(ISSN: 3085-6124)
Cognitus Interdisciplinary Journal

ADVANCED AND MULTIDISCIPLINARY STRATEGIES IN THE MANAGEMENT OF CRITICALLY ILL NEUROCARDIOLOGICAL PATIENTS

Estratégias Avançadas E Multidisciplinares No Manejo De Pacientes Neurocardiológicos Críticos

ABSTRACT

This study analyzes advanced and multidisciplinary therapeutic strategies in the management of critically ill neurocardiological patients, whose clinical condition requires coordinated interventions between neurology, cardiology and intensive care medicine. It is an integrative review based on recent evidence extracted from the scientific literature, with an emphasis on hemodynamic and neurological monitoring practices, innovative technologies, the use of biomarkers, assisted ventilation and risk management by multi-professional teams. The results indicate that integrating these approaches contributes significantly to reducing cardiovascular and neurological complications, improving clinical outcomes and optimizing therapeutic response in Intensive Care Units (ICUs). It is concluded that the effective management of critically ill neurocardiological patients requires the adoption of approaches based on integrated protocols, continuous support and personalization of care, standing out as an essential field for the advancement of contemporary intensive care medicine.

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KEYWORDS: Comprehensive Care; Cardiopathies; Critical Care; Neurocardiology; Intensive Care Units

(ISSN: 3085-6124)
Cognitus Interdisciplinary Journal

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Received: [12-05-2025]
Published on: [13-05-2025]

RESUMO

Este estudo analisa estratégias terapêuticas avançadas e multidisciplinares no manejo de pacientes neurocardiológicos críticos, cuja condição clínica demanda intervenções coordenadas entre neurologia, cardiologia e medicina intensiva. Trata-se de uma revisão integrativa baseada em evidências recentes extraídas da literatura científica, com ênfase em práticas de monitoramento hemodinâmico e neurológico, tecnologias inovadoras, uso de biomarcadores, ventilação assistida e gestão de risco por equipes multiprofissionais. Os resultados indicam que a integração dessas abordagens contribui significativamente para a redução de complicações cardiovasculares e neurológicas, melhora dos desfechos clínicos e otimização da resposta terapêutica em Unidades de Terapia Intensiva (UTIs). Conclui-se que o manejo eficaz de pacientes neurocardiológicos críticos requer a adoção de condutas baseadas em protocolos integrados, suporte contínuo e personalização do cuidado, destacando-se como um campo essencial para o avanço da medicina intensiva contemporânea.

PALAVRAS-CHAVES: Assistência Integral; Cardiopatias; Cuidados Críticos; Neurocardiologia; Unidades de Terapia Intensiva

INTRODUCTION

Cardiovascular diseases and neurological disorders are among the main causes of morbidity and mortality in the world and represent a growing challenge for health systems, especially when they manifest themselves in an interdependent way in the context of neurocardiology. This emerging area of medicine investigates the complex interaction between the central nervous system and the cardiovascular system, showing that conditions such as stroke, epilepsy, encephalopathy and traumatic brain injury can trigger severe cardiac dysfunction, while acute cardiac events can also affect brain function. In critically ill patients, this relationship becomes more delicate, requiring therapeutic approaches that are both rapid, coordinated and highly specialized [1,2]

The growing complexity of clinical cases, the need for intensive monitoring and the interdependence between multiple specialties justify the adoption of advanced, multidisciplinary strategies in the management of these patients [3]. Integrated protocols between neurologists, cardiologists, intensivists and other health professionals are essential for hemodynamic stabilization, prevention of neurological sequelae and improved clinical outcomes [4]. However, there are still important gaps in the standardization of procedures, the formation of interdisciplinary teams and the incorporation of assistive technologies to optimize care.

Given this scenario, the main objective of this study is to analyze the advanced and multidisciplinary therapeutic strategies used in the management of neurocardiological patients in critical condition.

RESULTS AND DISCUSSION

Chart 1 presents a systematization of the most relevant strategies used in critical neurocardiology, highlighting their approaches, benefits and author/year. The topics range from hemodynamic and neurological monitoring to the use of innovative technologies and the implementation of multidisciplinary strategies to improve the clinical outcomes of ICU patients. Each strategy has been analyzed on the basis of recent scientific evidence , providing an up-to-date overview of best practices in the management of critically ill neurocardiological patients.

