International Journal of Anesthesia and Clinical Medicine
2023; 11(1): 49-57
http://www.sciencepublishinggroup.com/j/ijacm
doi: 10.11648/j.ijacm.20231101.21

Impact of Comorbidities on Cancellation of Surgery in Patients Previously Reviewed: A Prospective Observational Study

Felicia Dele Asudo

Department of Anaesthesia, University of Abuja / University of Abuja Teaching Hospital, Gwagwalada, Abuja, Nigeria

Email address:
Feliciaasudo@gmail.com

To cite this article:
Felicia Dele Asudo. Impact of Comorbidities on Cancellation of surgery in Patients Previously Reviewed: A Prospective Observational Study. *International Journal of Anesthesia and Clinical Medicine*. Vol. 11, No. 1, 2023, pp. 49-57. doi: 10.11648/j.ijacm.20231101.21

Received: May 19, 2023; **Accepted**: June 7, 2023; **Published**: June 15, 2023

Abstract: Globally patients with inter-current medical diseases are common place and are likely to present for anaesthesia and surgery at some point in their life. Surgical patients with inter-current medical diseases pose a great challenge to the anaesthetist; optimal perioperative care has to be provided to prevent adverse events, and thus reduce morbidity and mortality. Where preoperative optimization of the disease is not optimal, cancellation with its attendant consequencies becomes inevitable. This prospective observational study was carried out at the University of Abuja Teaching Hospital, Gwagwalada, Abuja between February 2018 and July 2018. All patients presenting for surgery at our general modular operating rooms formed the subjects of this study. A standardized questionnaire was used to document patient demographics, the presence and type of comorbidity, level of control of comorbidity, facility where care was being assessed for the inter-current illness, surgical diagnosis, nature of surgery and the decision or otherwise to proceed with the planned surgery. Questionnaires were administered pre induction on arrival at the Reception. A total of 215 (21%) patients had comorbidities. The cardiovascular system was the most affected, 55.8% and Hypertension (51.6%) was the most common comorbidity. There were a total of 10 (4.7%) cancellations. Cancellation was highest among the adult age group 70%, the female 80% and the Obstetric population 30%. Comorbidity is common among patients presenting for surgery. Cancellation of surgery on the day of surgery as a result of comorbidity despite preoperative review a day before surgery is possible though with a low incidence. Good preoperative review and optimization of the comorbidity will minimize this day of surgery cancellation.

Keywords: Comorbidity, Preoperative Assessment, Hypertension, Day of Surgery Cancellation, Elective Surgery, Emergency Surgery

1. Introduction

Medical comorbidities or inter-current medical diseases in surgical patients are diseases unrelated to the causality of the primary surgical finding. Globally patients with inter-current medical diseases are common place and are likely to present for anaesthesia and surgery at some point in their life even as studies indicate that comorbid conditions among surgical patients is not rare.

The magnitude of comorbid illness in patients coming for surgery varies from region to region depending on geographic setting, socio-demographic status, dietary status, ethnicity, life style, age, age studied, hereditary, geographic and environmental factors, modern international travel, the method of study and number of study participants. The incidence of day of surgery cancellation of elective surgery varies from 10% to 40% and this varies from hospital to hospital [1-5].

Surgical patients with comorbid medical diseases pose a great challenge to the anaesthetist as outcome after anaesthesia may be influenced by the presence of the comorbid medical disease. The coexistence of any medical condition in the surgical patient has the potential to increase the risk of morbidity and mortality in the perioperative period if inadequately managed [6-7].

Poor preoperative evaluation and preparation of patients with inter-current medical disease for surgery often results in cancellation or deferment of the planned surgery in order to

prevent adverse anaesthesia outcome, thus reducing morbidity and mortality. As a result, the unfit condition of patients for surgical procedures due to medical reasons is a very common reason for cancellations. Detecting and stabilizing patients with comorbid illness during preanaesthetic evaluation of the patient is thus very essential for reducing perioperative morbidity and mortality.

Dwindling economic resources and reduced manpower in the health sector requires efficient use of the available resources as cancellation of surgery has far reaching consequences such as; operating theatre under-occupancy and under-utilization with consequent low rate of efficiency and waste of hospital resources. Cancellation results in financial, logistic and psychological problems for patients and their families who have to organize a second operating date. Last-minute cancellation is a waste of time for the surgeon and any other staff who might be meeting for an agreed-upon program. It is potentially stressful and demanding to patients, relatives and their employers in terms of loss of work days and disruption of activities of everyday life, which could be emotionally very distressing to patients [4]. Cancellation of elective operations is known to increase cost, decrease efficiency, and waste time and resources [5, 8, 9].

The incidence of inter-current medical disease has been studied among Nigerians and elsewhere as well as in various disease conditions, in the obstetric population and in the elderly [1, 3, 5, 6, 7, 10-12].

