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REVIEW PROTOCOL

Nursing care for cytoreduction and HIPEC in critically ill patients: a scoping review protocol

Cuidados de enfermagem para citorredução e HIPEC em pacientes críticos: um protocolo de scoping review

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ABSTRACT

Objective: Mapping of postoperative nursing care indicated for adult and elderly critically ill patients hospitalized in intensive care units (ICUs) after Cytoreductive Surgery (CRS) with *hyperthermic intraperitoneal chemotherapy (HIPEC)*. **Method:** This is a scoping review protocol using the Joanna Briggs Institute methodology to address the research question "What postoperative nursing care is indicated for adult and elderly critically ill patients admitted to the ICU after cytoreductive surgery with HIPEC?". Evidence sources will be extracted from the Medical Literature Analysis and Retrieval System Online (MEDLINE), Cumulative Index to Nursing & Allied Health (CINAHL), SCOPUS, Embase, Biblioteca Virtual em Saúde (BVS), Cochrane Central Register of Controlled Trials (CENTRAL), and Web of Science. The Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) checklist will be used to ensure the quality and transparency of reporting. Two independent researchers will perform all the steps using EndNote® and Rayyan®. The results extracted from the included studies will be presented in a descriptive narrative form.

Descriptors: Cytoreduction Surgical Procedures; Hyperthermic Intraperitoneal Chemotherapy; Intensive Care Units; Postoperative Period; Nursing Care.

RESUMO

Objetivo: Mapear os cuidados de enfermagem pós-operatórios indicados para os pacientes críticos adultos e idosos internados em Unidade de Terapia Intensiva (UTI) após cirurgia de citorredução com *hyperthermic intraperitoneal chemotherapy* (HIPEC). **Método:** Trata-se de um protocolo de *scoping review* no método *Joanna Briggs Institute*, abordando a questão de pesquisa "quais os cuidados de enfermagem pós-operatórios indicados aos pacientes críticos adultos e idosos internados em UTI após cirurgia de citorredução com HIPEC?". As fontes de evidência serão extraídas das bases *Medical Literature Analysis and Retrieval System Online* (MEDLINE), *Cumulative Index to Nursing & Allied Health* (CINAHL), SCOPUS, Embase, Biblioteca Virtual em Saúde (BVS), *Cochrane Central Register of Controlled Trials* (CENTRAL) e *Web of Science*. A fim de garantir a qualidade e transparência da redação, será aplicado o *Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews* (PRISMA-ScR) *Checklist*. Todas as etapas ocorrerão através de dois pesquisadores independentes, utilizando o *EndNote*® e *Rayyan*®. Os resultados extraídos dos estudos incluídos serão apresentados em forma descritiva narrativa.

Descritores: Procedimentos Cirúrgicos de Citorredução; Quimioterapia Intraperitoneal Hipertérmica; Unidades de Terapia Intensiva; Período Pós-Operatório; Cuidados de Enfermagem.

INTRODUCTION

Since the 1980s, cytoreductive surgery accompanied by hyperthermic intraperitoneal chemotherapy (HIPEC) has emerged as an excellent alternative for cancer patients with malignant peritoneal, ovarian, uteri-

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ne, gastric, and intestinal tumors[1-4]. Improvement in morbidity, reduction in recurrence and mortality, and increased life expectancy after discharge from the intensive care unit (ICU) of patients undergoing cytoreduction and HIPEC have been observed[2,5].

Cytoreductive surgery with HIPEC occurs in two phases. The first stage, called cytoreduction, involves the macroscopic removal of visible tumors in the peritoneal cavity or affected abdominal organs[4]. After the removal of tumor foci, hyperthermic chemotherapy is applied to chemically treat microscopic tumor cells that cannot be surgically removed[4]. The application of chemotherapy can be performed laparoscopically or in the "coliseum" modality. This latter modality refers to open surgery with manual application of chemotherapy by the surgeon at a dose nearly 10 times higher than intravenous, at a temperature of approximately 43 °C, for 30 minutes to 1 hour[4,6]. Patients undergoing cytoreduction and HIPEC require immediate postoperative recovery in the ICU due to the complexity of the procedure and critical clinical conditions [7].

The application of HIPEC results in various alterations of organic functions in the immediate postoperative period that require rapid intervention by ICU nurses, such as hemodynamic instability due to the loss of large volumes of fluid during surgery; ventilatory instability, especially in the case of tumors affecting the diaphragm and due to the need to maintain chest tube drainage; blood coagulation disorders due to the depletion of coagulation factors; kidney injury due to high-dose chemotherapy and hypovolemia; hypothermia due to intracavitary temperature loss to the environment during surgery; risk of paralytic ileus due to manipulation of gastrointestinal organs; risk of glycemic instability and nutritional instability due to chemotherapy of abdominal organs; and risk of surgical site infection due to the breakdown of the sterile barrier during surgery or contamination of the surgical wound in the ICU[7-10].

