PREMEDICATION IN ELECTIVE ADULT GENERAL SURGICAL PATIENTS AT THE KENYATTA NATIONAL HOSPITAL

A DISSERTATION SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF THE DEGREE OF MASTER OF MEDICINE IN ANAESTHESIA OF THE UNIVERSITY OF NAIROBI

Dr. Jimmie Githongo Kabugi

2006
DECLARATION

This dissertation is my original work and has not to my knowledge been submitted for a degree in any other university.

Dr. Jimmie G. Kabugi.

Date

This dissertation has been submitted for examination with my approval as university supervisor.

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Date
DEDICATION

To Carol who has been a wonderful spouse and a source of strength during my M. Med Programme.

To my son Jonathan for shining joy and happiness in my life.

To my mother Mary who taught me the value of hard work.
AKNOWLEDGEMENTS.

I wish to express my heartfelt gratitude to the following people.

My family for their unwavering support and unconditional understanding during a very trying moment in my life.

Dr T. M. Chokwe for his professional guidance throughout the M.Med programme and for being a true teacher and mentor. Without his support this study would not have been possible.

Mr Raymond from the Department of Paediatrics and Child Health for his advice on all the analytical issues in this study.

Fellow registrars in the Department of Surgery (Division of Anaesthesia) for their support and encouragement.
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ABSTRACT.

Objective: To evaluate the practice of preoperative premedication in adult elective general surgical patients in Kenya.

Design: Cross sectional study.

Setting: Kenyatta National Hospital.

Subjects: Seventy five adult elective general surgical patients.

Results: Nineteen percent of patients had their premedication prescriptions written by staff from the department of anaesthesia while 81 % of patients had their premedication prescriptions written by staff from surgery. Twenty-one percent of patients got a preanaesthetic review while 79 % did not. All patients had standard premedication with atropine 0.6 mg and pethidine 50 mg both given intramuscular. Five percent of patients had induction of anaesthesia half an hour after premedication, 27 % had induction 1 hour post premedication while 68 % of patients had induction over 2 hours post premedication. Eight percent of patients had hypertension, 4 % renal failure, 3 % ischaemic heart disease, 3 % asthma, 3% had diabetes mellitus, and 28 % were elderly.

Conclusion: The practice of premedication is poorly done at Kenyatta National Hospital. Most patients are given atropine and pethidine as standard premedication regardless of primary pathology, concurrent disease, concurrent drug therapy, weight or age. There are no protocols/guidelines for premedication at the moment.
SUMMARY

Premedication before local and/or general anaesthesia and surgery is an important aspect of comprehensive perioperative clinical care of patients. It confers several desired and sometimes mandatory effects.

These desired effects include reduced anaesthetic requirements, airway secretions, anxiety, incidence of arrhythmias; analgesia, better and smoother induction of general anaesthesia. Additional benefits include a reduction in intraoperative dream and recall as well as incidence of post operative nausea and vomiting and finally attenuation of preexisting disease.

Although not all patients will require all of pre anaesthetic pre medication, aspects of premedication that are important to a specific patient need to be identified and addressed during the pre anaesthetic visit. It is during this visit that the premedication is prescribed.

Indeed all that some patients require is an explanation of the planned procedure, planned anaesthetic technique and counseling to allay anxiety. This is also done at the time of the preoperative visit when the anaesthetist tries to gauge the anxiety level of the patient.

Files belonging to seventy five patients going for adult elective general surgical operations were included in the study. A data capture instrument was used to gather information regarding age, gender, type of operation, anaesthesia given, presence of concurrent illness, history of allergies/atopy, premedicant drugs, route of premedication, premedication prescriber,
interval between premedication and induction of anaesthesia, presence of a preanaesthetic review, and concurrent drug therapy.

The majority of patients were male. Forty percent were aged between 31 and 60 years. Most had abdominal surgery. Other types of surgery included perineal surgery, breast surgery, thyroid surgery. General anaesthesia was the commonest type of anaesthesia.

Six percent of the patients had positive histories for atopy or allergy mainly to sulphur based drugs. Only 19 % of premedication prescriptions were written by staff/students from the department of anaesthesia.

The median time interval between administration of intramuscular premedication and induction of anaesthesia was 2 hours. Majority of patients had induction of anaesthesia 2 hours after premedication; only 5 % had induction within 30 minutes post premedication.

