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Implementation of Cardiopulmonary Resuscitation in Patients with Cardiac Arrest

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ABSTRACT

Introduction: One of the emergency conditions that can occur anywhere and anytime, is life-threatening, and requires immediate treatment is cardiac arrest. Cardiac arrest is a clinical condition in which circulation stops suddenly, characterized by unconsciousness, respiratory arrest, and the absence of a palpable pulse in the large arteries.
Objective: This case study aims to descriptively explore the implementation of Cardiopulmonary Resuscitation (CPR) in patients experiencing cardiac arrest.
Method: The study was conducted at RS Bhayangkara Makassar, South Sulawesi, on June 24, 2024. Data were collected through direct observation using an observation sheet, focusing on the CPR procedure performed by the medical team. The observation included the sequence of actions, response times, and outcomes of the CPR process. Data were presented in tables and narratives, with strict confidentiality maintained by anonymizing patient information..
Results: Prior to the administration of CPR, patient Mr. A experienced a decrease in consciousness with a GCS score of 4, sudden respiratory arrest, and cardiac arrest. After CPR was performed, Mr. A was declared deceased, with a success rate of CPR at 0%.
Conclusion: Before CPR was performed, there were signs of decreased consciousness, an absent pulse, and no breathing. After the intervention, the patient was declared deceased.

Keywords: cardiac arrest, cardiopulmonary resuscitation, emergency treatment

Introduction

One of the emergency conditions that can occur anywhere, at any time, threaten life, and require immediate treatment is cardiac arrest (Wahyunadi et al., 2021). Cardiac arrest is a clinical condition characterized by the sudden cessation of circulation, marked by unconsciousness, cessation of breathing, and the absence of a pulse in the major arteries. It occurs not only in older adults but also in younger individuals, with the incidence of cardiac arrest on the rise (Cristy et al., 2022).

According to the WHO, the incidence rate of cardiac arrest was around 37% in 2018 and increased to 43% in 2020. In India, this disease has become the leading cause of death, affecting 3.6 million people, or 45% of annual death cases. In both developed and developing countries, cardiac arrest accounts for 60% of all deaths. In Asia, it is estimated that around 350,000 people die each year due to cardiac arrest. According to the South-East Asia Region (SEAR) in 2020, Indonesia ranked 13th among other countries, with a case rate of 26.4% in 2018 (Ngirarung et al., 2020).

Meanwhile, no data has been found regarding the number of cardiac arrest cases in South Sulawesi Province. However, based on the prevalence of heart disease according to doctor diagnoses, South Sulawesi ranks 14th among all provinces in Indonesia, with a case rate of 1.5%. The highest case rate is found in North Kalimantan Province at 2.2%, and the lowest is in Papua Province at 0.9%. According to data from RS Bhayangkara Makassar in 2019, there were 24 cases of cardiac arrest, with a mortality rate of 1.5% (Arfah & Arifin, 2021).

The high mortality rate from cardiac arrest is due to a disruption in the heart's electrical activity, causing the heart to stop suddenly and preventing it from pumping blood throughout the body. As a result, the oxygen needs of the body's vital organs are not met, leading to the absence of a pulse, cessation of breathing, and decreased consciousness. If cardiac arrest is not treated within 4 minutes, it can result in the death of brain cells, and if untreated for more than 10 minutes, it can cause the death of all vital organs in the body. This condition highlights the need for effective emergency treatment of cardiac arrest (Arfah & Arifin, 2021).

The appropriate treatment for handling emergency cases of cardiac arrest is Basic Life Support (BLS). Cardiopulmonary Resuscitation (CPR), commonly known as Resusitasi Jantung Paru (RJP), is a procedure that involves chest compressions and assisted breathing, aimed at restoring and maintaining the function of vital organs in victims of cardiac arrest and respiratory failure. The return and maintenance of vital organ function in cardiac arrest victims who undergo RJP is marked by the occurrence of Return of Spontaneous Circulation (ROSC). ROSC is said to occur when there is evidence of a palpable pulse for 10 minutes, signs of sustained or ongoing circulation, a palpable carotid pulse, and measurable blood pressure (Ari Muji Astutik, 2021).

Another study conducted by Kusumawati & Jaya (2020) titled "Effectiveness of Cardiopulmonary Resuscitation Simulation on the Ability to Manage Cardiopulmonary Resuscitation" found that the earlier CPR is performed, the higher the success rate in managing cardiac arrest. A delay of 1 minute results in a success rate of 98%, a delay of 3 minutes results in a success rate of 50%, and a delay of 10 minutes results in a success rate of 1%. Therefore, prompt intervention is crucial and achievable.