Table 1 Systematization of results

TOPIC	STRATEGY	BENEFIT	AUTHOR/YEAR
Hemodynamic and Neurological Monitoring and Control	Continuous hemodynamic monitoring and blood pressure control	Reduction of cardiovascular complications and clinical improvement	BATTAGLINI et al., 2020[5]
Hemodynamic and Neurological Monitoring and Control	Early recognition of signs of neurocardiological dysfunction	Reduced complications and improved clinical stages	BASHAW; TRIPLETT, 2017[6]
Hemodynamic and Neurological Monitoring and Control	Continuous monitoring of cardiovascular and metabolic function	Minimization of complications and improvement in the ICU	BASHAW; TRIPLETT, 2017[7]
Innovative Technologies and Personalized Approaches	Use of specific biomarkers and advanced technologies	Optimization of early detection and clinical improvement	BUCCISANO; HOURIGAN; WALTER, 2017[8]
Innovative Technologies and Personalized Approaches	Optimization of systemic homeostasis and control of cerebral perfusion	Improvement in clinical and functional stages	SALIH et al., 2022(9)
Innovative Technologies and Approaches	Continuous monitoring of neurological and hemodynamic changes	Reduced morbidity and mortality	DE JESUS et al., 2023[10]
Multidisciplinary Strategies and Risk Management	Adequate ventilatory support and rapid management of complications	Reduced mortality in critically ill patients	COX et al., 2018[11]
Multidisciplinary Strategies and Risk Management	Early recognition of complications and escalation of care	Improved clinical outcomes and rapid response	GROSS et al., 2023[12]
Multidisciplinary Strategies and Risk Management	Monitoring neurological and hemodynamic status	Improvement in clinical stages and prevention of complications	ZHONG; GONG, 2017[13]
Multidisciplinary Strategies and Risk Management	Risk stratification and the use of modern forecasting tools	Risk reduction and clinical advances	CLEMENTS; GASKINS; MARTIN, 2023[14]

Source: Authors, 2025.

Hemodynamic and Neurological Monitoring and Control

The most recommended strategies include continuous hemodynamic monitoring in the ICU for early detection of cardiovascular dysfunction, strict blood pressure control with labetalol, nicardipine or nitroprusside, use of beta-blockers to prevent cardiac remodeling and treat arrhythmias, as well as correction of electrolyte imbalances and immediate treatment of abnormal rhythms. These approaches reduce cardiovascular complications and improve clinical stages [5]

Similarly, other effective strategies include early recognition of signs of neurocardiological dysfunction, continuous hemodynamic monitoring and laboratories, specific coagulation control to prevent thrombotic or hemorrhagic events, and cardiovascular

stabilization with adequate hemodynamic support. In this way, early intervention reduces complications and improves clinical outcomes in the ICU [6]

In addition, continuous monitoring of cardiovascular and metabolic function is essential, along with specific control of blood glucose to reduce cardiovascular complications. The use of therapies for hemodynamic stabilization and prevention of thrombotic events, as well as optimizing the treatment of risk factors such as hypertension and dyslipidemia, are also essential. These approaches minimize complications and improve clinical stages in the ICU [7]

Innovative Technologies and Personalized Approaches

The most advanced strategies include continuous hemodynamic and neurological monitoring, the use of specific biomarkers for early detection of cardiac dysfunction, a personalized approach based on individual risk factors, and the integration of innovative technologies such as artificial intelligence and high-precision imaging methods. These interventions optimize early detection and improve clinical stages in the ICU [8]

In the same vein, the optimization of systemic homeostasis to prevent secondary brain damage, specific control of intracranial pressure and cerebral perfusion, as well as the management of cardiorespiratory complications associated with ischemic stroke stand out. Teams specialized in neurointensivism contribute to improvements in clinical and functional stages in the ICU [9]

At the same time, continuous monitoring of neurological and hemodynamic alterations, strict control of noise levels and mechanical ventilation to avoid complications, as well as prevention and early management of infections and cardiovascular instability, have proven to be fundamental. The work of multidisciplinary teams optimizes therapeutic decisions, reducing morbidity and mortality in neurocardiologically critical patients in the ICU [10]

Multidisciplinary Strategies and Risk Management

Adequate ventilatory support to improve cerebral oxygenation, the rapid identification and management of secondary complications, such as liver damage or metabolic disorders, and the participation of specialized multidisciplinary teams guarantee precise interventions and reduce mortality in neurocardiologically critical patients in the ICU [11]

On the other hand, early recognition of complications through continuous monitoring, rapid escalation of care with support from intensivists and specialists, proactive management of risk factors and strengthening of the multidisciplinary team ensure an agile and effective response. These approaches reduce morbidity and improve clinical outcomes in the ICU [12]

In addition, continuous monitoring of neurological and hemodynamic status, early detection of signs of encephalopathy and risk of cerebral hemorrhage, specific control of metabolic disorders and inflammation associated with systemic conditions and rapid intervention by multidisciplinary teams improve the clinical stages of the ICU [13].

Finally, strategies such as risk stratification based on frailty and comorbidities, early interventions to prevent serious complications and the use of modern forecasting tools allow the identification of high-risk patients and the direction of personalized conduct in the ICU. Such measures improve clinical outcomes and reduce risks [14]

Thus, an integrated approach, involving continuous monitoring, early management of complications and multidisciplinary support, is essential to optimize treatment and reduce morbidity and mortality in critically ill neurocardiological patients in the ICU [15,16]

CONCLUSION

This study sought to analyze advanced, multidisciplinary therapeutic strategies applied to the management of critically ill neurocardiological patients, showing that the integration of continuous hemodynamic and neurological monitoring, the use of innovative technologies and the work of multi-professional teams is fundamental to reducing complications and improving clinical outcomes in intensive care units. The research answers the central question in the affirmative, demonstrating that these strategies, when well implemented, promote faster, more personalized and effective interventions. The results obtained reinforce the importance of care centered on the complexity of the interactions between the neurological and cardiovascular systems, contributing to the advancement of clinical practice, the formation of institutional protocols and the improvement of critical hospital care.

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