Eight patients had hypertension, 3 had renal failure 2 had ischaemic heart disease, 2 with asthma, 2 diabetes mellitus, 1 with hyperthyroidism, 1 with liver disease and 1 with a psychiatric illness. All patients received the same premedicant drugs i.e. atropine 0.5 mg and pethidine 50 mg both given intramuscularly.
INTRODUCTION

Premedication is the administration of pharmacological agents before anaesthesia and surgery in an attempt to ameliorate those aspects of anaesthesia and surgery that are undesirable while at the same time augmenting the desirable effects.

It alleviates anxiety, provides pre-emptive analgesia, smoothens induction of anaesthesia, attempts to ensure hemodynamic stability, and may even serve to protect the airway when anaesthetics that promote hypersalivation are used.

Drugs commonly used include sedative-hypnotics, anticholinergic agents, analgesics, antihistamines, antacids and antibiotics. Most of these agents are administered intramuscularly half an hour before induction of anesthesia though some can be started the night before surgery. This depends on the premedication prescription written during the preanaesthetic visit and the desired therapeutic/pharmacological profile of the agent used.

Generally premedication should be tailored to the patient’s psychosocial, physiological and even cultural needs. The type of anaesthetic and planned surgical procedure is also of paramount importance when deciding on premedication.
STATEMENT OF THE PROBLEM

Before administration of any type of anaesthetic technique, a preanaesthetic visit is mandatory. This visit serves to familiarize the anaesthetist with the patients and identify any considerations that may contribute to the safe management of anaesthesia.

Certain types of operations demand that some aspects of premedication be looked into. For instance strabismus surgery demands that nausea and vomiting be adequately addressed preoperatively, intra operatively and post operatively.

Other disease conditions contraindicate the use of certain premedicant drugs. Raised intracranial pressure for example contraindicates the use of sedative premedication especially opioid and opioid like drugs.

Knowledge of current and safe premedication practice will ensure that anaesthesiologists do not delay patients premedication when needed and that they do not administer premedication when it is contraindicated. This will ensure that the anesthesiologist prescribes valid, sensible and safe premedication following careful preanaesthetic visits.

A review of premedication practice will also go a long way in putting forward valid recommendations that will greatly enrich the pre anaesthetic visit and also facilitate patient acceptance of anaesthesia.
LITERATURE REVIEW

The History of Premedication

The term premedication was coined by MacMechan in 1920 though the concept had been in use for some 70 years prior.

Claude Bernard described the use of preliminary premedication to sedate animals before anaesthesia. He observed that if morphine was given to a dog before chloroform, anaesthesia was achieved more rapidly, more smoothly and with a smaller dose of chloroform.

Morphine was implicated for the arrhythmias arising during anaesthesia and pharmacological trials established that atropine could prevent them or at least reduce their incidence.

Atropine was then noted to have an antisialogogue effect which was considered an unnecessary side effect but its importance became apparent after the introduction of ether in 1846 by W.T.G. Morton which was associated with significant salivation at administration.

Since then, the most common and robust premedication regime has remained the opioid-anticholinergic combination.
**General Remarks**

The broad objectives for premedication include:

1. To allay the patients fears and anxiety.
2. Minimize unwanted side effects of anaesthesia.
3. To prevent autonomic reflexes.
4. To smoothen the administration of anaesthesia.

The choice of premedication drugs used depends on several factors including the patient’s weight, medical condition, psychosocial needs, planned surgical procedure, anaesthetic technique, and finally the anaesthetist’s past clinical experience.

Premedication serves to address certain patient’s needs and requirements. The considerations include anxiolysis, amnesia, analgesia, antisialogogue, antiemesis, adjuncts to anaesthesia, antivagal action, antacid, antihistamine, antibiotic, antithrombotic and attention to pre-existing disease. These are also generally considered as the 12 A’s of premedication. It is therefore clearly evident that the use of standard premedication for all patients is not applicable.

The pre anaesthetic visit serves to identify which of these considerations need to be addressed and whether pharmacological intervention is necessary.
Anxiolysis

Anxiety is a troubled feeling in the mind caused by fear and uncertainty about the future and is the single most important purpose of premedication for most patients.

The incidence of pre operative anxiety is 60-80% and is higher in females and those having their first operation.