Most of these studies focused on the impact of inter-current medical disease on the peri-operative course and postoperative effect of anaesthesia. A careful search of the literature did not find a study that looked at the impact of inter-current medical disease on cancellation of surgery. Hence this study determined in a prospective cross-sectional and observational pattern the incidence of inter-current medical diseases and its impact on the cancellation of surgery. This study looked at day of surgery (DOS) cancellation rate in patients who had been previously reviewed a day or few days before surgery in order to determine the effectiveness of our current method of day before surgery preoperative anaesthesia review.

2. Patients and Method

This prospective observational study was carried out in patients of all ages of either sex, coming for both elective and emergency surgeries in our institution. The study was conducted between February 2018 and July 2018. One thousand and thirty (1030) patients were studied over the period of 6 months. It was a questionnaire based study carried out by the managing anaesthetist and administered to the patient on arrival at the reception before being taken into the operating room (OR). Majority of the patients for elective surgery had been previously reviewed the day before and certified fit for anaesthesia while a few were yet to be reviewed. No patient who presented for emergency surgery had been previously reviewed. Data on patient's demography (age, sex, ASA Status), diagnosis, type of surgery, surgical specialty, nature of surgery, history of and type of comorbidity (diabetes, Ashma, hypertension etc) were recorded on a standardized questionnaire. We also inquired to know if patient was on monitored care and where care was being assessed. Where patient was not on monitored care, we sought to know the alternative care being sought and if the surgery was eventually deferred by the anaesthetist for further optimization. Cancellation was defined as any surgery scheduled on a given date that did not occur on that date. Data was analyzed using SPSS version 22. Results are presented in proportion and percentages.

3. Results

A total of 1450 patients had elective and emergency surgery during the period; however, data from 1030 (71%) patients was found to be complete and were analyzed. Demographic and clinical characteristics of patients are presented in Table 1. The mean age of the participants was 31.1 ±16.3 (SD) with an age range of 1-86years. Majority of the participants 795 (77.2%) were in the adult (non-elderly) age group of 18–64years. There were more females than males 684/ 346 with a male/female ratio of 1:2. Variability in the ASA scoring for the patients is as shown in Table 1 with ASA 1, 2 and 2E patients having the three highest incidences 34.7%, 21.7% and 20.6% respectively.

The most frequently performed surgery were Obstetric (30.4%) followed by general surgical procedures (15.7%) and Gynecological procedures (15.4%) as shown in Table 2.

Table 2 also shows that overall, 215 (21%) patients had, at least, one comorbidity while 815 (79%) had no comorbidity. More patients in the adult age group, females, Obstetric population, patients for emergency surgery had comorbid illnesses. Of the 215 patients that had comorbid illnesses, 77.2% were of the adult age group, 72.1% were females compared to males, 37.2% were from the obstetric population and 52% had emergency surgeries compared to patients that had elective surgeries.

Table 3 shows that Hypertension (51.6%) was the most common comorbidity. Other comorbidities included Preeclampsia (17.8%), Diabetes (9.8%), Ashma (4.2%) and Upper respiratory tract infection (3.3%).

Table 4 shows the system wise distribution of comorbid illnesses. Cardiovascular system was the most affected 55.8%, followed by the multisystem 15.3% and the endocrine system 9.8%. There were a total of 10 (4.7%) cancellations out of the 215 patients that had comorbid illnesses. Cancellation was highest among the adult age group 70%, the female population 80% and the obstetric population 30%. No patients who presented for Neuro surgery, Urology, Maxillofacial or plastic surgery had their surgery cancelled. Table 2.

More patients scheduled for elective procedures 90.2% had their comorbid illnesses under control compared to patients who had emergency surgeries 44.7%. No patient with comorbid illness who was schedule for an emergency procedure had their surgery cancelled. Table 5.

Table 6 shows that Seventy six percent (76%) of the

patients with comorbid illnesses were on monitored care while 52 (24.2%) were on self-medication. Majority 126 (58.6%) of the patients on monitored care received treatment in a tertiary institution. The patients on self-medication randomly purchased their drugs from pharmacy shops where they consulted pharmacists or other non-physician medical personnel in patent medicine stores. Only two patients on monitored care had their surgery deferred, while eight patients on self-medication had their surgery deferred.

Table1. *Patient's Demography.*

Age (Years)	Frequency	Percentage
Paediatrics (1-17)	204	19.8%
Adults (18-64)	795	77.2%
Elderly (≥65)	31	3.0%

	Range	Mean	Standard deviation
Age (years)	1-86	31.1	16.3

Gender	Frequency	Percentage	Male: female ratio
Male	346	33.6	1: 2
Female	684	66.4	

ASA Status	Frequency	Percentage (%)
ASA 1	357	34.7
ASA 2	223	21.7
ASA 3	38	3.7
ASA 4	1	0.1
ASA 1E	101	9.8
ASA 2E	212	20.6
ASA 3E	89	8.6
ASA 4E	9	0.9
TOTAL	1030	100 (%)

