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Clinical correlates and outcomes of anaesthesia for the elderly surgical patient in a tertiary hospital

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Abstract

Background: The anaesthestic management of the elderly surgical patients deserves attention because of the increased risk of intercurrent medical diseases. This retrospective study evaluated the reasons for surgical care and the pattern of anaesthesia provided.

Methodology: This retrospective study of all elderly patients billed for surgery irrespective of the surgical specialties over a 13year period (1997-2010). Indication for surgery, anaesthetic technique, level of anaesthetist / surgeon and procedures performed were studied.

Results: A total 1168 elderly patients were operated during the study period, of which 678(58%) were male while 490 (42%) were female. Ophthalmology and Urology recorded the highest surgeries respectively. The commonest procedures included cataract extraction 399 (9.25%) with a male preponderance and prostatectomy 166 (6.17%). The anaesthetic techniques commonly used include Local Anaesthesia 733 (62.8%) and General Anaesthesia 302 (25.8%). The cadre of the attending anaesthetists included consultant Anaesthetists 130(11.1%) while Senior Registrars provided care for 280(29.1%). The level of attending surgeons includes consultants 757 (64.8%) while Senior Registrars account for 399 (34.2%).

Conclusion: Age alone is no longer a barrier to surgery and anaesthesia. Ageing changes the body's capacity to cope with the stress of illness and surgery. To reduce morbidity and mortality less invasive technique like Local Anaesthesia (LA) should be used while consultant surgeons and anaesthetists should provide the perioperative care.

Keywords: Anaesthesia, elderly, surgical outcomes

Introduction

The elderly population is fast growing globally.[1] The anaesthetic management of the elderly surgical patients deserves attention because of the impact of physiological changes on the course of anaesthesia. These changes often result in a decline in organ reserve and function. In United States, the life expectancy for patients aged above 65years is reported to be 18.9years, 11years and 7years at 75, 85 and 90years respectively.[2,3] As life expectancy increases, more elderly patients will undergo one surgery in their life time.[4] The incidence of perioperative complication is much higher in these patients due to reduced functional reserve and a high incidence of co-morbidity. Age alters both pharmacokinetic and pharmacodynamics aspects of anaesthetic management. The functional capacity of organ decline and co-existing diseases further contribute to this decline. The deteriorating organ reserve function of an individual by 1% as

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chronological age exceeds 40years thus precipitates the likelihood of co-morbidity. This decline in organ reserve function, with associated co-morbidity and the cardiorespiratory depressant effect of anaesthetic agents poses an enormous challenging task of anaesthetic management of an elderly surgical patient. Owing to aging process, and the development of safer surgical and anaesthetic technique, elderly and more debilitated patients are now undergoing ambulatory surgery.[5,6] The anaesthetist as the perioperative physician must understand the physiological changes and coexistence of other co-morbidities in managing the elderly surgical patients. Improvement in medical and anaesthetic care has created wider range of surgical interventions for patients and elderly alike, which has reduced surgical morbidity and mortality in the general population. It is crucial therefore, that the choice of anaesthetic technique for elderly surgical patients should be evaluated and determined. This may assist in the development of an anaesthetic plan for the geriatric patients. Thus, this study evaluated the anaesthetic care provided with the specific goals of identifying the population of patients over 65years and the commonest surgical services provided.

Methods

This is a retrospective study of anaesthesia for the elderly patients for various surgeries. The records of the operating room theatre of the University of Benin Teaching Hospital, Nigeria; an 850-bed tertiary referral hospital were reviewed for a 13-year period (June 1997 – May 2010). The hospital has 5 operating theatres for elective surgical operations, 4 operating theatres for obstetrics and gynaecological surgeries, 2 ophthalmology theatres complex. and 3 modular theatres for emergencies and ambulatory surgeries in the Accident and Emergency Theatre complex.

Approval for the study was in accordance with Institutional guidelines. The records were further scrutinized to identify all elderly patients who had surgical procedures both elective and emergency cases. The age, sex, the surgical specialty, indication for surgery, anaesthetic technique, level of surgeon/ anaesthetist and procedures performed were recorded for every patient 65years and older. The records were reviewed and clinical variables of interest were recorded in a structured data collection form. A patient is classified as elderly if he or she is 65year or older.

Data were entered into Excel spreadsheet. Categorical data are presented as counts, frequency and percentages. Continuous data are presented as means and standard deviation (SD). Continuous data like age were compared using unpaired t-test and categorical data analyzed using Fisher Exact test.

Results

Table 1 shows the yearly distribution of elderly patients who had surgical operation in the period under review. A total of 1168 elderly patients were operated during the study period.