Patient fears include fear of unconsciousness (most common), fear of death, fear of an unfavourable surgical outcome, fear of not being unconscious (awareness), fears of experiences related by others and lastly previous personal experiences.

Physiological manifestations of anxiety include vasoconstriction making venous access/cannulation difficult, multiple arrhythmias and vasovagal or syncopal attacks which may be fatal. These can be attributed to release of stress hormones including β endorphins and catecholamines.

Sedative premedication is known to reduce the secretion of these stress related hormones and it has been shown that those patients undergoing major surgical procedures would require relatively more sedative premedication than those undergoing minor surgery.

It should be noted that sedative premedication should not lessen the need for kind and sympathetic care for patients at a time of great stress.
Benzodiazepines such as diazepam, lorazepam, temazepam and midazolam are the mainstay of sedative and anxiolytic premedication. Opioids, phenothiazines and anticholinergics can also be used but they have some unwanted side effects including respiratory depression with opioids, restlessness with barbiturates and anticholinergics and a dry mouth with anticholinergics

Diazepam has several advantages such as better anxiolysis than morphine and other opiates, good oral bioavailability, peak effect in 30 – 60 minutes after oral administration and a lack of emetic property

Disadvantages include pain on intramuscular injection due to propylene glycol, slow irregular absorption if given intramuscularly and a long half life, hence inappropriate for short procedures

Combinations of different anxiolytics may provide more desirable profiles. Benzodiazepines in combination with anticholinergics and opiates may provide easily arousable patients who can tolerate multiple invasive pre-operative anaesthesia procedures such as vascular cannulations and can go through relatively smooth induction of general anaesthesia

Anxiolytic premedication such as ketamine and midazolam may also be administered nasally in paediatrics to allow parental separation free from anxiety.
Modification of dosages and types of sedative premedication is determined also by the underlying pathophysiological circumstances in the patient. Sympatholysis for example may not be desirable in certain cardiac patients who physiologically are dependent on an enhanced sympathetic tone.

Similarly contraindications to sedative premedication include severe lung disease, hypovolaemia, impending airway obstruction, increased intracranial pressure, depressed baseline mental status and patient refusal.

Certain patients may only require an explanation of the procedure, exposure to patients who have undergone similar procedures or counseling. These may result in a calm patient not requiring any sedative premedication.

**Analgesia**

Analgesia is the loss of ability to appreciate pain and it is one of the components of balanced anesthesia.

Analgesic premedication is more important if a patient has preoperative pain. Premedication analgesia also reduces the dose of anaesthetic agents and improves patient comfort in the immediate perioperative period.

Pain must be handled seriously by anaesthesiologists as it affects patient’s hemodynamics and the stress response to surgery. Pain is even recognized as a cause of post operative nausea and vomiting.
Opioids are the premedicant drugs of choice but may cause respiratory depression which may increase morbidity in a variety of conditions that cause raised intracranial pressure.

NSAIDS that are long acting give background analgesia onto which perioperative opioids provide an enhanced analgesic effect and with a smaller incidence of adverse drug reactions. Such NSAIDS include ketoprofen, piroxicam and diclofenac\textsuperscript{3,14,16,17,18}.

Though NSAIDS may be associated with interference with blood clotting mechanisms, there is minimal risk to the performance of central neuraxial blockade unless other anticoagulant agents have also been administered\textsuperscript{19}.

The oral route for analgesic premedication provides analgesia and avoids the problems of parenteral and rectal administration\textsuperscript{20}.

**Amnesia**

The word amnesia means loss of memory\textsuperscript{6}. Patients may recall actual intraoperative events or dream intra operatively and recall the dreams as intraoperative events.

