of electrocardiographic data to identify the initial rhythm of cardiac arrest, noting the need for a specific database for this situation. It does not address the role of nurses in cardiac arrest.
Thomas M et al.2021.	When checking for CPR in pregnant women in an in-hospital environment, we were faced with the inexperience of the obstetrics team and the difficulty of carrying out simulation training, given that this complication occurs rarely, and that the results for maternal and non-maternal CPR are very similar and the nursing response to CPR does not differ much between them.
Canon V et al. 2022.	The following study points out that CPR in pregnant women is often assisted by advanced life support, reaching the ICU in approximately 20 minutes with fetal survival between the 2nd and 3rd trimester of pregnancy, being a rare event with a poor prognosis for the binomial (mother-fetus) in most cases, reaffirming the importance of intensifying prevention measures, especially in pregnant women with a medical history. The conclusion is that specific knowledge and the correct resuscitation technique are essential for the survival of the mother and the fetus. It does not address the role of nurses in CPR.
Enomoto N et al. 2022.	When comparing the supine position with manual displacement of the uterus to the left for aortocaval decompression and the maternal inclination to perform cardiopulmonary resuscitation during CPR, the first method was found to be more effective, allowing for high-quality compression, but there is a need for further research and records on the survival rate in both cases. Not addressing the role of nurses in CPR
Li P et al.2022.	The case report shows a young woman aged 27, with a gestational age of 39 weeks, with severe abdominal pain and who developed seizures, loss of consciousness and worsening vital signs during labor, and an emergency cesarean section was performed, after the cesarean section, the patient went into cardiac arrest, with return of spontaneous circulation after CPR, and was diagnosed with amniotic fluid embolism with hypotension, hypoxia, coagulopathy followed by cardiac arrest, due to a right hepatic laceration and major bleeding, which occurred after CPR. Not addressing the nurse's role in CPR

Based on the articles studied, the number of studies included in the Virtual Health Library (VHL) on the role of nurses in cardiopulmonary arrest in pregnant women was quantified in a table.

We found 14 articles from the last five years, between 2018 and 2022, in the MEDLINE, Scielo and LILACS databases. A total of 13 articles were found in English and one methodological study in Portuguese. All the articles do not specify the duties of nurses, but they do address clinical practices, actions and incidences in relation to pregnant women with cardiopulmonary arrest. In table 1 describes and quantifies the database in relation to the articles found that respond to the objective of this work.

In table 2 includes a summary of the articles analyzed, which are related to the main objective of this work.

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DISCUSSION

According to a study when dealing with cardiac arrest in pregnant women, we have all the physiological changes that come with pregnancy, such as cardiovascular alterations, which change the approach in some specific areas. It can be seen that the gravid uterus occupies a large part of the pregnant woman's body, so a differentiated approach is needed.[36]

There are differences of opinion regarding the outcome of cardiac arrest in pregnant women, related to whether the outcome is good or bad for the binomial (mother-fetus), about professional knowledge and mastery of the situation and that most of the material studied overlapped with medical care, highlighting the need for studies aimed specifically at this type of complication, which, although rare, affects many women worldwide.[37,38]

It is known that the immediate treatment of cardiac arrest carried out in a technical manner in accordance with the protocol already defined has had a very positive response, but when it comes to cardiac arrest in pregnant women where the outcome is maternal-fetal death, there are few records on the subject and more information is needed so that all the professionals involved in this care know how to handle it correctly.[39,40,41]

The literature on the subject has described the care of pregnant women in cardiac arrest in a globalized way, referring to multidisciplinary work, while a study Construction and validation of an educational video for nursing students on obstetric cardiac arrest, highlights the need for protocols and targeted training for the team to act in this type of incident.[42,43]

According to the report by a study, the role of nurses is extremely important in assessing and supporting CPR, but their ability and care in emergency situations such as CPR in pregnant women is not described in the literature found.[44]

