

A Study on Challenges of Geriatric Anesthesia

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Abstract

Introduction: Aging is a universal and progressive physiological phenomenon clinically characterized by degenerative changes in both the structure and the functional capacity of organs and tissues. In general, geriatric patients are more sensitive to medications of anesthesia. Less medication is usually required to achieve the desired clinical effect, and the drug effect is often prolonged. The most important outcome and overall objective of the perioperative care of the geriatric population are to speed recovery and avoid functional decline. This study aimed to analyze the challenges of geriatric anesthesia.

Methods: This prospective observational study was conducted at the Department of Anesthesia, Upazilla Health Complex, Sonagazi, Feni, Bangladesh. The study was carried out from October 2021 to September 2022. A total of 50 patients were selected as study subjects as per the inclusion criteria.

Result: Among the study subjects, 10 (20%) patients were of the 60-65 years age group, 30 (60%) patients were of the 66-70 years age group, and 20 (40%) patients were of more than 70 years age group. Considering the cardiovascular comorbidities, most (20, 40%) of the patients had hypertension, followed by 10 (20%) patients had congestive heart failure, 8 (16%) patients had atherosclerosis, 5 (10%) patients had coronary artery disease, another 5 (10%) had cardiac arrhythmias and 2 (4%) patients had aortic stenosis. Regarding pulmonary comorbidities, 15 (30%) patients had emphysema followed by 14 (28%) patients had chronic bronchitis, 11 (22%) had pneumonia and 10 (20%) patients who had lung cancer. In terms of neurological comorbidities, most of the patients (11, 22%) suffered from epilepsy & seizure, followed by 10 (20%) suffered from Alzheimer's disease, 10 (20%) had multiple sclerosis, 10 (20%) had Parkinson's disease and 9 (18%) patients had a stroke. Several perioperative precautions were taken before the application of medications of anesthesia, such as evaluation of anemia & polycythemia, blood sugar level, and cardiopulmonary exercise testing.

Conclusion: The complexities delineated demonstrate that there was not one best way for every patient; rather, an individualized approach is required. Care of the elderly patient requires thorough preoperative assessment and planning and the involvement of a multidisciplinary clinical team knowledgeable about and interested in the management of the elderly surgical patient.

Keywords: Anesthesia, Geriatric, Perioperative, Degenerative

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I. Introduction

Aging is a universal and progressive physiological phenomenon clinically characterized by degenerative changes in both the structure and the functional capacity of organs and tissues. In general, geriatric patients are more sensitive to anesthetic agents. Less medication is usually required to achieve the desired clinical effect, and the drug effect is often prolonged. The most important outcome and overall objective of the perioperative care of the geriatric population are to speed recovery and avoid functional decline. [1] Life expectancy in developed countries has increased significantly over the past 100 years. It has been suggested that by the year 2050, approximately 20% of the population may be over the age of 65. Many of these older adults will undergo surgery and anesthesia. Preadmission testing nurses need to be able to deal with the various challenges that accompany this group of patients. [2] Older adults are at increased risk of complications and mortality after surgery. Beyond organ-based complications such as postoperative myocardial infarction, older

adults may be more likely than other patients to experience specific syndromes, such as postoperative delirium, long-term cognitive changes, new dependence on activities of daily living, and so on. [3]By age 80, the older adult has experienced many physiological and anatomical changes, many starting during the 4th decade of life. Changes in tissue mass and function in major organ systems demand special perianesthetic care planning to enhance patient outcomes. The geriatric patient will continue to pose challenges during the perianesthesia period. [4]Universally recognized goals of preoperative anesthesia assessment are the evaluation of the patient's health status to define the entity of the surgical risk, and the anticipation of possible complications while optimizing and planning preventive strategies. [5] Cardiovascular diseases, respiratory disorders, endocrinopathies, diminishing hepatic functions, variably impaired renal functions, nutritional deficiencies, gastrointestinal tract dysfunctions, cognitive and neuro-behavioral changes, a common practice of polypharmacy and many other comorbid diseases largely determine the course and impact of surgical interventions in elderly patients. [6]To cope with the challenges, many countries strengthen anesthesia safety by popularizing advanced technology, such as ultrasound and visualization techniques, new airway devices, anesthesia depth, and brain oxygen monitoring facilities. [7] Furthermore, balancing the necessity for perfusion of vital organs against the workload imposed on the heart involves a thorough understanding of the patient's medical condition, so that an anesthetic treatment plan may be tailored to the needs of the patient. [8]Moreover, frailty is a multidimensional process that can lead to the physiologic effects of aging and estimates the risk of perioperative morbidity and mortality better than chronologic age alone. [9]Depending on many variables, including genetics, lifestyle, and preventative healthcare, the extent of each system's loss of function is highly variable. Proper assessment of each system of the body should be obtained through history, physical, and focused diagnostic workup. Understanding patient physiology is vital to forming a safe and effective anesthetic plan. [10] This study aimed to analyze the challenges of geriatric anesthesia.