Loss of memory of events after administration of a drug reduces the risk of intraoperative awareness and avoids unpleasant memories that may cause difficulties especially if subsequent operations are to be carried out\textsuperscript{23}.
Premedication may be aimed at reducing both recall of intraoperative events and intraoperative dreams. Opioid premedication reduces the incidence of intraoperative dreaming while halothane abolishes it completely.\(^{22}\)

Premedication with diazepam 5mg orally two hours before surgery reduces incidence of intraoperative recall but increases the incidence of dreams.\(^{30}\)

**Antisialogogues**

Earlier inhalational anaesthetics such as ether and even some anaesthetics in current use like ketamine are associated with excessive salivation which may prove troublesome during anaesthesia necessitating the use of antisialogogues.\(^{23}\)

Situations such as intraoral surgery, awake fibreoptic intubation or ketamine anaesthesia demand a dry airway and also this is preferable in infants where even minimal secretions may cause significant changes in airflow resistance.\(^{23}\)

The airway glands are innervated by parasympathetic nervous system with muscarinic cholinergic receptors. To achieve a drying effect, anticholinergic agents are employed. The most common anticholinergic agents used in anaesthesia are atropine, hyoscine and glycopyrronium.\(^{23}\)

Desirable effects of anticholinergic agents include antisialogogue effect, prevention of reflex bradycardia, sedation, amnesia and an anti emetic effect.
seen with hyoscine. Side effects include tachycardia, reduction in the lower esophageal sphincter tone, mydriasis and cycloplegia, pyrexia especially in children, a 20-25% increase in physiological dead space and excessive drying of the mouth.

The antisialogogue effect has also been shown to result in speech difficulty and an increased predisposition to trauma at laryngoscopy or airway manipulation due to a dry sticky mouth.

Atropine and hyoscine are tertiary amines which cross the blood brain barrier and may be associated with the central anticholinergic syndrome which may manifest as post operative confusion, delirium, agitation and restlessness.

On the other hand, glycopyrronium has no central effects, has a longer duration of action, causes less heart rate changes than atropine and can be used in combination with physostigmine to treat the central anticholinergic syndrome.

**Antiemetics**

Many inhalational and intravenous anaesthetic agents used during surgery are associated with post operative nausea and vomiting. Routine perioperative enquiries have shown that post operative nausea and vomiting rank higher than pain in feared outcomes by patients.
Post operative nausea and vomiting causes patients distress, aspiration of stomach contents (Mendelson's syndrome), limitation of analgesia, poor surgical outcomes in eye, head and neck, esophageal and abdominal (wound dehiscence) surgery, dehydration, delayed oral intake, delayed mobilization and delayed hospital discharge. This generally translates to increased morbidity.

Apart from the anaesthetic agents, multiple other factors have been associated with post operative nausea and vomiting including patient factors like obesity, diabetes mellitus, female gender and certain types of eye, ear, upper gastrointestinal tract and gynaecological surgery.

Antiemetics should preferably be used at the end of surgery as drugs used preoperatively may have worn off upon completion of surgery. Measures used to reduce PONV include adequate preoperative gut preparation, acupuncture and suggestion counseling.

Pharmacological agents used preoperatively include phenothiazines, cyclizine, metoclopramide and the 5 HT receptor antagonists. Phenothiazines are very effective antiemetics but cause excessive sedation and delayed recovery. Cyclizine an antihistamine is effective but shorter acting than premedicant opioids hence does not offer protection against late PONV.

Metoclopramide is a gastrointestinal prokinetic with antidopaminergic action that depresses the chemoreceptor trigger zone. However its effective dose of 20mg preoperatively is associated with a high incidence of restlessness associated with extra pyramidal symptoms.
The 5HT (serotonin) receptor blockers are effective antiemetics but are expensive and are not necessarily superior antiemetics but have a better adverse effect profile.\(^{25}\)

Midazolam decreases anxiety and dopaminergic input to the chemoreceptor trigger zone. It also reduces serotonin release and has therefore been shown to have antiemetic properties.\(^{26}\)

**Adjuuncts to anaesthesia**

Premedication may serve to reduce anaesthetic requirements, make induction smoother and allow a less exciting second stage of anaesthesia. For instance, premedication with 5µg/kg of clonidine 90min preoperatively orally reduces propofol requirements for laryngeal mask airway insertion and also uncontrolled movements during induction of general anaesthesia.\(^{28}\)

Midazolam 0.05mg/kg orally 20 minutes before induction of general anaesthesia reduces the dose of propofol required to attain multiple anaesthetic end points without affecting the hemodynamics in otherwise healthy populations.\(^{29}\)

Sedative premedication reduces incidence of awareness at tracheal intubation and reduces involuntary movements characteristic of methohexitone and etomidate especially if a premedicant opioid is used.\(^1\)

Post operative delirium and excitement of ketamine may be reduced by premedicant use of paparevetum, droperidol or a benzodiazepine.\(^1\)
Antivagal action

Significant vagal reflexes were first noted in the use of chloroform anaesthesia necessitating the use of agents to reduce vagal tone. Even though chloroform anaesthesia is no longer in practice, other factors that result in significant vagal stimulation have been appreciated.