Table2. *Scheduled Surgery, Comorbid Illnesses and Cancellations According to Patient Clinical and Dermographic Characteristics.*

AGE (years)	NO OF SCHEDULED CASES (no 1030)	NO WITH COMORBIDTY (n 215)	Cancelled No (%)
Paediatrics (1-17)	204 (19.8%)	22 (10.2%)	2 (20%)
Adults (18-64)	795 (77.2%)	166 (77.2%)	7 (70%)
Elderly (≥65)	31 (3.0)	27 (12.6%)	1 (10%)
GENDER			
Male	346 (33.6%)	60 (27.9%)	2 (20%)
Female	684 (66.4%)	155 (72.1%)	8 (80%)
SURGICAL SPECIALTY			
Gynae	159 (15.4%)	25 (11.6%)	1 (10%)
Obstetric	313 (30.4%)	80 (37.2%)	3 (30%)
Orthopaedics	92 (8.9%)	25 (11.6%)	1 (10%)
General Surgery	162 (15.7)	31 (14.4%)	2 (20%)
Urology	54 (5.2)	17 (7.9%)	0
ENT	64 (6.2%)	15 (7.0)	2 (20%)
Maxillofacial	14 (1.4%)	0	0
Paediatrics surgery	92 (8.9%)	7 (3.3%)	1 (10%)
Neuro surgery	39 (3.8%)	9 (4.2%)	0
Plastic Surgery	41 (4.0%)	6 (2.8%)	0
NATURE OF SURGERY			
Emergency Surgery	418 (40.6%)	112 (52%)	0
Elective Surgery	612 (59.4%)	103 (48%)	10

Table 3. *Various Comorbid illnesses detected in the Reception.*

Diseases	No of Cases	Percentage (%)
RESPIRATORY SYSTEM		
Asthma	9	4.2
Respiratory tract infection	7	3.3
Bronchogenic CA	4	1.9
CARDIOVASCULAR SYSTEM		
Congestive cardiac failure	7	3.3
Hypertension	111	51.6
Congenital Heart disease	2	0.9
ENDOCRINOLOGY		

Diseases	No of Cases	Percentage (%)
Diabetes Mellitus	21	9.8
HEAMATOLOGICAL SYSTEM		
Sickle Cell Disease	9	4.2
Anaemia	3	1.4
INFECTIOUS DISEASE		
Sepsis	3	1.4
HIV	1	0.5
CONGENITAL ABNORMALITY		
Ano-rectal malformation	2	0.9
UROGENITAL		
Acute kidney injury	3	1.4
MULTISYSTEM		
Preeclampsia	33	15.3

Table 4. *System Wise Distribution of Comorbid illness and Cancellation.*

COMORBIDITY (n 215)	No with Comorbidity	No of Cases Cancelled
Respiratory System	20 (9.3%)	0 (0)
Cardiovascular System	120 (55.8%)	4 (40%)
Endocrinology	21 (9.8%)	1 (10%)
Haematological System	12 (5.6%)	1 (10%)
Infectious Disease	4 (1.9%)	1 (10%)
Congenital Abnormality	2 (0.9%)	0
Urogenital	3 (1.4%)	0
Multi System	33 (15.3%)	3 (30%)

Table 5. *Nature of Surgery, Control of Comorbid illnesses and Cancellation.*

Nature of surgery	Controlled		Not Controlled		Total
Emergency	55 (44.7%)		68 (55.3%)		123
Elective	83 (90.2%)		9 (9.7%)		92
Nature of surgery	Controlled Deferred	Not Deferred	Not Controlled Deferred	Not Deferred	
Emergency	0	55	0	68	123
Elective	1	71	9	11	92

Table 6. *Management of Comorbid Condition Prior to Surgery.*

TREATMENT	Frequency	Percentage of total (%)	Percentage of numbers with comorbidity	Cancelled cases
Monitored care	163	15.8%	75.8%	2 (0.6%)
Self- medication	52	5.0%	24.2%	8 (16.7%)
NA	815	1%		
Institution / Mode of Treatment Frequency Percentage				
Tertiary Institution	126	58.6%		
General Hospital	37	17.2%		
Self-medication				
Pharmacy	30	13.9%		
Patent Medicine Store	22	10.2%		
TOTAL	163			

