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REVIEW ARTICLE

Nursing care practices in the face of neurogenic shock in the trauma context

Prácticas de cuidados de enfermería ante el shock neurogénico en el contexto traumatológico

Práticas assistenciais do enfermeiro frente ao choque neurogênico no contexto do trauma

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Abstract

This study aimed to describe the most effective nursing interventions for neurogenic shock episodes, as described in the literature, during care at the Trauma Center, and to identify the difficulties nurses face in managing neurogenic shock cases during care at the Trauma Center. A qualitative literature review with an exploratory approach was conducted, analyzing five articles after applying inclusion and exclusion criteria. The data obtained from the analysis of the selected materials show the importance of using the ABCDE method and the Nursing Process in initial care at the Trauma Center, highlighting the importance of standardized protocols for more precise identification of the signs and symptoms of neurogenic shock. It also reveals the nurses' difficulty in identifying neurogenic shock due to a lack of knowledge since their undergraduate studies, and the importance of the nurse in preventing secondary injuries. The need for ongoing training for nurses in the Trauma Center was verified, as well as the need for neurogenic shock to be discussed more in nursing undergraduate programs, and how the ABCDE protocol and the Nursing Process can minimize diagnostic errors, helping nurses to reduce the incidence of secondary injuries in patients suffering from neurogenic shock.

Descriptors: Neurogenic Shock; Interventions; Nurse; Urgencies and Emergencies; Traumatology.

Resumén

Este estudio tuvo como objetivo describir las intervenciones de enfermería más efectivas para los episodios de shock neurogénico, según lo descrito en la literatura, durante la atención en el Centro de Trauma, e identificar las dificultades que enfrentan las enfermeras en el manejo de estos casos. Se realizó una revisión cualitativa de la literatura con un enfoque exploratorio, analizando cinco artículos tras aplicar criterios de inclusión y exclusión. Los datos obtenidos del análisis de los materiales seleccionados demuestran la importancia del método ABCDE y del Proceso de Enfermería en la atención inicial en el Centro de Trauma, resaltando la importancia de los protocolos estandarizados para una identificación más precisa de los signos y síntomas del shock neurogénico. Asimismo, se evidencia la dificultad de las enfermeras para identificar el shock neurogénico debido a la falta de conocimientos adquiridos durante su formación universitaria y la importancia de su papel en la prevención de lesiones secundarias. Se verificó la necesidad de capacitación continua para el personal de enfermería en el Centro de Trauma, así como la necesidad de abordar con mayor profundidad el choque neurogénico en los programas de pregrado de enfermería y cómo el protocolo ABCDE y el Proceso de Enfermería pueden minimizar los errores diagnósticos, ayudando al personal de enfermería a reducir la incidencia de lesiones secundarias en pacientes con choque neurogénico.

Descriptores: Choque Neurogénico; Intervenciones; Enfermería; Urgencias y Emergencias; Traumatología.

Resumo

Objetivou-se descrever as intervenções de enfermagem mais eficazes dos episódios de choque neurogênico, descritos na literatura, durante o atendimento no Centro de Trauma e identificar as dificuldades do enfermeiro no manejo dos casos de choque neurogênico durante o atendimento no Centro de Trauma. Revisão de literatura qualitativa com abordagem exploratória, que, após os critérios de inclusão e exclusão, analisaram-se cinco artigos. Os dados obtidos através da análise dos materiais selecionados mostram a importância da utilização do ABCDE e da SAE no atendimento inicial no Centro de Trauma, mostram a importância de protocolos padronizados para uma identificação mais precisa dos sinais e sintomas do choque neurogênico. Mostra a dificuldade do enfermeiro na identificação do choque neurogênico devido a uma falta de conhecimento desde a graduação e mostra a importância do enfermeiro na prevenção das lesões secundárias. Verificou-se a necessidade de capacitação continuada para enfermeiros no Centro de Trauma, a necessidade do choque neurogênico ser mais discutido nas graduações de enfermagem, como o protocolo ABCDE e a SAE podem minimizar erros de diagnóstico, auxiliando o enfermeiro a diminuir a incidência de lesões secundárias no paciente vítima de choque neurogênico.