Surgical stimulation even with a balanced anaesthetic technique may be associated with bradycardia. This may be seen with stretching of sphincters, traction of gut and the oculocardiac reflex associated with ophthalmic and facial operations. Similarly, electroconvulsive therapy can also result in bradycardia.

Anticholinergic premedication prevents this vagal response and is sometimes even mandatory especially in electroconvulsive therapy where intravenous administration just prior to the procedure prevents the associated vagal reflexes.

Similarly, anticholinergic agents may be used to attenuate the vagal effects that may result from the use of certain agents that are adjunct in anaesthesia. These include the bradycardia of repeated succinylcholine, use of neostigmine or even propofol in patients already having bradycardia.

However, anticholinergic agents cause tachycardia and this may not be tolerated well by certain groups of patients. These include certain groups of patients such as those with ischaemic heart disease. Atropine should also be
used cautiously in patients with narrow angle glaucoma as it increases intraocular pressure, prostatic hypertrophy and bladder neck obstruction where it would cause retention of urine 14.

**Antacids**

During emergency anaesthesia, one of the commonest and most devastating hazards is regurgitation of gastric contents and aspiration into the tracheobronchial tree while the protective laryngeal reflexes are absent 32.

Situations in which vomiting or regurgitation are likely to occur include late pregnancy, peritonitis, metabolic ileus (hypokalemia, uremia, diabetic ketoacidosis), drug induced ileus, bowel obstruction, shock, fear, pain, anxiety, deep sedation, obesity and patients undergoing emergency anaesthesia with recent fluid or food intake 32.

Aspiration of more than 25ml gastric content at a pH of less than 2.5 causes aspiration pneumonitis (Mendelson’s syndrome). Ranitidine 100-150mg orally 2 hours before surgery or 6 hourly throughout labour prevents this syndrome 5.

In obstetric anaesthesia, sodium citrate or sodium bicarbonate 30mls should be combined with the H<sub>2</sub> blocker to neutralize residual gastric contents 31.
Antihistamine action

Drugs used in anaesthesia may have the unwanted property of histamine release causing uncomfortable and sometimes life threatening anaphylactoid reaction. Antihistamines may have a role against such secreted histamine.

Important classes of drugs that cause histamine release include benzylisoquinolinium muscle relaxants like atracurium and colloid plasma substitutes such as hemacel.

Atopic individuals are especially at risk and antihistamine premedication should be considered. Both $H_1$ and $H_2$ receptor blockers should be administered.

Antibiotics

Patients with valvular heart disease, artificial valve prostheses, congenital heart disease, prosthetic joints and patients going for coronary artery bypass grafting require antibiotic premedication as prophylaxis especially against bacterial endocarditis, and after surgery.

Effective antimicrobial prophylaxis should provide adequate bactericidal blood and tissue concentrations of relevant antibiotics during procedures where bacteria may be released or encountered such as bowel surgery.

Antibiotics administered may be regulated by the type of surgical procedure with attendant risk of contamination and the patient’s tolerance profile or
controlled long term prophylaxis as occurs in patients with ischaemic heart disease.

The use of perioperative antibiotics is also applicable especially in patients requiring gut preparation and sterilization as occurs in liver disease¹.

**Antithrombotic action**

Several risk factors predispose patients to development of deep venous thrombosis and the attendant pulmonary thromboembolism. These include polycythemia, obesity, malignant disease, post operative immobility, pelvic surgery, age greater than 40 years, lower limb surgery, estrogen containing contraceptive pills ¹. Such patients require premedication with anticoagulant drugs such as heparin, as well as up to seven days postoperatively³.

Hazards of heparin include intraoperative surgical bleeding, increased risk of postoperative hematoma, increased risk of bleeding from active peptic ulcers, increased risk of bleeding from vascular lesions and heparin induced thrombocytopenia ¹.