4. Discussion

Patients in the adult age group (18-64years) had the highest incidence of comorbid illness 77.2% while only 12.6% of patients in the elderly age group (>65 years) had comorbid illnesses. Majority of the participants in the study 795 (77.2%) were in the adult (non-elderly) age group of 18–64years. This is similar to the result of Eyelade et al [7] that showed a preponderance of comorbidity in the middle age group. It is however different from the result of the study by Edonmwonyi et al [2] from Nigeria and HAQ et al [13] from India where a higher percentage of patients >60% who had comorbidity were seen in patients > 60 years of age compared to patients < 60 years. The "adult age'' group 18-64 years in our study comprises of the young adult age group (18-25years), adult (26-45years) and the middle age group (45-60 years). Similar to this study Crandon et al, [14] found out that out of a total of 2375 patients admitted into the General surgical ward, 74% were non-elderly (<60 years of age). This higher incidence of surgical patients seen in our study may have been responsible for the preponderance of comorbidity in this age group. This study focused mainly on patients seen at the reception, majority of whom had been cleared for surgery following preoperative review the day before. Thus others with comorbidity and certified not fit for surgery were not eligible for this study. A high proportion of this is expected to be among the elderly age group. Comorbidities are more

common with age as older adults are more likely to have health challenges compared to younger adults. Age may bring wisdom but it also brings a greater chance of health problems, and some health problems might require surgery to make you better. Another reason that may have been responsible for the higher incidence among the non-elderly age group is that studies indicate that the prevalence of comorbidity among the elderly varies greatly in different countries and regions, depending on the age of the population, the number of chronic diseases involved and the sampling framework [15].

Among the different types of comorbid illnesses, hypertension (111, 51.6%) was found to be the most common. This finding is similar to the results of previous studies conducted in England, Nigeria and India (63.9%, 64.3%, 55.3%) [1, 13, 16]. Previous studies from Nigeria indicate that Hypertension was also the most frequent comorbid illness seen in patients presenting for surgery [2, 3, 7]. Hypertension (HTN) is a leading risk factor for cardiovascular disease (CVD) worldwide [17]. In Nigeria, hypertension is the commonest form of cardiovascular disorder, occurring in 38% of the adult population [18]. A meta-regression epidemiologic modeling showed that age is a statistically significant determinant of HTN prevalence in Nigeria, P <.001 (Supplemental Material) [17]. There is strong evidence that HTN has become far more common among Nigerian adults in recent years and that awareness of the condition remains alarmingly low [17]. According to the study by Kayima et al [19], with increasing adult population and changing lifestyle of Nigerians, the burden of hypertension is expected to continue to increase. In this study 77.2% of the patients with comorbid illnesses were in the adult age group (>18years).

There were a total of 10 (4.7%) cancellations out of the 215 patients that had comorbid illnesses. Cancellation was highest among the adult age group 70%, the female population 80% and among the Obsteric surgical population 30%. Of the different age groups, cancellation was least among the elderly age group.

An efficient surgical service should have a low rate of cancellation of operations [8, 20]. Cancellation of elective surgical operations in hospitals carries with it undesirable consequences. Cancellations are a major drain on health resources, increase in theatre costs, decrease patient satisfaction, causes waste of operating room time and decreased efficiency. Cancellations for whatever reason generates under-utilisation of the operating theatre, a low rate of efficiency, lengthening of waiting lists and, finally, an increase of global costs. When resources are not correctly used the general population suffers, especially the underprivileged who depend on the public sector for their healthcare requirements. Cancellations result in financial, logistic and psychological problems for patients and their families, who have to organize a second operating date. An efficient surgical service should have a low rate of cancellation especially on the day of surgery. Cancellation of elective scheduled operations on the day of surgery (DOS) as seen in our study leads to an inefficient use of operating room (OR) time and a waste of resources. It also causes inconvenience for patients and families. Moreover, DOS cancellation creates logistic and financial burden associated with extended hospital stay and repetition of pre-operative preparations as well as opportunity costs of lost time and missed income. DOS cancellations are a world-wide problem with reported rates ranging from 0.37–28% in developed and from 11 to 44% in developing countries [8]. This study revealed that out of the 1030 surgical interventions that were planned only 1% (n = 10) were cancelled on the day of surgery (DOS) and this constituted (4.7%) of the 215 patients that had comorbidities. The cancellation rate of 1% in this study is lower than the reported rates of 1.9-24%, of cancellations on the day of surgery in the study by Shivakumar and Dr. Lokesh [9] while Fischer et al [21] in their study reported that almost 90% of cancellations were on the day of surgery. The cancellation rate in our study is in line with reports from developed countries while it is very low compared to reports from developing countries like Nigeria. This discrepancy might be due to differences in socio demographic characteristics, sample size, study area, and methodological differences. Beyond this, the main reason for the low cancellation rate in our study is the fact that this study only considered cancellations that were due to the presence of comorbidities that were detected on the day of surgery and needed to be further optimized. This did not include patients who had been previously reviewed the day or days before surgery and had had their surgery cancelled because they had comorbidities that required further optimization. It also did not consider other causes of cancellation. Another reason for the low cancellation rate in our study is the inclusion of patients undergoing emergency surgeries. Emergency surgeries give very little room for cancellations while deferment for a few hours may be entertained. There are numerous reasons for cancellation of elective surgical cases and these vary from one hospital to another. Reasons adduced include inadequate pre-op assessment and preparation, patient-related factors, lack of operating room time, unavailability of hospital beds, prediction bias, surgeon-related issues, Facility problems, infrastructural limitations, Administrative related challenges, Anaesthesia related problems and emergency surgery disrupting the elective list [8]. In the present study only 1% (10) of the scheduled surgeries were cancelled due to comorbidities. Cancellations of operation due to inadequate work up of important medical conditions are avoidable. The medical problems could have been identified in time and the number of cancellations on medical grounds avoided by establishing a formal liaison with the physicians. A Low surgery cancellation rate is the hallmark of an efficient surgical service, particularly in government hospitals. However the low rate seen in this study indicates a very efficient preoperative review system as most of the patients scheduled for elective surgery had been previously assessed a day or days before surgery by the anaesthetist. Studies show that preoperative anaesthesia assessment of patients whether in pre-anaesthesia clinics or a day before surgery significantly reduces operative room delays and cancellations [20].

