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Management of anesthesia in elderly patients, special considerations and challenges

Manejo da anestesia em pacientes idosos, considerações especiais e desafios

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ABSTRACT

Introduction: The management of anesthesia in elderly patients presents distinct challenges due to physiological changes related to aging. Comorbidities, physical frailty, and increased risk of postoperative complications are important aspects to consider. Methods: Systematic reviews of the literature and analyses of clinical and experimental studies addressing the management of anesthesia in elderly patients were conducted. Articles published in English, Spanish and Portuguese were selected. The keywords used were "anesthesia in the elderly", "preoperative evaluation", "anesthetic techniques", "intraoperative monitoring", "postoperative pain control" and "prevention of complications". Results: Comprehensive, individualized preoperative

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evaluation was identified as crucial to identify and treat comorbidities and physical frailty in elderly patients. The choice of the appropriate anesthetic technique depends on the type of surgery and the patient's clinical conditions. Careful monitoring during anaesthesia, including blood pressure, heart rate, oxygenation and capnography, is critical to detect and intervene early on haemodynamic and respiratory changes. The control of postoperative pain in the elderly requires an individualized approach, with the appropriate use of analgesics and regional blocks. Complication prevention strategies, such as optimization of hydration, glycemic control, early mobilization, and appropriate use of medications, are essential to reduce the risk of delirium, infection, and cognitive dysfunction. Conclusion: The management of anesthesia in elderly patients requires an individualized and comprehensive approach, taking into account the physiological changes related to aging and associated comorbidities. Careful preoperative evaluation, appropriate choice of anesthetic technique, close intraoperative monitoring, postoperative pain control, and prevention of complications are critical to ensure safe perioperative care and successful recovery in the elderly. Keywords: anesthesia in the elderly, preoperative evaluation, anesthetic techniques, intraoperative monitoring, postoperative pain control, complication prevention.

Keywords: Anesthesia in the elderly, Preoperative evaluation, Anesthetic techniques, Intraoperative monitoring, Postoperative pain control, Prevention of complications.

INTRODUCTION

The aging of the population is a global reality, and with it comes the need for an increasingly specialized and adapted approach to medical care, including the management of anesthesia in elderly patients. As life expectancy increases, so does the number of surgical and medical procedures performed in this age group, bringing with it unique challenges and special considerations for healthcare professionals (SEGURADO, et al. 2007; FERNANDES, et al. 2002).

Anesthesia in elderly patients presents a series of complexities, ranging from the physiological changes resulting from aging to the comorbidities often associated with this population. These factors can significantly influence patient response to anesthesia, perioperative management, and postoperative outcomes (AQUINO, et al. 2004).

In this era of modern medicine, it is imperative to understand the nuances of anesthetic management in elderly patients in order to ensure the safety, comfort, and success of procedures. From preoperative evaluation to the appropriate selection of anesthetic agents and monitoring techniques, a number of special considerations must be taken into account to optimize perioperative outcomes in this vulnerable population (ALMEIDA, et al. 2004; BARBOSA, et al. 2007).

In addition, we will discuss common comorbidities in elderly patients, such as heart, lung, and kidney disease, and their impact on anesthetic planning and perioperative management.

Issues related to preoperative evaluation, selection of anesthetic techniques, and intraoperative monitoring will also be addressed, highlighting the importance of a multidisciplinary and individualized approach for each elderly patient (BARBOSA, et al. 2008; MACHADO, et al. 2003; MANDIM, et al. 2004.).

By understanding the unique challenges faced when administering anesthesia to elderly patients, we can develop tailored strategies and tailored approaches that ensure safe and effective anesthesia practice. This article aims to provide a comprehensive and up-to-date view on this crucial topic, contributing to the continuous improvement of health care provided to this growing portion of the population.

METHODOLOGY

This is a narrative review of the literature, which was done by determining the following descriptors by the MESH (Medical Subject Headings) platform and the following descriptors can be obtained, which were joined by the Boolean operator AND: "Anesthesiology", "elderly patients", "old patients" and "patient management".

The search was carried out on the PUBMED targeting platform, which indexes the MEDLINE database (Online System for Search and Analysis of Medical Literature). First, 108 studies were found. After this first stage, 20 duplicate articles, 5 editorials and 9 incomplete articles were excluded, leaving 74 articles to be analyzed.

At this stage, the titles and abstracts of these 50 articles were read, as they did not fit the theme of the article. Subsequently, the 24 selected articles were thoroughly read, and 7 were selected to compose this review.

RESULTS AND DISCUSSION

We selected 7 articles published between 2012 and 2022 that met the criteria listed above

It identified the presence of coexisting diseases, as well as their severity, according to the ASA classification, as risk factors for the development of postoperative complications of PC in elderly patients. However, CL proved to be a safe technique when used in these patients with low morbidity and mortality rates.