Descritores: Choque Neurogênico; Intervenções; Enfermeiro; Urgências e Emergências; Traumatologia.

Introduction

Shock is defined by a set of signs and symptoms that result in acute circulatory failure, leading to ineffective oxygen delivery to the tissues, causing systemic disturbances and resulting in tissue hypoperfusion, lactic acidosis, and systemic inflammation[1]. Tissue hypoxia has devastating consequences for the body, as it causes metabolic and cellular impairment, reducing vital functions and followed by a compensatory response from the cardiovascular system, which aims to maintain vascular tone and cardiac function performance[2].

The pathophysiology of shock encompasses several mechanisms that, combined, result in a specific type of shock, such as hypovolemic factors, cardiogenic factors, obstructive factors, and distributive factors. For better identification of the type of shock, a thorough medical history is necessary, including analysis of the triggering event, paying attention to specific signs for a more precise diagnosis[3].

In 1998, Marson et al.[4] classified distributive shock as vasodilation that causes a reduction in systemic vascular resistance, thus causing hypovolemia and consequently compromising cardiac output. Mourão-Junior et al.[1] define distributive shock as a global vasodilation of peripheral vessels, resulting in tissue hypoperfusion and a drastic reduction in vascular filling pressure, thus resulting in compromised oxygen distribution by the capillaries and deficient oxygen uptake by the tissues.

Distributive shock encompasses three types of shock: septic shock, anaphylactic shock, and neurogenic shock. Its distinctive signs and symptoms are primarily characterized by persistent hypotension even after fluid resuscitation, leading to generalized systemic hypoxia[5].

Still in 1998, Marson et al.[4] neurogenic shock is described as a clinical condition primarily caused by spinal cord trauma, resulting in severe hypotension, loss of sympathetic tone, and exacerbation of hypovolemia. Its clinical presentation is mainly characterized by arterial hypotension without tachycardia or peripheral vasoconstriction.

Mourão-Junior et al.[1] describe neurogenic shock as tissue hypoperfusion due to a sudden loss of vascular tone; that is, the peripheral cardiovascular system loses its ability to contract, which is regulated by the autonomic nervous system. This vascular tone is extremely important for stabilizing systemic blood pressure and capillary filling pressure. In 2024, Laura et al.[6] describe neurogenic shock as a recurring outcome seen in spinal cord injuries, especially if these lesions are high in the spine, with a focus on the cervical region. This phenomenon is directly linked to a drop in systemic blood pressure and heart rate, resulting in poor oxygen distribution and causing systemic hypoxia.

The most common cause of neurogenic shock is spinal cord trauma, primarily above the thoracic level of the vertebral column. This can range from car accidents and falls to acts of violence, gunshot or stab wounds, sports activities, or any situation that could cause injury to the spinal cord tissue. A good prognosis depends on a thorough medical history and accurate diagnosis. It also depends on the extent and level of the injury and the response to treatment. Therefore, early diagnosis and treatment result in a good prognosis, thus reducing secondary injuries, which are often permanent or fatal neurological damage[7].

A thorough medical history is extremely important for understanding the extent of trauma, recognizing its complexity, and initiating specific nursing care to minimize secondary injuries. The nursing process directly contributes to improving the patient's clinical condition, as well as reducing trauma morbidity and mortality. The importance of individualized assessment by the bedside nurse is highlighted, favoring a specific and effective approach to achieving a good prognosis for the patient. This emphasizes the importance of bedside nurses in the care of patients in Trauma Centers[8].

The objectives of this research were to describe the most effective nursing interventions for neurogenic shock episodes, as described in the literature, during care at the Trauma Center, and to identify the difficulties faced by nurses in managing neurogenic shock cases during care at the Trauma Center.