The adult age group (17–64 years) were the highest

canceled age groups (70%) followed by 1–17 years old group (20%). In the study by Desta et al [8] the 21–30 years old age group were the highest canceled age group (23.3%) followed by the 31–40 years old group (19.9%), while in the study by Zafar et al [20] from Spain cancellations were more in patients aged 0– 10 years (13%) followed by those aged 21–30 years (9%). In the study by Mutwali et al [22] from Sudan, the highest canceled group was 61– 70 years old 31.1% followed by 51–60 years old group 25.4%. In this study there were less frequent cancellation in the elderly group (1.4%). This is similar to the study from Spain that showed less frequent cancellation in patients over the age of seventy (1.4%) unlike in the study from Sudan, where the highest canceled age group was 61– 70 years. This could be due to the fact that in this study the adult age group had the highest no and percentage of scheduled cases and the highest number of patients with comorbidity.

The majority of cancelled surgeries were Obstetric (80%), followed by general surgery (20%), and ENT surgeries (20%). This is unlike the study by Desta et al [8] where orthopedic cases (28.7%) were the commonest cancelled cases. Their finding is supported by other similar studies conducted in Hong Kong, Saudi Arabia and in Finland, where orthopedic cases were the commonest cancelled elective surgical procedures [8]. The high rate of cancellation of Obstetric cases could be due to the fact that our hospital is a tertiary referral centre for obstetric patients with a high rate of referrals from primary, secondary and private hospitals from within and neighboring states resulting in priority being given to emergency Obstetric cases, majority of whom present with severe preeclampsia with severe hypertension (systolic blood pressure>160mmHg) or hypertensive crisis (systolic blood pressure >180mmHg) that could result in cerebral haemorrhage which is the commonest cause of maternal death in patients with preeclampsia [23, 24]. Due to the risk of haemorrhage in the presence of systolic hypertension, most guidelines recommend lowering of blood pressure to a systolic level of 140–150 mmHg and a diastolic of 90– 100 mmHg [24]. In this study 33 (15.3%) of the patients with comorbid illnesses presented with preeclampsia. Of these 3 patients were cancelled.

Compared to Males cancellation was highest among the female population, 80% of cancelled cases. Similar to our study other studies found a higher cancellation rate among females compared to males [25, 26]. This is contrary to the study by Badadur et al [27] who reported higher cancellation rates among Males than in Females while Gonzalez-Arevalo et al [28] reported no gender difference. The study by Kaiye et al [26] demonstrated that the number of scheduled surgeries of males was higher than that of females (5905 to 5426), however the average cancellation rate of males was statistically less than that of females (16.7% to 18.3%) thus demonstrating that cases were more likely to be cancelled when the patient was a female rather than male. In the Kaiye study they found out that a significant number of cases of females were cancelled due to the menstrual cycle of the females. Thus, doctors or administrators should pay special attention to the physiology of females when scheduling surgery. As much as possible the surgeries of females should not be scheduled during their menstrual cycles [26].

Majority 126 (58.6%) of the patients on drugs for their comorbidity received treatment in a tertiary institution and were thus on monitored care while 52 (32%) were on self-medication and randomly purchased their drugs from pharmacy shops where they consulted pharmacists or other non-physician medical personnel in patent medicine stores. Self-medication (SM) is the selection and use of medicines by individuals (or a member of the individual's family) to treat self-recognized or self-diagnosed conditions or symptoms. As found in other developing countries, SM is common in Nigeria with a rate of 60%-90% among the population for both over the counter (OTC) and prescription medicines and almost all classes of drugs are implicated in SM. Several benefits have been linked to appropriate self-medication, however, self-medication is far from being a completely safe practice, especially in the case of non-responsible self-medication that increases the possibilities of wrong self-diagnosis and therapy, drug overdose, under dose and abuse, wrong route of administration, treatment seeking-delay, contraindications to the use of the drug, polypharmacy, delays in seeking medical advice when needed, infrequent but severe adverse reactions, dangerous drug interactions, incorrect manner of administration, incorrect dosage, incorrect choice of therapy, masking of a severe disease and risk of dependence and abuse. Incorrect self-diagnosis, delays in seeking medical advice when needed, incorrect manner of administration, incorrect dosage, incorrect choice of therapy may mask a severe disease and also result in poor control of the comorbid condition with the potential risk of cancellation of surgery as seen in our study [29, 30].