In contrast, a study show that it is extremely important for health professionals to know and identify an emergency situation and that nurses, as part of this team, are responsible for identifying and intervening immediately in cases of CPR during pregnancy. However, this study did not describe the nurse's specific role in dealing with CPR, showing only in general terms that professionals should recognize the problem and intervene immediately.[45,46]

A study confronts the results obtained and cites unfavorable outcomes in the CPR of pregnant women and the lack of nursing preparation in knowing how to act in a maximum of 5 minutes so that a perimortem cesarean section can be performed, preserving maternal survival.[47,48]

A study, on the other hand, brought up the importance of more intensive assessment and monitoring of high-risk pregnant women with comorbidities, thus preventing cardiac arrest from occurring, and also raised the need for echocardiographic records to identify the initial rhythm of cardiac arrest, where underreporting of data aggravates the emergency.[49,50]

Thomas M et al. corroborate Muniz et al. reinforcing the need for staff training in an intra-hospital environment and highlighting the inexperience of staff in dealing with cardiopulmonary arrest in pregnant women.[51,52]

Corroborating Nivatpumin P et al. is Helviz Y et al. who identified the importance of understanding that by recognizing early symptoms that may indicate complications and if the team acts as a whole with skill and adequate knowledge, the final outcome can be modified.[53]

A study points out that specific knowledge and the correct resuscitation technique are essential for the survival of both mother and fetus refer to the supine position with manual displacement of the uterus to the left for aortocaval decompression,[54] which allows high-quality compression, while the maternal inclination to perform Cardiopulmonary Resuscitation in a CPR has not been shown to be as effective, but there is a need for new research and records on the survival rate of both.[55,56,57]

A study gave a pertinent report on CA in pregnant women when there are no factors related to comorbidities and/or physiology and it is necessary to understand the reactions of the woman's body in the gestational period and its response to procedures such as spinal anesthesia in emergency cesarean section and the vaso vagal reaction caused by the Bezold-Jarish reflex (BJR), a cardioinhibitory reflex that includes the triad of bradycardia, hypotension and peripheral vasodilation after spinal anesthesia, which is why it is so important to train the multidisciplinary team (midwives, obstetricians, neonatologists, intensivists) to perform perimortem cesarean sections.[58,59,60]

Comito et al. corroborates Helviz et al. with regard to early airway management and drug complications, since an important cause of cardiac arrest would be anesthetic complications, requiring premature delivery within 4 to 5 minutes, a decision that can change the outcome of cardiac arrest.

This study showed us that there are two extremes when it comes to the subject of pregnancy: following the standard, most pregnancies should occur without complications, or when for some stressful external reason, which can be caused by various types of comorbidities or some unexpected physiological change, cardiorespiratory arrest occurs.[61,62,63]

Understanding the scenario and having the critical eye to act with minimal time and the necessary skill, according to a study, cannot be based on what is currently found in the literature.[64,65,66] We need the professionals involved in this situation to be properly qualified and trained to assist the binomial, thus ensuring

that the entire stop is directed in the right way, with skill on the part of those involved, quick decision- making and with an excellent result Muniz MLC et al.[67,68]

Little has been said about the role of nurses in dealing with cardiac arrest in pregnant women, as they are the professionals who are most often at the forefront of hospital care, receiving the woman and initiating the entire care protocol and leading the other professionals, which is why it is so important and necessary to carry out more studies and training for the entire multidisciplinary team.[69,70]

CONCLUSIONS

In the course of this study, it was observed that cardiorespiratory arrest in pregnant women is a rare event, but one that is difficult to manage, involving the multidisciplinary team that needs to use its knowledge and techniques to save not just one life, but two or more (twins), because in this situation we have the binomial (mother-fetus), It was noted that little of the material found addresses the role of nursing as a professional with a major role to play in the event, and given that it is their professional responsibility to conduct themselves in this situation, there is a need for more study materials, training and greater dissemination of techniques as essential and irrevocable bases for saving lives.

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