Due to the complexity of cytoreduction and HIPEC, specific postoperative care needs exist for adequate recovery and minimization of complications and adverse events. In the ICU, a qualified nursing team must understand the risks of these surgical procedures and the required patient care.

Attention must be paid to hemodynamic, ventilatory, glycemic, and temperature fluctuations, pain assessment, as well as wound care, drainage, assessment of secretions and volume measurement, and adequate fluid balance[7,10,11]. Nurses also need to pay more attention to the mental health of the individual and family, as ICU stay is associated with short- and long-term psychological consequences such as delirium, anxiety, depression, and post-traumatic stress disorder in patients [12].

Evidence-based practice (EBP) allows the definition of the best evidence for decision-making in clinical practice [13]. By adopting EBP in daily practice, nursing avoids the practice of empirical care based on poorly integrated cultures and promotes those based on scientifically proven care, thereby ensuring the quality of care and patient safety [13]. Therefore, the basis of what scientific studies bring about care is crucial for patient safety and their proper recovery.

A preliminary search of the International Prospective Register of Systematic Reviews (PROSPERO), MEDLINE, the Cochrane Database of Systematic Reviews (CENTRAL), and the JBI Evidence Synthesis did not identify protocols or systematic scoping reviews. Nursing-oriented articles mention cytoreduction, HIPEC, and intraoperative care, such as operating room preparation and team protection during chemotherapy infusion[14,15]. Patient experience in the postoperative period and hospital discharge has also been addressed[16]. In addition, guidelines for medical teams have been identified to describe organic changes after cytoreduction and HIPEC procedures [7-11].

Therefore, the review question was formulated using the PCC mnemonic, which stands for (P)articipants, (C)oncept, and (C)ontext: What is the postoperative nursing care indicated for adult and elderly critically ill patients hospitalized in the ICU after cytoreductive surgery with HIPEC? This study aims to map the postoperative nursing care indicated for adult and elderly critically ill patients hospitalized in the ICU after cytoreductive surgery with HIPEC.

METHOD

The JBI methodology was adopted for the protocol of the scoping review after the formulation of the research question and the definition of the objective[17] The Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) checklist will be used to verify that all mandatory items have been addressed and to ensure the quality and transparency of the writing[18]. No research ethics committee (REC) approval was required

to develop this scoping review protocol. The protocol was registered with the Open Science Framework (OSF). (https://osf.io/uzh5k/).

Inclusion criteria

Participants

Studies of adult and elderly oncology patients undergoing cytoreductive surgery with HIPEC and recovering in the ICU will be included. There will be no distinction based on biological sex, ethnicity, or country of patients.

Concept

This scoping review will map the postoperative nursing care to be applied to patients in the ICU following cytoreduction with HIPEC, aiming to identify care related to:

- Hemodynamic, ventilatory, and neurological monitoring;
- Pain assessment;
- Care for surgical wounds and invasive devices;
- Mental health care for the patient and family attention;
- Nutritional care and early mobilization.

Context

Studies whose context of postoperative patient care is the intensive care unit environment will be considered.

Types of research sources

Sources of information will include primary studies with qualitative or quantitative methodology, systematic reviews, scoping reviews, integrative reviews, or literature reviews, available electronically, without limitation of language or year of publication. Guidelines published by specialized societies, such as the Brazilian Society of Surgical Oncology (SBCO) and Enhanced Recovery After Surgery (ERAS) protocols, will also be selected. Opinion articles, editorials, letters to the editor, and articles mentioning preoperative and intraoperative surgical periods will be excluded.

Search strategy

First, a search of MEDLINE (PubMed) was performed to identify the most commonly used terms in the titles, abstracts, and keywords of studies involving patients admitted to the ICU and undergoing cytoreduction and HIPEC. It was verified which identified terms were indexed as descriptors in the Medical Subject Headings (MeSH) and the Health Sciences Descriptors (DeCS). After selecting English and Portuguese descriptors, a pilot test was conducted by developing an initial search strategy applied to MEDLINE (PubMed) and CINAHL, as shown in Figure 1.