TITLE	AUTHOR, YEAR	OBJECTIVES	RESULTS	CONCLUSIONS
Reduced fasting time improves comfort and satisfaction for patients undergoing anesthesia for hip fracture	IMBELLONI, et al. 2015.	Patient satisfaction is a standard indicator of quality of care. The aim of this study was to evaluate whether preoperative oral intake of 200mL of a carbohydrate drink can improve comfort and satisfaction with anesthesia in elderly patients with hip fracture.	One hundred patients were enrolled in one of two preoperative fasting regimens. Fasting time decreased significantly in the study group. Patients drank 200mL 2h59 before surgery and were not hungry or thirsty upon arrival at the operating room, resulting in greater satisfaction with perioperative anesthetic care ($p<0.00$).	The surgical patient satisfaction questionnaire can become a useful tool in evaluating the quality of care. In conclusion, CHO significantly reduces preoperative discomfort and increases satisfaction with anesthesia care.
Comparison between spinal, combined spinal-epidural and continuous hip spinal anesthesia in elderly patients: a retrospective study	IMBELLONI, et al. 2022.	To compare continuous spinal anesthesia, combined spinal epidural anesthesia, and single-injection spinal anesthesia for hip surgery in elderly patients over a 4-year period to determine possible advantages and disadvantages of the three techniques.	There were no significant differences between the groups in relation to sex, age, weight and height. In other words, they showed statistically significant differences between the groups studied.	It demonstrated that regional anesthesia techniques are related to a low mortality rate in the first postoperative month and a low incidence of complications.
Spinal anesthesia with a low dose of the combination of bupivacaine and fantanil: a good alternative for transurethral prostate resection surgery in elderly patients on an outpatient basis	AKCABOY, et al. 2012.	To evaluate the efficacy, duration of blockade, length of stay in the post-anesthesia recovery room and adverse effects of the intrathecal use of low doses of bupivacaine in combination with fentanyl and compare them with the conventional dose of prilocaine and fentanyl in surgery of transurethral prostate resection in elderly patients on an outpatient basis.	There were no significant differences between the groups in relation to sex, age, weight and height. Patients in group 2 were smaller compared to groups 1 and 3. There were no significant differences in arterial hypotension, bradycardia, paresthesia and blood transfusion. Postoperative mental confusion was observed in 19 patients, with no difference between techniques.	Intrathecal administration of 4 mg of bupivacaine + 25 µg of fentanyl provided adequate spinal anesthesia with shorter duration of block and stay in the post-anesthesia care unit with a stable hemodynamic profile compared to intrathecal administration of 50 mg of prilocaine + 25 µg of fentanyl for transurethral prostate resection surgery in elderly patients on an outpatient basis.

Postoperative cognitive complications related to general anesthesia in elderly patients	SANTOS, et al. 2021.	To analyze and review the main cognitive complications related to the postoperative period of elderly patients undergoing general anesthesia.	The duration of the block and the length of stay in the post-anesthesia care unit were shorter in Group B than in Group P. Hypotension and bradycardia were not observed in Group B, which was significantly different from Group P.	The management of elderly patients undergoing anesthetic induction must be individualized and carefully monitored, as the prevalence of conditions and functional changes related to aging are substantial.
Monitoring the effects of spinal anesthesia on cerebral oxygen saturation in elderly patients using near-infrared spectroscopy	KUSKU, et al. 2014.	Detect potentially adverse effects of hemodynamic and respiratory changes in systemic oxygen supply using cerebral oximetry methods in patients undergoing spinal anesthesia.	Patients over 60 years of age have a higher rate of comorbidities and a greater chance of previously diminished cognitive reserve; cognitive complications such as postoperative delirium and postoperative cognitive dysfunction have a significant incidence in this group.	Evaluation of the data obtained in the study demonstrated that the post-spinal decline in blood pressure and heart rate decreases systemic oxygen delivery and negatively affects cerebral oxygen levels. However, this downward shift did not result in deterioration of cognitive functioning.
	SILVA, et al. 2020.	To evaluate the correlation between different age strata and functional status with the surgical outcome of elderly patients.	No significant changes were observed in pre- and postoperative measurements of hemoglobin levels and SMMT scores and intraoperative SpO2 levels.	It was found that very elderly patients represented a significant proportion of patients admitted to the CICU. They had higher severity scores, a higher prevalence of organ failure and were more likely to undergo non-elective surgeries.
The very elderly surgical population in a serious scenario: clinical characteristics and results	MESQUITA, et al. 2018.	To identify risk factors for the occurrence of postoperative complications in laparoscopic cholecystectomies (LC) in elderly patients.	However, significant variations were observed in intraoperative MAP, MHR and rSO2 levels. Furthermore, a correlation between variations in rSO2, MAP and FCM was determined.	It identified the presence of coexisting diseases, as well as their severity, according to the ASA classification, as risk factors for the development of postoperative PC complications in elderly patients. However, LC proved to be a safe technique when used in these patients with low morbidity and mortality rates.

THE AUTHOR

In summary, all the articles show that the management of anesthesia in elderly patients requires a careful and adapted approach, considering the physiological particularities, comorbidities, and treatment goals of everyone. By understanding and addressing these special considerations, healthcare providers can ensure a safe and effective anesthetic practice in this vulnerable population.