The sociodemographic characteristics of the elderly patients are shown on Table 2. The age ranged between 65 – 98years. The decade of 65 – 75years age group has the highest number of geriatric patients coming for surgery. There is a male preponderance of elderly surgical patients in this study; 678(58%) while 490(42%) were female.

Table 3 shows the distribution of nine subspecialties in which elderly patients presented: Ophthalmology, Urology, General Surgery, Orthopaedics, Gynaecology, ENT, Cardiothoracic Surgery, Plastic Surgery and Neurosurgery. Ophthalmology and urology services accounted for most of the patients.

Local Anaesthesia (LA) is the preferred anaesthetic technique of choice for geriatric patients coming for surgery as shown in Table 4. Approximately two-thirds of the cases were performed under Local anaesthesia 733 (62.8%). Local anaesthesia was mostly performed by the attending surgeons under monitored anaesthesia care. This is closely followed by General anaesthesia 302(25.8%) which shows one-quarter of the total cases performed under General anaesthesia.

The cadre of the attending surgeons and anaesthetist is shown on Table 5. It shows that geriatric surgeries were mainly conducted by senior personnel. Two-third was consultants 757 (64.8%) while Senior Registrars accounted for 399 (34.2%). Mostly Senior Anaesthetists offered anaesthesia to the geriatric patients. Senior Registrars 280(29.1%) were in attendance in conducting anaesthesia for the elderly while those conducted by the consultants were nearly half the number conducted by the Senior registrar.

Table 1: Yearly distribution of surgical cases

YEARS	FREQUENCY (%)
June 1997 – May 1998	**105(9.0)**
June 1998 – May 1999	**83(7.1)**
June 1999 –May 2000	**91(7.8)**
June 2000 – May 2001	**82(7.0)**
June 2001- May 2002	**76(6.5)**
June 2002 – May 2003	**120(10.3)**
June 2003 – May 2004	**103(8.8)**
June 2004 – May 2005	**85(7.3)**
June 2005 – May 2006	**89(7.6)**
June 2006 – May 2007	**85(7.3)**
June 2007 – May 2008	**95(8.1)**
June 2008 – May 2009	**79(6.8)**
June 2009 – May 2010	**75(6.4)**
Total	**1168 (100)**

Table 2: Socio-demograhics of the elderly

VARIABLES	FREQUENCY (1168)	PERCENT
Age group		
65 – 75	847	72.5
76 – 86	285	24.4
87 – 97	35	3.0
98- 108	1	0.1
Sex		
Male	678	58.0
Female	490	42.0

Table 3: Cases per specialty

CASES	FREQUENCY (1168)	PERCENT
Ophthalmology	436	37.3
Urology	246	21.1
General Surgery	224	19.2
Orthopaedic Surgery	115	9.8
Gynaecology	60	5.1
Ear, Nose and Throat	40	3.4
Cardiothoracic Surgery	20	1.7
Plastic Surgery	15	1.3
Neurosurgery	12	1.1

Table 4: Anaesthetic techniques

VARIABLE	FREQUENCY (1168)	PERCENT
LA	733	62.8
GA	302	25.8
SAB	111	9.5
EPIDURAL	20	1.7
GA+SAB	2	0.2

Table 5: Level of surgeons and anaesthetists

VARIABLE	FREQUENCY (442)	PERCENT
Surgeons		
• Consultant	757	64.8
• Senior Registrar	399	34.2
• Registrar	12	1.0
Anaesthetists		
• Consultant	130	11.1
• Senior Registrar	280	29.1
• Registrar	32	2.7
Surgeons Block		
• Local Blocks by Ophthalmologist	228	19.5
• Local Blocks by Urologist	194	16.6
• Local Blocks by Plastic Surgeons	154	13.2
• Others	150	12.8

Discussion

This study on 1168 elderly patients showed a prevalence of 22.2% of elderly patients presenting for surgery in the period under review. The results of our study shows that 72.5% of geriatric patients were 65-75 age group, with majority were male (58%). This is a reflection of the fact that males are more financially independent and make informed decision about their health unlike women who seek permission from their husband before seeking for medical help. This notwithstanding, the generally observed trend that, with improvement of surgical and anaesthetic techniques, more elderly patients are undergoing surgery.[7] In addition, 37.3% of the elderly patients in this study had ophthalmic surgery, which is the commonest procedure performed on the elderly. Cataract extraction appears the commonest ophthalmic surgery which is usually performed as a day case. Local anaesthesia is usually performed by the Ophthalmologist via peribulbar, retrobulbar or sub-tenons blocks under monitored anaesthesia care, this allow for early discharge and return to their regular lifestyle and environment. Our findings shows that Urology department has the next most commonly performed procedures 246(21%). Prostatectomy consists of the major surgeries. Open prostatectomy is the main option of surgical care in our Centre. However, some of the very elderly and affluent patients are offered trans-urethral resection of prostate (TURP) when it is applicable. One of the main challenges for the anaesthetist during

transurethral resection of prostate is blood loss which is usually difficult to quantify as it is diluted by the irrigation fluid and as such direct measurement is challenging. Other problems associated with prostatectomy especially the transurethral resection of prostrate syndrome during transurethral resection of prostate, hypotension and associated CNS symptoms of fluid absorption.