Figure 1 – Initial search strategy on MEDLINE (PubMed) and CINAHL databases. Porto Alegre, RS, Brazil, 2023

Database	Search strategy	Results
MEDLINE (PubMed)	(Cytoreduction Surgical Procedures[mh] OR Cytoreduct*[tiab] OR Debulk*[tiab]) AND (Hyperthermic Intraperitoneal Chemotherapy[mh] OR Hyperthermia, Induced[mh:noexp] OR Hyperthermic Intraperitoneal Chemotherap*[tiab] OR HIPEC[tiab] OR Hot Chemotherap*[tiab] OR Intraperitoneal Hyperthermic Chemotherap*[tiab] OR Induced Hypertherm*[tiab] OR Therapeutic Hypertherm*[tiab] OR Thermotherap*[tiab] OR Fever Therap*[tiab] OR Local Hypertherm*[tiab]) AND (Intensive Care Units[mh:noexp] OR Respiratory Care Units[mh] OR Critical Care[mh] OR Critical Care Nursing[mh] OR Intensive care*[tiab] OR Critical care*[tiab] OR ICU[tiab] OR Care Unit*[tiab] OR Nursing Care[mh:noexp] OR Medical-Surgical Nursing[mh] OR Oncology Nursing[mh] OR Nurses[mh] OR Nursing[tiab] OR Nurse*[tiab] OR Postoperative Period[mh] OR Postoperative Care[mh] OR Recovery Room[mh] OR Enhanced Recovery After Surgery[mh] OR Postoperat*[ti] OR Post-operat*[ti] OR Post-surg*[ti] OR Recover*[ti])	315

CINAHL	(MH "Cytoreduction Surgical Procedures" OR TI (Cytoreduct* OR Debulk*) OR AB (Cytoreduct* OR Debulk*) OR SU (Cytoreduct* OR Debulk*)) AND (MH ("Hyperthermic Intraperitoneal Chemotherapy" OR "Hyperthermia, Induced") OR TI ("Hyperthermic Intraperitoneal Chemotherap*" OR "HIPEC" OR "Hot Chemotherap*" OR "Intraperitoneal Hyperthermic Chemotherap*" OR "Induced Hypertherm*" OR "Therapeutic Hypertherm*" OR "Thermotherap*" OR "Fever Therap*" OR "Local Hypertherm*") OR AB ("Hyperthermic Intraperitoneal Chemotherap*" OR "HIPEC" OR "Hot Chemotherap*" OR "Intraperitoneal Hyperthermic Chemotherap*" OR "Induced Hypertherm*" OR "Therapeutic Hypertherm*" OR "Thermotherap*" OR "Fever Therap*" OR "Local Hypertherm*") OR SU ("Hyperthermic Intraperitoneal Chemotherap*" OR "HIPEC" OR "Hot Chemotherap*" OR "Intraperitoneal Hyperthermic Chemotherap*" OR "Induced Hypertherm*" OR "Therapeutic Hypertherm*" OR "Thermotherap*" OR "Fever Therap*" OR "Local Hypertherm*")) AND (MH ("Intensive Care Units" OR "Respiratory Care Units" OR "Critical Care" OR "Critical Care Nursing" OR "Nursing Care" OR "Medical-Surgical Nursing" OR "Oncology Nursing" OR "Nurses" OR "Postoperative Period" OR "Postoperative Care" OR "Recovery Room" OR "Enhanced Recovery After Surgery") OR TI ("Intensive care*" OR "Critical care*" OR "ICU" OR "Care Unit*" OR "Nursing" OR "Nurse*" OR "Postoperat*" OR "Post-operat*" OR Post-surg* OR Recover*) OR AB ("Intensive care*" OR "Critical care*" OR "ICU" OR "Care Unit*" OR "Nursing" OR "Nurse*") OR SU ("Intensive care*" OR "Critical care*" OR "ICU" OR "Care Unit*" OR "Nursing" OR "Nurse*"))	57

After the validation of the initial search strategy, the adaptation of the descriptors for other databases to be used in the advanced search will be carried out. The search for descriptors and the development of search strategies were carried out by a librarian specializing in health research in July 2023. Articles published in languages not understood by the researchers will be included, and a translator will be contacted to read them to avoid linguistic bias. The search and selection of studies will take place from November 2023 to March 2024.

Information sources

The databases included will be MEDLINE (PubMed), BVS, Scopus, Embase, CINAHL, CENTRAL, and Web of Science. The Scopus, Embase, CENTRAL, and Web of Science databases will be accessed through the Portal de Periódicos maintained by the Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (Capes) of Brazil. In contrast, CINAHL will be accessed through EBSCO. For each scientific article included in the scoping review, the reference lists of the cited bibliographic references will be read to identify additional sources of information on the study topic.