This study determined in a prospective cross sectional and observational pattern the incidence of inter-current medical diseases in patients presenting for both elective and emergency surgery and its impact on the cancellation of surgery in patients who had been previously reviewed a day (days) before surgery and found that despite preoperative review a day before surgery there may still be patients whose surgery will need to be cancelled as a result of inadequate optimization of comorbid illnesses. In order to provide safe anaesthesia it is of prime importance to identify the presence of diseases in the preoperative period [16]. An important objective of preoperative management should be to identify and reduce modifiable comorbid medical illnesses thus reducing the risk of compounding intraoperative management and affecting patients' postoperative outcomes. Preoperative assessment helps to identify prevailing comorbidity, assessment of control of pre-existing disease and optimization of patients for surgery. The expectation is that if the preoperative assessment has been well carried out then there should be close to zero cancellation on the day of surgery even as studies indicate that preoperative assessment reduces the cancellation of elective patients [20, 26, 31]. This study showed a cancellation rate of 4.7% out of the 215 patients that

had comorbid illnesses. Several reasons could be responsible for this contrary finding.

1) Currently, most preoperative preparation models are designed to tether the timing of patient evaluation in close proximity to the surgical date, thus making the medical condition of the patient as something to which practitioners must adapt. This however does not enable proactive and meaningful preoperative patient management and optimization. Consequently, when patients are seen in the preoperative clinic or the day before surgery, it is typically considered too late to address modifiable risks [31]. Where as in some institutions there are staff and resources available to coordinate last-minute assessments and investigations if needed, at some institutions like ours these resources may not be available, and cancellation would be necessary [32]. When pre-operative assessment commences on the evening preceding surgery, with some of the assessments shifting to the day of surgery cancellation is inevitable [33]. Studies indicate that inadequate preoperative comorbidity optimization were important reasons for cancellation of surgery [27].

2) There is evidence that preoperative assessment in an anaesthesia clinic can reduce the cancellation of elective patients. An exception would be a patient who experiences an adverse medical event or illness between the time of evaluation and the time of the planned surgery [31]. Recent change in medical status of patient making him/her unfit for anesthesia has also been identified as a major cause of cancellation in several studies [27, 33].

In the study by Wei Xue et al [32] medical condition change was the second most common reason for cancellation in the General OR. for in inpatient, outpatient and same day admission. Wei Xue et al [32] also observed that usually a sudden medical condition change leads to an unavoidable cancellation, however, if patients are under close monitoring, the risk can be reduced and this will also lead to decrease in case cancellation rate [32].

3) Sometimes cancellations occur due to a difference of opinion between the anaesthetist evaluating the patient and the anaesthetist assigned for the surgery. Thus it would be ideal if the same anaesthetist who performed the preoperative assessment also conducted the anaesthesia [34].

4) The aim of preoperative assessment is to identify prevailing comorbidity, assessment of control of the comorbidity and optimizing of the patient for surgery in order to provide safe anaesthesia. However when medical illnesses are identified and they are not optimized, it gives room for cancellation on the day of surgery. In the audit by Dhafar et al, [35] medical reasons (80% of non-justifiable cancellation) was the major cause of cancellation by the anaesthetist, which was either not identified earlier or when diagnosed was not optimized. In the study by Hussein et al, [34] medical problems pertaining to the cardiovascular, pulmonary or endocrine system were picked up in the clinic in six patients but no further action was taken for these to be optimized.

5) Another probable reason is inadvertently missing out on abnormal results of investigations done a day earlier, due to excess workload,

Consequent on the above, in future it is suggested to take measures to enhance preoperative assessment to mitigate its impact on cancellations [26].

5. Conclusion

This current study revealed that comorbid illness among both elective and emergency surgical patients was not rare. It confirms that doing a preoperative assessment the day before surgery is suboptimal as the opportunity to optimize is limited. Thus despite preoperative assessment the day before surgery, there is still the possibility of cancellation of elective surgery on the day of surgery. The factors responsible for this were not assessed in this study. This should be the subject of another study.

6. Limitation

The study has some limitations to be acknowledged. All anaesthetists who managed patients during the study were responsible for data collection. This resulted in some inconsistencies in the data collection that could have affected the final analysis. A single trained research assistant will give a better data collection.

Secondly, we did not assess cancellation rate due to comorbid illnesses detected when preoperative review was done the day before surgery. A further study including this would be necessary to know the actual cancellation rate, the significance compared to our finding and thus help to determine thoroughness and effectiveness of our preoperative assessment.