This study is justified because spinal cord injuries are one of the leading causes of morbidity and mortality observed in emergency rooms and surgical centers of trauma referral centers. "The annual incidence varies between 15 and 52 cases per million people worldwide. About 80% are young men between 15 and 35 years of age. Neurological functional impairment is frequently found, and the most common are tetraplegia (53%) and paraplegia (42%)"[3].

Furthermore, Sousa et al.[7] research highlights the deficient knowledge of nurses regarding the clinical situation of neurogenic shock in their region, which is weakened, as well as the evident lack of preparedness of these nurses to deal with this diagnosis, despite them being the professionals at the forefront of the trauma unit. This raises academic concerns about the clinical practices of nurses in the face of this type of shock and how they intervene to improve prognosis and reduce the incidence of secondary injuries that have permanent consequences for victims of this clinical condition.

Therefore, it becomes relevant because the identification and management of neurogenic shock through nursing interventions contribute to a better patient prognosis, stabilizing circulation and neurological function, minimizing the possibility of permanent secondary injuries and death. Thus, effectively optimizing care in the Trauma Center directly impacts the quality of life of patients who are victims of this type of shock.

Methodology

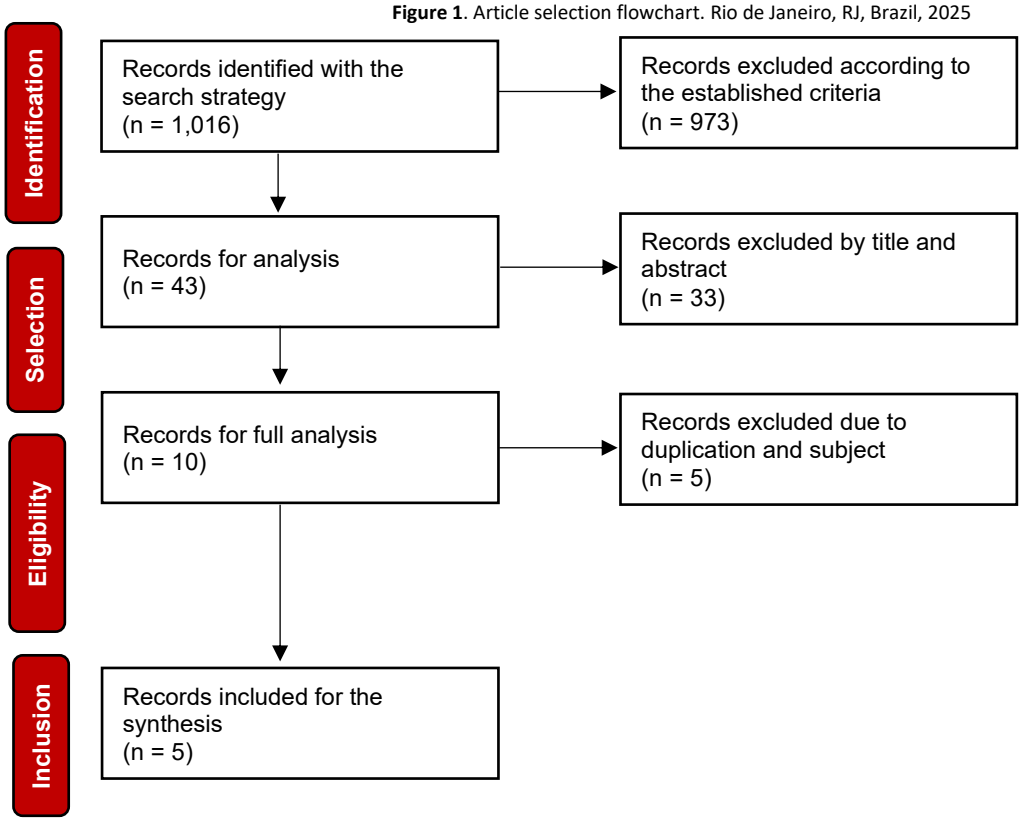
This study is a qualitative narrative literature review with an exploratory approach. A narrative literature review is defined as a methodology that involves analyzing research based on previously published materials. It consists of searching for broader aspects that provide sufficient material to adequately answer the problem. This type of research typically uses printed materials such as magazines,

newspapers, books, theses, monographs, dissertations, and proceedings of scientific events[9].