The management of anaesthesia in elderly patients requires special considerations and faces distinct challenges. As mentioned by Almeida et al. (2004), the elderly have physiological changes associated with aging, such as decreased kidney and liver function, reduced lung capacity, and changes in the distribution of body fat. These changes may affect the pharmacokinetics and response of the elderly to anesthetic drugs.

One of the main challenges experienced by anesthesiologists when managing anesthesia in elderly patients is to assess the functional capacity of the elderly patient before surgery, as highlighted by Aquino et al. (2004). It is important to consider the presence of comorbidities, physical frailty, decreased physiological reserve, and increased risk of postoperative complications. Aging is associated with pharmacokinetic and pharmacodynamic changes, which may influence the patient's response to anesthetic agents. According to Fernandes and Neto (2002), decreased renal and hepatic function can affect the elimination and metabolism of drugs, leading to greater sensitivity to the effects of anesthetics. Therefore, it is necessary to adjust doses and appropriately monitor the depth of anaesthesia. A comprehensive evaluation should be performed to identify and treat underlying medical conditions, such as heart, lung, and kidney disease.

It is also important to highlight that the choice of the appropriate anesthetic technique is essential. As mentioned by Barbosa et al. (2008), general anesthesia and regional anesthesia are common options, each with its advantages and disadvantages. General anesthesia may be preferred in cases of extensive or complex surgeries, while regional anesthesia such as spinal anesthesia or epidural anesthesia may be beneficial in lower limb or abdominal surgeries. In addition, in the management of anesthesia in elderly patients, the choice of anesthetic technique also plays a crucial role. Imbelloni and Beato (2022) state that spinal anesthesia and regional anesthesia may be preferable in many cases, as they have less impact on the cardiovascular and respiratory system, in addition to providing faster recovery and a reduction in the risk of pulmonary complications.

During anaesthesia, careful monitoring is essential to ensure haemodynamic stability, adequate oxygenation and maintenance of homeostasis. According to Fernandes and Neto (2002), the monitoring of blood pressure, heart rate, oxygenation and capnography help to detect any alteration early and intervene promptly. That said, aging is associated with pharmacokinetic and pharmacodynamic changes, which may influence the patient's response to anesthetic agents. According to a recent study by Fernandes and Neto (2017), decreased renal and hepatic function can affect the elimination and metabolism of drugs, leading to greater sensitivity to the effects of

anesthetics. Therefore, it is necessary to adjust doses and appropriately monitor the depth of anaesthesia.

Another important aspect is postoperative pain management. Older adults may be more sensitive to pain and require an individualized approach to pain management, as highlighted by Santos et al. (2021). Proper use of pain relievers, such as opioids and regional blocks, can help minimize discomfort and speed recovery.

The prevention of postoperative complications, such as delirium, infection, and cognitive dysfunction, is also essential. By pointing out these complications, Mandim et al. (2004) present solutions so that such adversities do not compromise the well-being of the elderly. Highlighting strategies such as hydration optimization, glycemic control, early mobilization, and appropriate use of medications can contribute to reducing these complications.

In the management of anaesthesia in elderly patients, the choice of anaesthetic technique also plays a crucial role. Imbelloni and Beato (2021) state that spinal anesthesia and regional anesthesia may be preferable in many cases, as they have less impact on the cardiovascular and respiratory system, in addition to providing faster recovery and a reduction in the risk of pulmonary complications.

In summary, the management of anesthesia in elderly patients requires an individualized approach, considering age-related physiological changes and associated comorbidities. Imbelloni and Beato (2022) mention that careful evaluation and monitoring, appropriate choice of anesthetic technique, and adequate pain control are essential.

FINAL THOUGHTS

The management of anesthesia in elderly patients is a complex challenge due to the physiological changes and comorbidities often present in this population. Based on the discussion constructed, it is observed that it is essential that anesthesiologists are prepared to deal with the peculiarities of elderly patients in order to ensure safe and effective anesthesia.

The main challenges faced include the presence of comorbidities and physiological changes related to aging, such as cardiovascular, pulmonary, renal, metabolic, and neurological diseases. It is critical for anesthesiologists to be aware of these pre-existing conditions and to carefully weigh the risk-benefit of each anesthetic procedure. Pharmacokinetic and pharmacodynamic changes associated with aging may also affect the response of elderly patients to anesthetic agents, requiring dose adjustments and appropriate monitoring of the depth of anesthesia.

Frailty and reduced functional reserve in elderly patients increase the risk of perioperative complications such as infections, delirium, and cognitive dysfunction. Therefore, a preoperative multidisciplinary evaluation is crucial to optimize the patient's health conditions. The choice of anesthetic technique plays a crucial role in the management of anesthesia in elderly patients. Techniques such as spinal anesthesia and regional anesthesia may be preferable, due to the lower impact on the cardiovascular and respiratory systems, in addition to providing faster recovery and reducing the risk of pulmonary complications.

Finally, it should be noted that the management of anesthesia in elderly patients requires an individualized approach, considering pre-existing health conditions, age-related physiological changes, and the appropriate choice of anesthetic technique. A multidisciplinary approach, involving anesthesiologists, surgeons, and geriatricians, is essential to provide safe and effective anesthesia while minimizing risks and maximizing positive outcomes for elderly patients.

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