7. Recommendation

Comorbidity is here to stay and will only increase in prevalence as the population ages. In order to provide safe anaesthesia it is of prime importance to identify the presence of diseases in the preoperative period. Before the advent of PAC clinics, patients were admitted and evaluated a day before surgery, however doing a preoperative assessment the day before surgery is considered suboptimal as the opportunity to optimize the comorbid illness is limited. Mainly as a result of the increasing number of patients operated in outpatient surgery or after same day admission in the past decade, the timing of preoperative evaluation has shifted from the day before surgery to preoperative evaluation some weeks before surgery thus allowing for comprehensive assessment, additional evaluation and optimization of the patient's condition without delaying surgery or giving room for cancellations due to newly discovered co-morbidity. Studies have shown that preoperative anaesthesia assessment in pre-anaesthesia clinics, early detection of any comorbidity and timely optimization preoperatively significantly reduces surgical morbidity and mortality, and operative room delays and cancellations [20]. Based on the findings of this study that despite preoperative assessment the day before surgery, there is still the possibility of

cancellation of elective surgery on the day of surgery, and that preoperative anaesthesia assessment in pre-anaesthetic clinics allows for early detection and timely optimization of comorbid illnesses, we strongly recommend that all facilities adopt the practice of doing preoperative assessment in pre-anaesthesthic clinic some days to weeks before surgery in other to bring to the barest minimum cancellation on the day of surgery as a result of comorbid illnesses.

References

[1] Ayele T. Magnitude and Adverse Anaesthesia Outcome of Co-Morbid Illnesses in Elective Surgical Patients. J Perioper Med, 2022; 5 (1): 119-123.

[2] Edomwonyi NP, Imarengiaye CO. Intercurrent medical diseases: Incidence and effects on the course of anaesthesia in a tertiary hospital. Niger Postgrad Med J 2006; 13: 75-80.

[3] Soyannwo OA, Bamgbade OA, Odutola OO. Medical diseases and anaesthesia. Afr J Anaesth Intensive Care 1996; 2: 51-6.

[4] Kyei-Mensah R, Somanathan S. Medical Disease and the Anaesthetist. Proc R Soc Med. 1976; 69 (10): 731–733.

[5] Lankoandea M, Bonkoungoub P, Traorea SIS, Kaborea RAF, Ouangrec E, Pendevilled P. Cancellation of elective surgical procedures in the university teaching hospital center Yalgado Ouedraogo in Burkina Faso: incidence, reasons and proposals for improvement. South Afr J Anaesth Analg 2016; 22 (5): 140–144.

[6] Lawal I, Bakari AG. Reactive airway and anaesthesia: challenge to the anaesthetist and the way forward. Afr Health Sci 2009; 9 (3): 167-169.

[7] Eyelade O, Sanusi A, Adigun T, Adejumo O. Outcome of anesthesia in elective surgical patients with comorbidities. Ann Saudi Med. 2016; 15 (2): 78-82.

[8] Desta1 M, Manaye A, Tefera A, Worku A, Wale A, Mebrat A, Gobena N. Incidence and causes of cancellations of elective operation on the intended day of surgery at a tertiary referral academic medical center in Ethiopia. Patient Safety in Surgery 2018; 12: 25-30.

[9] Shivakumar G, Lokesh VC. Reasons and appropriate measures to circumvent cancellation of elective surgical cases: A clinical audit of a government teaching hospital. International Journal of Medical Anesthesiology. (IJMA). 2021; 4 (1): 06-10.

[10] Weiniger CF, Einav S, Elchalal U, Ozerski V, Shatalin D, 'Ioscovich A, Ginosar Y. Concurrent medical conditions among pregnant women - ignore at their peril: report from an antenatal anesthesia clinic. Isr J Health Policy Res 2018; 7: 16 doi: 10.1186/s13584-018-0210-7.

[11] Adams JP, Murphy GP. Obesity in anaesthesia and intensive care Br. J. Anaesth. (2000) 85 (1): 91-108. doi: 10.1093/bja/85.1.91.

[12] Faponle FA, Agbakuru A. Medical problems in gyriatric patients presenting for surgery at the Wesley Guild Hospital Ilesha, Nigeria. Afr J Anaesth and Intensive care. 1997; 3: 38-40.

[13] Haq ZA, Murthy P, Malik I, Lahori VU, Chaudhary S, Ahuja S. Detection of comorbid illnesses during pre-anaesthesia evaluation in a university teaching hospital: A prospective observational study. Natl Med J India 2014; 27 (5): 256–8.

[14] Crandon IW, Harding H, Carpenter R, Branday JM, Simeon DT. Surgery in the Elderly: Is Age a Risk Factor? West Indian Med J. 2005; 54 (3): 171-5.

[15] Fan ZY, Yang Y, Zhang CH, Yin RY, Tang L, Zhang F. Prevalence and Patterns of Comorbidity Among Middle-Aged and Elderly People in China: Inter J Gen Med 2021; 14: 1449–1455.

[16] Jacob M, Singh LCI, Paul D, Krishnakumar M, Kulkarni SN. The Prevalence of Different Comorbidities among Patients Reporting To Preanaesthetic Clinic in a Tertiary Care Hospital: A Prospective Observational study. Intern J Biomed Research (IJBR) 2016; 7 (9): 658-662.