According to Gil[10], an exploratory review is broader in its consideration of various variables concerning the situation being researched. Its main objective is, in fact, to encompass and refine ideas and hypotheses, making the problem more evident and open to constructing answers through its diverse research sources. In its entirety, an exploratory review utilizes the following methods: bibliographic research, field studies with people who have had practical experience with the problem being researched, and case study analyses that aid in understanding the problem.

The guiding question was developed using the PICo strategy, which is defined as a methodological tool for formulating qualitative research questions in the health field, structuring the guiding question clearly and objectively, facilitating the search in databases[11]; being: Population (P) of nurses working in the trauma center, Interest (I) in interventions and strategies for assisting neurogenic shock, and Context (Co) of bedside care in the trauma center. Thus, the question is: "What strategies can the nurse adopt for more effective care when faced with a diagnosis of neurogenic shock at the bedside in the Trauma Center?".

Figure 1. Article selection flowchart. Rio de Janeiro, RJ, Brazil, 2025



For this research, the bibliographic survey method was chosen as a resource to answer the research objectives. The Virtual Health Library (VHL) and Google Scholar were used as search bases, and the Scientific Electronic Library Online (SciELO), the Medical Literature Analysis and Retrieval System Online (MEDLINE), the Latin American Literature in Health Sciences (LILACS), and the Nursing Databases (BDENF) were used as databases. During the search in the VHL database, insufficient materials were found to answer the guiding question or the objectives. Therefore, the search conducted in Google Scholar was relatively satisfactory and sufficient to answer the research question.

To refine and qualify the results found, the following Health Sciences Descriptors (DeCS) were applied: Spinal Cord Injury, spinal cord trauma, trauma, care practices, and nurse, in addition to the keyword neurogenic shock, associated with the use of the Boolean operator "AND" to relate them to each other, resulting in 1,016 articles. The inclusion criteria were applied: free studies, published in full, in Portuguese and English, in the last 10 years, and original, leaving 43. In a brief analysis, 33 were excluded due to the title and abstract, leaving 10 studies. Next, the filtered materials were read, and the exclusion criteria were applied, namely: studies that do not address the proposed theme or are duplicates, leaving five articles for further analysis. Consequently, the final selected studies were characterized in a specific table and their contents analyzed in a way that answers the research objectives.

Results and Discussion

Based on the selection made after the search, five studies were chosen for synthesis, which can be presented in Chart 1.

Chart 1. Characterization of the five selected studies. Rio de Janeiro, RJ, Brazil, 2025

Subgroup	Title	Year	Authorship	Type of study	Objectives	Results
Neurogenic shock and nursing strategies	Choque neurogênico: implicações para a prática de enfermagem no cenário de emergência	2017	Oliveira RP et al.	Applied technical-scientific article	Review the pathophysiology, clinical presentation, and nursing management of neurogenic shock.	Practical guidelines for pre-hospital and in-hospital settings, focusing on the ABCDE protocol and clinical stabilization.
Spinal cord injury and nursing care	Assistência de enfermagem no trauma raquimedular: uma revisão integrativa da literatura	2021	Oliveira GS et al.	Integrative literature review	Portray nursing care in spinal cord injury.	Nurses work in the field from trauma to rehabilitation; emphasis is placed on technical training.
Rehabilitation and the acute phase of spinal cord injury	Cuidados de enfermagem em contexto agudo à pessoa com lesão medular: scoping review	2022	Sousa SS et al.	Scope review	Map areas of nursing practice in the acute phase of spinal cord injury.	Mapping interventions in the acute phase; focuses on well-being and autonomy.
Neurogenic shock and systematization of care	Percepção e vivência de enfermeiros frente ao choque neurogênico: uma análise da sistematização da assistência de enfermagem	2023	Sousa AO et al.	Qualitative and exploratory study	Analyze the experiences of nurses regarding neurogenic shock and the Nursing Process.	Knowledge deficit regarding neurogenic shock; importance of the Nursing Process.
General classification of shock types	O estado de choque: classificação e estratégias iniciais de manejo	2025	Lisboa TMXC et al.	Narrative review	Analyze the concepts and initial management of different types of shock.	The importance of early recognition and application of the ABCDE protocol.