II. Objective

General Objective

- To evaluate the challenges of geriatric anesthesia.

Specific Objectives

- To see intraoperative and postoperative complications of anesthesia in aged patients.
- To identify risk factors for perioperative morbidity and mortality in elderly patients and explain the importance of a geriatric-focused preoperative assessment.
- To see various comorbid conditions of elderly patients who underwent surgery.

III. Methods

This prospective observational study was conducted at the Department of Anesthesia, Upazilla Health Complex, Sonagazi, Feni, Bangladesh. The study was carried out from October 2021 to September 2022. A total of 50 patients were selected as study subjects as per inclusion criteria. Evaluation of all patients was done by medical history and physical examination. All necessary investigations were done before applying anesthetic and analgesic medication and surgical procedures. Informed written consent was obtained from all study subjects. Perioperative outcomes were noted routinely. All data were kept confidential and used only for this study purpose. Ethical clearance was obtained from the ethical committee. Statistical analysis of the results was obtained by using Statistical Packages for Social Sciences (SPSS-25) software.

Inclusion Criteria

- Patients older than 60 years underwent surgical procedures.
- Patients who had given consent to participate in the study.

Exclusion Criteria

- Mentally ill patients.
- Patients who did not give consent to participate in the study.

IV. Results

Among the study subjects, 10 (20%) patients were of the 60-65 years age group, 30 (60%) patients were of the 66-70 years age group, and 20 (40%) patients were of more than 70 years age group. [Table 1] Considering the cardiovascular comorbidities, most (20, 40%) of the patients had hypertension, followed by 10 (20%) patients had congestive heart failure, 8 (16%) patients had atherosclerosis, 5 (10%) patients had coronary artery disease, another 5 (10%) had cardiac arrhythmias and 2 (4%) patients had aortic stenosis. [Table 2] Regarding pulmonary comorbidities, 15 (30%) patients had emphysema followed by 14 (28%) patients had chronic bronchitis, 11 (22%) had pneumonia, and 10 (20%) patients had lung cancer. [Table 3] In terms of neurological comorbidities, most of the patients (11, 22%) suffered from epilepsy & seizure, followed by 10 (20%) suffered from Alzheimer's disease, 10 (20%) had multiple sclerosis, 10 (20%) had Parkinson's disease and 9 (18%) patients had a stroke. [Table 4] Several perioperative precautions were taken before the application of medications or anesthesia, such as evaluation of anemia & polycythemia, blood sugar level, and cardiopulmonary exercise testing. [Figure 1]

Table 1: Distribution of respondents according to age (N=50)

Age (years)	N	%
60-65	10	20.0
66-70	30	60.0
>70	20	40.0

Table 2: Distribution of respondents according to cardiovascular comorbidities (N=50)

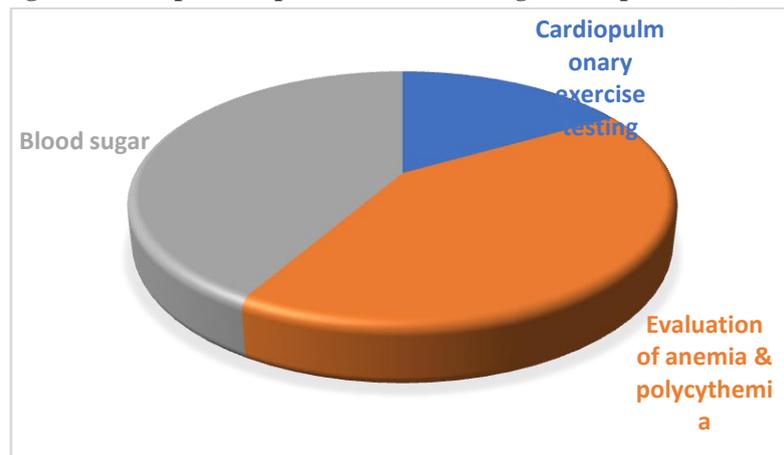
Comorbid conditions	N	%
Atherosclerosis	8	16.0
Coronary artery disease	5	10.0
Hypertension	20	40.0
Congestive heart failure	10	20.0
Cardiac arrhythmias	5	10.0
Aortic stenosis	2	4.0