The gray literature search will be conducted by accessing the ProQuest database to identify theses and dissertations. In addition, the following sources of gray literature will be consulted:

- *System for Information on Grey Literature in Europe* (https://opengrey.eu/);
- *British Library EThOS* (https://ethos.bl.uk/Home.do/);
- *Centre for Reviews and Dissemination* (https://www.york.ac.uk/crd/).

Selection of evidence sources

Initially, duplicates will be removed, followed by reading the articles' titles, objectives, and abstracts. Once the research topic is identified, the second phase of full reading proceeds. The search, selection processes, and reason for inclusion will be detailed for studies selected through reference lists.

If the study addresses the research topic, and study object, answers the research question, and meets the inclusion criteria, it will be included in the review. The entire process of study selection is carried out by two reviewers in a blinded manner. EndNote Web® is used to organize the identified studies best and remove duplicates. Relevant documents are fully retrieved, and their citation details are imported into Rayyan®. The reason for exclusion by one or both independent reviewers is reported in the full review. In the event of disagreement in the selection of studies, a third reviewer will be consulted in the review process.

Data extraction

Two independent reviewers will use a tool developed by the reviewers to extract data from the studies included in the scoping review, as shown in Figure 2. Depending on the content of

the articles included in the scoping review, the data extraction tool may be modified and revised as necessary during the data collection process. However, any changes made will be fully described in the scoping review. In case of disagreement between the two reviewers regarding the information collected, a third reviewer will be consulted.

Figure 2 – Data extraction tool. Porto Alegre, RS, Brazil, 2023

Details and characteristics of included studies
Author
Year
Magazine and country
Research objective
Applied methodology
What are the care considerations for patients in the ICU undergoing cytoreduction associated with HIPEC?
Hemodynamic monitoring care
Care with mechanical ventilation and oxygen therapy
Patient pain assessment and assistance
Sedation care, assessment of neurological and sensory patterns
Surgical wound care
Care of drains, probes, stoma, tubes and catheters
Care to prevent healthcare-related infections for patients
Glycemic control
Temperature control
Nutrition care
Early mobilization
Mental health care and family care

Analysis and presentation of data

The results selection process will be presented in a figure format using the PRISMA flowchart to illustrate the entire research movement, including and excluding articles, until the final definition of those included in the review [19]. Methodological quality assessment and evidence analysis of studies will be omitted, as allowed by the JBI methodology[17]. The analysis and presentation of results will be descriptive and narrative. The goal is to produce a table with key findings and a chart with crucial care points for patients undergoing cytoreduction and HIPEC. In addition, if the total number of studies included in the scoping review exceeds a specific number, these may be presented as supplementary files or appendices.

Through the scoping review, the care of patients undergoing cytoreduction and HIPEC is expected to be identified. By mapping this care, a specific care protocol for application to this patient profile, the product of a professional master's degree in nursing from a public university, will subsequently be developed.