The Challenges of Technical Knowledge Identified Regarding Neurogenic Shock

Although neurogenic shock is a highly relevant clinical condition in trauma centers, many difficulties still exist regarding pathology, as is rarely discussed during undergraduate studies, causing significant insecurity among nurses regarding technical and scientific knowledge, identification of the pathology, and bedside management of patients in this condition. According to Sousa et al.[7], there is a considerable number of nurses working in Trauma Centers who describe their difficulties in dealing with the signs and symptoms of neurogenic shock, which can directly and negatively affect clinical decision-making for patient management, potentially causing harm, secondary injury, or even death.

This lack of knowledge about pathology is directly linked to the fact that, during undergraduate studies, neurogenic shock is not addressed in a more specific and in-depth way. The focus of the discipline that addresses shock is on situations and pathologies that are more recurrent within the hospital setting, being more specific in hypovolemic or septic shock, whose clinical manifestations are more recurrent, obvious, with a pattern and easy identification. However, neurogenic shock stands out for presenting arterial hypotension without compensatory tachycardia and absence of peripheral vasoconstriction, specific characteristics that can delay its diagnosis, potentially hindering its initial treatment[1,4].

The lack of training among nurses to recognize and prescribe specific nursing diagnoses and care to intervene in these cases can lead to irreversible secondary injuries and even patient death. Therefore, continuing education and training programs must address neurogenic shock more thoroughly, using clinical cases and discussions that clearly specify this difficult-to-diagnose pathology to fill the gap that has existed since undergraduate studies.

The Importance of Rapid and Systematic Interventions and Care Practices

The ABCDE protocol is widely used as an essential method in the initial management of patients in shock, including neurogenic shock. Applying this method in the Trauma Center during initial care directly assists the nurse, enabling them to prioritize specific actions, with particular nursing diagnoses and nursing actions to correctly manage the patient, thus stabilizing them hemodynamically and preventing the exacerbation of the patient's signs and symptoms, consequently contributing to a good prognosis[12,13]. However, the effectiveness of this professional depends on their clinical knowledge and daily practice, which highlights the need for regular training and case studies to expand their knowledge.

When the ABCDE protocol is applied correctly, it directly assists in the early identification of risks, as the protocol aims to observe 5 essential points for the patient's organic functioning: A: Airway, B: Breathing, C: Circulation, D: Disability, and E: Exposure. Maintaining an unobstructed

airway and ensuring that the patient is receiving adequate and sufficient oxygenation are priorities in a case of neurogenic shock, due to the risk of respiratory depression caused by loss of autonomic tone.

The protocol also assists in the effective management of other complications such as severe bradycardia and persistent hypotension, which are common in neurogenic shock. Oliveira et al.[13] emphasize that the use of the ABCDE protocol should be a recurring part of the daily routine for nurses in Trauma Centers, ensuring effective and coordinated action in this clinical situation.

However, the challenge highlighted in the literature is ensuring that team members are equally trained to execute the protocol efficiently. This requires a multidisciplinary approach and the implementation of clear and objective institutional protocols, standardizing procedures, and guaranteeing the effectiveness of care.