Our study shows that very senior anaesthetist and surgeons provided care for the various surgical procedures. The deployment of senior medical personnel on the surgical and anaesthetic teams underscores the importance of geriatric anaesthesia in the curriculum and practice of surgeons and anaesthetists. Only senior anaesthetists are well placed to understand the implications of the exaggerated effects of anaesthetic agents on the older patients. It is well known that all anaesthetic drugs have more complex effects on the elderly patients.[3, 4] In order to minimize unwanted events, it is imperative therefore, that specialist anaesthetists conduct the perioperative care. The maintenance of hemodynamic stability is usually difficult with older patients especially those with compromised cardiovascular system. The anaesthetist is a specialist in preventing and managing unwanted complication and also providing patients comfort by adequate pain control and environmental manipulations.

The distributions of the type of anaesthetic technique were different for elderly patients. Local anaesthesia 733(62.8%) was the major technique of choice employed in the management of geriatric patients. One of the advantages of local anaesthetic technique is that it supports ambulatory surgery and allows patients to return to their regular lifestyle and environment immediately. It is important to avoid separation from their usual environment and to prevent disruption of normal daily routines caused by a hospital admission. This may be due to avoidance of multiple pharmacological agents like opioids and benzodiazepine which exhibits age related increase in their elimination half-life resulting in a prolong duration of action. The clinical effect of this entails cautious premedication with benzodiazepine which may lead to prolonged sedation in postoperative period and dosing interval opioid may be adjusted in the perioperative analgesia. Local anaesthesia should be considered wherever possible and it is an attractive option in elderly patients. This is because single drug is used and systemic toxicity is minimal. Inhalational agents are completely avoided with the use of local anaesthesia. It is known that all inhalational agents' minimum alveolar concentration (MAC) value is reduced by 20 – 40% from young adult values. Newer inhalational agents are more insoluble and are largely excreted unmetabolised via the lungs rather than relying on organ based elimination, thus recovery after anaesthesia is likely to be more predictable.

However, general anaesthesia appears to be the next commonly used technique of choice for elderly patients coming for surgery. The choice of GA was prompted by the invasiveness of the surgery. In exploratory laparotomy, thoracic and neurosurgical cases are only amenable to general anaesthesia. A recent meta-analysis on the choice between regional anaesthesia and general anaesthesia, there is little evidence to suggest that one technique is better than other especially in the geriatric patient.[8, 9] This position may have been informed by the variety of very invasive procedures agreeable only to general anaesthesia.

One of the outcomes of the anaesthetic care for the elderly patients was the little over 4% admissions to the general Intensive Care Unit. The postoperative admission of the geriatric patient to the ICU may include haemodynamic instability, improved ongoing intercurrent medical diseases and organ support. It is not clear if these admissions were planned or were on emergency basis. Survival appears to be better with planned ICU admission than those admitted on emergency. Specifically, major cardiothoracic or neurosurgical patients often have preoperative booking of the ICU bed. This practice appears to improve the outcome as shown by the low ICU admission rate in this group of patients.

Limitations

This is a retrospective study with clear limitations. There are incomplete records or missing information. However, a retrospective study allows for the evaluation of day to day routine clinical practice devoid of the constraints imposed by the strict/rigid protocol of a prospective study. It may have been necessary to compare this population of

patients with another group; such comparison may be difficult because of the clear differences in their physiology of the geriatric population. Nevertheless, the normative data on the population of elderly patients and the common surgical procedures adds value to our care of the elderly patient

Conclusion

The age group 65-75 years had the highest preponderance for surgery and anaesthesia. Local anaesthesia is the commonly used technique of choice for geriatric patients. Cataract extraction appears the commonest procedure undertaken. Specialist Anaesthetist and Surgeons are better equipped to provide perioperative care for the geriatric patient. Senior medical personnel (surgeons and anaesthetists) should be deployed for the perioperative care of the elderly patients. The implementation of such policy may improve outcome for the elderly surgical patient.

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