Table 3: Distribution of respondents according to pulmonary comorbidities (N=50)

Comorbid conditions	N	%
Emphysema	15	30.0
Chronic bronchitis	14	28.0
Pneumonia	11	22.0
Lung cancer	10	20.0

Table 4: Distribution of respondents according to neurological comorbidities (N=50)

Comorbid conditions	N	%
Alzheimer's disease	10	20.0
Stroke	9	18.0
Multiple sclerosis	10	20.0
Epilepsy and seizure	11	22.0
Parkinson's disease	10	20.0

Figure 1: Perioperative precautions taken in geriatric patients. (N=50)

V. Discussion

Among the study subjects, 10 (20%) patients were of the 60-65 years age group, 30 (60%) patients were of the 66-70 years age group, and 20 (40%) patients were of more than 70 years age group. According to a study, The elderly (≥ 65 years) population is the fastest-growing part of the population in many parts of the developed world. [11] According to another study, 96.4% of respondents reported that they had cared for a patient aged 65 or older within the last year. [12] Considering the cardiovascular comorbidities, most (20, 40%) of the patients had hypertension, followed by 10 (20%) patients had congestive heart failure, 8 (16%) patients had atherosclerosis, 5 (10%) patients had coronary artery disease, another 5 (10%) had cardiac arrhythmias and 2 (4%) patients had aortic stenosis in this study. Achieving adequate BP control preceding an elective surgical procedure is desirable to ensure hemodynamic stability throughout the perioperative period, since labile heart rate, blood pressure, and volume status are associated with adverse cardiovascular events. Risk reduction strategies for the elderly outpatient involve the optimization of coexisting diseases. To minimize perioperative adverse events in the elderly. [13] Again surgical studies of mild anemia have not shown it to be a risk factor for death unless cardiac disease is present or major blood loss occurs. [14] Regarding pulmonary comorbidities, 15 (30%) patients had emphysema followed by 14 (28%) patients had chronic bronchitis, 11 (22%) had pneumonia, and 10 (20%) patients had lung cancer in the present study. The use of regional anesthesia alone or in combination with general anesthesia can help to avoid airway irritation and leads to reduced postoperative complications. Prophylactic anti-obstructive treatment, volatile anesthetics, propofol, opioids, and an adequate choice of muscle relaxants minimize the risk when general anesthesia is necessary. [15] In terms of neurological comorbidities, most of the patients (11, 22%) suffered from epilepsy & seizure, followed by 10 (20%) suffered from Alzheimer's disease, 10 (20%) had multiple sclerosis, 10 (20%) had Parkinson's disease and 9 (18%) patients had a stroke. A study stated that depression of CNS function is intended as a part of anesthesia and this condition is perfectly reversible and transient but as it will be described, several complications may occur, some of these causing serious disability. The methods for detecting CNS dysfunction dictate the ability to recognize some of these conditions. The most common CNS dysfunction after anesthesia is cognitive dysfunction. [16] Several perioperative precautions were taken before the application of medications of anesthesia, such as evaluation of anemia & polycythemia, blood sugar level, and cardiopulmonary exercise testing which were quite similar steps taken as stated in another study. [17] Optimal perioperative care often requires a multidisciplinary approach involving the anesthesiologist, surgeon, primary care physician, and, in selected cases, a geriatrician, subspecialty consultants, nurses, a pharmacist, and various therapists. [18] Importance should be given to age-related pharmacokinetic and pharmacodynamic considerations, effective pain control, as well as prevention and treatment of hypothermia, fluid and electrolyte imbalance, and postoperative delirium. [19]

Limitations of The Study

The study was conducted in a single hospital with a small sample size. So, the results may not represent the whole community.

VI. Conclusion

The complexities delineated demonstrate that there was not one best way for every patient; rather, an individualized approach is required. Care of the elderly patient requires thorough preoperative assessment and planning and the involvement of a multidisciplinary clinical team knowledgeable about and interested in the management of the elderly surgical patient. The main aims of effective perioperative care in elderly patients are to improve the likelihood of them returning to their pre-morbid conditions and maintaining their presence in the community.

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Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

VII. Recommendation

Evaluation of the physiologic status of the geriatric patient should take into account the variability of the changes associated with advancing age. Moreover, further studies should be conducted with a large number of subjects to identify the risks and benefits of each mode of anesthesia for elderly patients. Anesthesiologists must participate in discussions on the utility of surgery and resuscitation and are strongly encouraged to participate in national surveys and outcomes research

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