The Nurse in the Prevention of Secondary Injuries

The nurse plays a fundamental role in patient care within the Trauma Center, especially regarding the prevention of secondary shock injuries. The nurse has the most direct contact with the patient due to their constant bedside management, so this care must be meticulous and is extremely important for the patient's successful recovery. According to Sacramento et al.[8], continuous care and rigorous monitoring of vital signs are essential to observe and address any clinical changes early, such as a drop in blood pressure and a decrease in heart rate. Constant monitoring of this patient allows for a faster and more effective approach, preventing more serious repercussions and improving the patient's prognosis.

Sousa et al.[7] discuss the Nursing Care Systematization (SAE) and how this systematization helps to provide structured and more organized care, which is standard practice in situations like this. SAE allows professionals to develop an individualized care plan, addressing the unique needs of each patient, encompassing everything from monitoring vital signs to early mobilization when prescribed. SAE also reinforces the need for documenting interventions, ensuring that information about these care interventions is passed on concisely to the rest of the team, promoting quality communication between teams, not only nursing but also multidisciplinary.

Sousa et al.[14] also discussed the importance of looking at the patient individually, paying attention to the context and their needs, and assisting them according to their individual demands. In this way, the professional can create a bond with the patient, often reassuring them and reducing emotional stress, thus promoting more humanized and less "task-oriented" care. Creating care protocols that integrate the Nursing Process with the management of neurogenic shock can ultimately improve the safety of professionals regarding effective clinical practice, avoiding unsafe and ineffective care practices.

However, there are challenges in the practical application of the concepts mentioned above, even with well-defined and established guidelines. The absence of specific protocols and minimal adherence to standardized practices result in varied bedside management, with different guidelines for each patient. Oliveira et al.[15] suggest investing in the development of specific clinical protocols for the nursing team, thus directly contributing to reducing discrepancies in care and promoting better outcomes.

Conclusion

During the analysis of the materials selected for this research, crucial points were observed, the main one being how the effective performance of the nurse is directly linked to the early recognition of the clinical signs of neurogenic shock. However, the deficiency in technical knowledge about this clinical condition, associated with the lack of specific institutional nursing protocols regarding this pathology, presents itself as a significant challenge in nursing care practices.

The use of standard protocols, such as ABCDE, has made it clear how standardization of care at the Trauma Center is effective in organizing more targeted nursing actions. Therefore, the initial protocol is used, ensuring systematized and agile management in the initial care of this patient. The use of ABCDE has proven effective in several ways, including quickly identifying the patient's clinical priorities; hemodynamic stabilization; and reduction of secondary injuries during patient mobilization, promoting more targeted care and favorable prognosis for the patient.

The application of the Nursing Care System (SAE) also contributes to more individualized and structured care, seeking to analyze the patient and the entire context of the trauma. This allows for more targeted interventions and more specific and continuous care, which is of paramount importance for patients who are victims of neurogenic shock. The SAE increases and strengthens communication both within the team and across multiple disciplines, ensuring continuity of care in a homogeneous manner and improving the quality of assistance provided.

Considering this, the need for investment in the continuous training of nurses in Trauma Centers intensifies, addressing neurogenic shock in a more in-depth manner. Similarly, a less superficial approach to this type of shock is needed in nurse training, increasing their knowledge of this condition with more concepts and dynamics involving clinical cases to minimize discrepancies in the identification of signs and improve care for these patients in the Trauma Center.

Therefore, we can conclude that the most effective strategies for managing neurogenic shock in the context of trauma involve ongoing technical training for identifying signs and symptoms and more targeted care, the application of care protocols such as ABCDE, and the structured use of the Nursing Process so that the victim receives more centralized care. Improving each of these points can positively impact the reduction of morbidity and mortality and promote safe, targeted, and qualified care for patients who are victims of spinal cord injuries.

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