Objective

This case study aims to descriptively explore the implementation of Cardiopulmonary Resuscitation (CPR) in patients experiencing cardiac arrest.

Method

This case study aims to descriptively explore the implementation of Cardiopulmonary Resuscitation (CPR) in patients experiencing cardiac arrest. The study was conducted at RS Bhayangkara Makassar, South Sulawesi, on June 24, 2024. Data were collected through direct observation using an observation sheet, focusing on the CPR procedure performed by the medical team. The observation included the sequence of actions, response times, and outcomes of the CPR process. Data were presented in tables and narratives, with strict confidentiality maintained by anonymizing patient information.

Result

Table 1. Assessment of external characteristics before and after the administration of Cardiopulmonary Resuscitation (CPR)

Cardiac Arrest Assessment	Output of the RJP Results	
	Before	After
Frequency Pulse	150x/menit	0
Respiratory rate	40x/menit	0
SPO2	78 %	0
Level of consciousness (GCS)	Semi coma (4)	Passed away
Pupil reflex	Isokor	An-isokor

Discussion

Based on the case study conducted on Mr. "A" for the administration of Cardiopulmonary Resuscitation (CPR) to a patient experiencing cardiac arrest in the Emergency Department of RS Bhayangkara Makassar.

Patient's Response Before the Administration of Cardiopulmonary Resuscitation (CPR)

Before the administration of CPR on Thursday, July 4, 2024, at 00:30, Mr. A was brought by his family to the Emergency Department due to decreased consciousness, with a Glasgow Coma Scale (GCS) score of 4, and sudden respiratory and cardiac arrest. The main issue in patients with cardiac arrest is coronary heart disease, which causes a disturbance in the heart's rhythm known as ventricular fibrillation. This condition leads to the heart malfunctioning, halting its pumping action due to an electrical disturbance in the organ, thereby stopping the blood flow throughout the body. According to Cristy et al. (2022), to understand the implementation of CPR for cardiac arrest patients in the emergency department, the study shows that CPR is a method of assistance aimed at restoring respiratory and circulatory functions in individuals experiencing cardiac arrest. Cardiac arrest events require CPR actions that are essential for saving lives in emergencies.

Patient's Response After the Administration of Cardiopulmonary Resuscitation (CPR)

After CPR was administered to Mr. A on Thursday, July 4, 2024, at 00:35, there was no response, the carotid pulse was not palpable, and there was no breathing after 5 cycles of resuscitation actions. This aligns with the research of Ghifari et al. (2022), which states that very few patients survive after CPR when cardiac arrest is caused by conditions other than heart disease or organ dysfunction. The patient's life expectancy after CPR is very low. Based on the research findings by Suleman (2023), if resuscitation fails, the resulting loss leads to

unfavorable consequences, indicating that performing actions without a meaningful purpose is ineffective and unsuccessful.

After performing CPR, Mr. A was declared dead, as evidenced by a CPR success rate of 0%. Furthermore, the study by Sommeng et al. (2023) on CPR implementation showed that the rescuer performed chest compressions with a depth of 5-6 cm and 30 compressions within two minutes. This condition often causes rescuers to experience physical fatigue more quickly. Generally, physical fatigue is felt after just 1 minute of performing chest compressions, but rescuers may not notice it. To maintain and prevent a decline in the quality of CPR, rescuers should alternate performing chest compressions every 2 minutes when 2-3 rescuers are available. This is done to maintain the function of the heart.

Conclusion

Based on the results of the case study conducted by the author on the "Implementation of Cardiopulmonary Resuscitation in Cardiac Arrest Patients" on July 4, 2024, at RS Bhayangkara Makassar, it can be concluded that before CPR was performed, signs of decreased consciousness, absent pulse, and no breathing were observed. After CPR was performed, patient Mr. A was declared dead, with no response after 5 cycles of CPR. It is evident that much needs to be done to improve the success rate of CPR for cardiac arrest in hospitals. This improvement requires not only specific techniques and rapid response systems but also better guidance on advanced life support decisions at the end of life.

Conflict of interest

The researchers stated that there is no conflict of interest related to the implementation and publication of the results of this research. The entire research process, from planning, data collection, analysis, to report preparation, was carried out independently without any influence or pressure from any third party. A commitment to research ethics is upheld throughout the research process, ensuring transparency, accuracy and honesty in reporting results. Respondents' participation was voluntary with informed consent, and their confidentiality and privacy were maintained in accordance with applicable research ethics standards. With this statement, researchers hope that the research results can be trusted and used as a valid reference for the development of science and health practices related to ethnomedicine and reproductive health.

Authors' contribution

Each author makes an equal contribution to all parts of the research. All authors have reviewed and approved the final draft critically and are responsible for the index and similarity of the manuscript.

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