REFERENCES

1. Tsuyoshi H, Inoue D, Kurokawa T, Yoshida Y. Hyperthermic intraperitoneal chemotherapy (HIPEC) for gynecological cancer. J Obstet Gynaecol Res. 2020;46(9):1661-71. https://doi.org/10.1111/jog.14391
2. Kusamura S, Barretta F, Yonemura Y, Sugarbaker PH, Moran BJ, Levine EA, et al. The Role of Hyperthermic Intraperitoneal Chemotherapy in Pseudomyxoma Peritonei After Cytoreductive Surgery. JAMA Surg. 2021;156(3):e206363. https://doi.org/10.1001/jamasurg.2020.6363
3. Spiliotis J, Kalles V, Kyriazanos I, Terra A, Prodromidou A, Raptis A, et al. CRS and HIPEC in patients with peritoneal metastasis secondary to colorectal cancer: the small--bowel PCI score as a predictor of survival. Pleura Peritoneum. 2019;4(4):20190018. https://doi.org/10.1515%2Fpp-2019-0018
4. Rodríguez-Ortiz L, Arjona-Sánchez A, Ibañez-Rubio M, Sánchez-Hidalgo J, Casado-Adam A, Rufián-Peña S, et al. Laparoscopic cytoreductive surgery and HIPEC: a comparative matched analysis. Surg Endosc. 2021;35(4):1778-85. https://doi.org/10.1007/s00464-020-07572-x
5. Wang Y, Ren F, Chen P, Liu S, Song Z, Ma X. Effects of CytoReductive surgery plus hyperthermic IntraPEritoneal chemotherapy (HIPEC) versus CytoReductive surgery for ovarian cancer patients: A systematic review and meta-analysis. Eur J Surg Oncol. 2019; 45(3):301-309. https://doi.org/10.1016/j.ejso.2018.10.528
6. Narasimhan V, Wilson K, Britto M, Warrier S, Lynch AC, Michael M, et al. Outcomes following cytoreduction and HIPEC for Pseudomyxoma Peritonei: 10-year experience. J Gastrointest Surg. 2020;24(4):899-906. https://doi.org/10.1007/s11605-019-04239-4
7. Chawla A, Zhu C-C, Backer G, O'Gara J, Fong ZV, Deng H, et al. Perioperative management of patients undergoing CRS and HIPEC. Clin Surg [Internet]. 2020 [citado 2023 Ago 20];5:2788. Disponível em: https://www.clinicsinsurgery.com/open-access/perioperative-management-of-patients-undergoing-crs-and-hipec-7630.pdf
8. Charo LM, Jou J, Binder P, Hohmann SF, Saenz C, McHale M, et al. Current status of hyperthermic intraperitoneal chemotherapy (HIPEC) for ovarian cancer in the United States. Gynecol Oncol. 2020;159(3):681-6. https://doi.org/10.1016/j.ygyno.2020.09.022
9. Cianci S, Riemma G, Ronsini C, De Franciscis P, Torella M, Schiattarella A, et al. Hyperthermic intraperitoneal chemotherapy (HIPEC) for ovarian cancer recurrence: systematic review and meta-analysis. Gland Surg [Internet]. 2020 [citado 2023 Ago 20];9(4):1140–8. Disponível em: https://pubmed.ncbi.nlm.nih.gov/32953629/
10. Mishra M, Singh N, Ghatage P. Past, present, and future of hyperthermic intraperitoneal chemotherapy (HIPEC) in ovarian cancer. Cureus. 2021;13(6):e15563. https://doi.org/10.7759/cureus.15563
11. Solanki SL, Mukherjee S, Agarwal V, Thota RS, Balakrishnan K, Shah SB, et al. Society of Onco-Anaesthesia and Perioperative Care consensus guidelines for perioperative management of patients for cytoreductive surgery and hyperthermic intraperitoneal chemotherapy (CRS-HIPEC). Indian J Anaesth. 2019;63(12):972-87. https://doi.org/10.4103/ija.ija_765_19
12. Rose L, Muttalib F, Adhikari NKJ. Psychological Consequences of Admission to the ICU: Helping Patients and Families. JAMA. 2019;322(3):213–215. https://doi.org/10.1001/jama.2019.9059
13. Vieira TW, Sakamoto VTM, Moraes LC, Blatt CR, Caregnato, RCA. Validation methods of nursing care protocols: an integrative review. Rev Bras Enferm. 2020;73(Suppl 5):e20200050 https://doi.org/10.1590/0034-7167-2020-0050
14. Dunn D, Ciccarelli E, Moltzen N. Cytoreductive Surgery With Hyperthermic Intraperitoneal Chemotherapy, Part II: Implementation. AORN J. 2019;110(6):606-625. https://doi.org/10.1002/aorn.12865
15. Li D, Huang S, Zhang F, Ball RD, Huang H. Perianesthesia Care of the Oncologic Patient Undergoing Cytoreductive Surgery with Hyperthermic Intraperitoneal Chemotherapy: A Retrospective Study. J Perianesth Nurs. 2021;36(5):543-552. https://doi.org/10.1016/j.jopan.2020.10.016
16. Seibæk L, Thaysen HV, Lomborg KE. Non-curative surgical oncology: postoperative needs

and preferences. BMJ Support Palliat Care. 2021;3:bmjspcare-2020-002789. https://doi.org/10.1136/bmjspcare-2020-002789

17. Peters MDJ, Godfrey C, McInerney P, Munn Z, Tricco AC, Khalil H. Chapter 11: Scoping reviews (2020 version). In: Aromataris E, Munn Z, Editors. JBI manual for evidence synthesis. Adelaide: JBI, 2020. [citado 2023 Ago 20]. Disponível em: https://jbi-global-wiki.refined.site/space/MANUAL

18. Tricco AC, Lillie E, Zarin W, O'Brien K, Colquhoun H, Levac D, et al. PRISMA extension for scoping reviews (PRISMA-ScR): checklist and explanation. Ann Intern Med. 2018;169(7):467-73. https://doi.org/10.7326/m18-0850

19. Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. BMJ. 2021;372(71). https://doi.org/10.1136/bmj.n71

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