[17] Adeloye D, Owolabi EO, Ojji DB, Auta A, Mary T, Dewan MD, Timothy O, Olanrewaju MD, Okechukwu S, Ogah MD, Omoyele CM, Ezeigwe MD, Rex G. Mpazanje MD, Muktar A, Gadanya MD, Agogo EMD, Alemu W, Akindele O, Adebiyi MD, Michael O, Harhay. Prevalence, awareness, treatment, and control of hypertension in Nigeria in 1995 and 2020: A systematic analysis of current evidence. J Clin Hypertens. 2021; 23: 963–977.

[18] Odili AN, Chori BS, Danladi B, Nwakile PC, et al. Prevalence, Awareness, Treatment and Control of Hypertension in Nigeria: Data from a Nationwide Survey 2017. Global Heart. 2020; 15: 47: DOI: https://doi.org/10.5334/gh.8481-13.

[19] Kayima J, Wanyenze RK, Katamba A, Leontsini E, Nuwaha F. Hypertension awareness, treatment and control in Africa: a systematic review. BMC Cardiovasc Disord 2013; 13: 54. doi: 10.1186/1471-2261- 13-54 PMID: 2391515.

[20] Zafar A, Mufti TS, Griffin S, et al. Cancelled elective general surgical operation in Ayub teaching Hospital. J Ayub Med Coll Abbottabad. 2007; 19: 64–66.

[21] Fischer SP. Development and effectiveness of an anesthesia preoperative evaluation clinic in a teaching hospital. Anesthesiology1996; 85: 196–206.

[22] Mutwali IM, Abbass AM, Elkheir IS, Arbab SS, Bur A, Geregandi T. Cancellation of elective surgical operations in a teaching hospital at Khartoum Bahri, Sudan. Sudan Med Monit. 2016; 11 (2): 196. DOI: 10.4103/1858-5000.185230. Corpus ID: 77913052.

[23] Godwin O. Akaba GO, Anyang UI, Ekele BA. Prevalence and maternal - fetal outcomes of preeclampsia/ eclampsia amongst pregnant women at a teaching hospital in north central Nigeria: a retrospective crosssectional study. Clin Hypertens 2021; 27: 20-29 https://doi.org/10.1186/s40885-021-00178-y

[24] Dennis AT. Management of pre-eclampsia: issues for anaesthetists. Anaesthesia 2012; 67: 1009–1020.

[25] Demilew CB, Yisak H, Terefe AG. Magnitude and causes of cancelation for elective surgical procedures in Debre Tabor General hospital: A cross-sectional study. SAGE Open Medicine 2021; 9: 1-6.

[26] Yu k, Xie X, Luo L, Gong R. Contributing factors of elective surgical case cancellation: a retrospective crosssectional study at a single-site hospital. BMC Surgery 2017; 17: 100-107. DOI 10.1186/s12893-017-0296-9.

[27] Karki OB, NK, Timilsina B. Cancellation of Elective General Surgical Operations on the Day of Surgery. J Nepal Health Res Counc 2020; 18 (47): 201-4.

[28] Gonzalez AA, Gomez-Arnau, Delacruz, DelaCruz FJ, Marza JM, Ramirez S, Corral EM, Del-valle, S. Causes for cancellation of elective surgical producers in a Spanish general hospital. Journal of the Association of Anaesthesia of Great Britain and Ireland, 2007: 64: 487-493.

[29] Ayanwale MB, Okafor I P, Odukoya OO. Self-medication among rural residents in Lagos, Nigeria J Med Tropics 2017; 19 (1): 65-71.

[30] Ruiz MS. Risks of self-medication practices. Curr Drug Saf 2010 Oct; 5 (4): 315-23. doi: 10.2174/157488610792245966.

[31] Aronson S, Martin G, Gulur P, Lipkin ME, Lagoo-Deenadayalan SA, Mantyh CR, Attarian DE, Mathew JP, Kirk AD, Preoperative Optimization: A Continued Call to Action 2019 Intern Anesth Research Soc. 2020; 130 (4): 808-810.

[32] Xue W, Yan Z, Barnett R, Fleisher L, Liu R. Dynamics of Elective Case Cancellation for Inpatient and Outpatient in an Academic Center. J Anesth Clin Res. 2013; 4 (5): 314–311.

[33] Olson RP and Dhakal IB Day of surgery cancellation rate after preoperative telephone nurse screening or comprehensive optimization visit. Periop Med 2015; 4: 12-20.

[34] Hussain AM, Fauzia FA. Anaesthetic reasons for cancellation of elective surgical inpatients on the day of surgery in a teaching hospital. J Pak Med Assoc 2005; 55 (9): 374- 378.

[35] Dhafar KO, Ulmalki MA, Felemban MA, et al. Cancellation of operations in Saudi Arabian hospitals: frequency, reasons and suggestions for improvements. Pak J Med Sc. 2015; 31 (5): 1027–32.