Lower molecular weight heparins are pharmacodynamically superior in that they are once daily drugs. They may also be less hazardous in terms of causing hemorrhage and are thus claimed to be superior to unfractionated heparin ³.
JUSTIFICATION OF THE STUDY

The administration of anaesthesia involves life support on the patients to allow complex surgical procedures to be undertaken on patients who are at times highly unstable.

It is therefore important to maintain utmost safety during the administration of anesthesia and premedication goes a long way in ensuring patient safety or at least ameliorating the dangers of surgery and anaesthesia.

Premedication also entails ensuring the patient’s comfort and peace of mind and may endeavor to cause amnesia of any unpleasant or painful events at induction of anaesthesia and performance of surgery.

Aspects of premedication that contribute to anaesthetic practice include timing, rationale, route of administration and type of drugs used. It is these aspects of premedication that this study will evaluate.

Routine use of adequate and appropriate premedication is known to improve patients’ acceptance of anaesthesia and surgery. This is important when one considers that patient’s refusal is one of the absolute contraindications to an anaesthetic technique.

There are no locally published data in this important aspect of comprehensive perioperative care. It is only after comprehensive review of
the local practices that valid, practical and plausible recommendations can be advanced on improving premedication practice.

OBJECTIVES OF THE STUDY

Broad Objective

To evaluate the practice of preoperative premedication in adult elective general surgical patients at Kenyatta National Hospital.

Specific Objectives

1. To determine the most commonly used drugs for premedication at Kenyatta National Hospital.
2. To assess the level of chronic co-morbidity in adult elective surgical patients.
3. To assess how co-morbidity affects premedication in Kenyatta National Hospital.
4. To assess how drugs frequently used by patients in Kenyatta National Hospital affect the practice of premedication.
5. To assess how premedicant drugs in Kenyatta National Hospital are administered.
6. To make recommendations on improvements on premedication practice in Kenyatta National Hospital.
METHODOLOGY

Study Design

This was a cross-sectional study. After approval from the Kenyatta National Hospital Ethics and Research Committee, and after giving an explanation of the intended study to the patients and obtaining informed consent, data was extracted from files of adult general surgical patients by use of a proforma.

Study Site

This study was carried out at the Kenyatta National Hospital, Nairobi, Kenya. This is a 2000 bed hospital that is also a Referral Hospital for East and Central Africa. It also serves as a Teaching Hospital for several institutions notably the University of Nairobi, the Medical Training College and other medical colleges that send their students to the hospital for attachments.

Kenyatta National Hospital boasts some of the most highly skilled medical staff in the country including surgeons, physicians, nurses and other paramedical staff. It carries out most general and highly specialized operative procedures in over sixteen operating rooms.
Study Population

The study included the files of seventy five patients undergoing elective general surgical procedures at the Kenyatta National Hospital in the months of May and June 2006.

Inclusion criteria

a. Age above 18 years.
b. Elective procedure.
c. General surgical procedure
d. Informed consent obtained

Exclusion criteria

a. Patients below 18 years of age
b. Patients undergoing specialized procedures such as orthopedics, neurosurgery, ENT, cardiothoracic, and plastic surgery
c. Patients undergoing emergency procedures
d. Patients not willing to participate in the study.

Sample size

The sample size was calculated according to the formula\(^{36}\)

\[
n = Z_{\sqrt{2}/2} \, \frac{P(1-P)}{d^2}
\]

\(n = \text{Sample size}\)

\(Z_{\sqrt{2}/2} = \text{The standard error of the mean corresponding to } 95\% \text{ confidence interval. This limit is given by } p=0.05 \text{ and the corresponding value determined from a } t \text{- table is 1.96}\)

\(d = \text{The target margin of error or the absolute precision which is } 5\%\)
The estimated percentage of adult general surgical patients who get an opioid – anticholinergic premedicant.

\[
P = 1.96^2 \times 0.95(1-0.95) = 73
\]

**Sampling technique.**

Consecutive sampling was used.

**Data collection instruments**

A proforma was administered on the patients’ files to generate data on the conduct of premedication in KNH. Patients’ files were used to generate data.

**Study Procedure**

Patients’ files were reviewed on the evening of surgery to extract the data on age class, sex, type of surgery, type of anaesthetic, allergy profile, co-existent illnesses, concurrent drug therapy and presence of a preanaesthetic review. This ensured that patients who are discharged a day or two after surgery are not missed out. The investigator collected the data with the help of a suitably trained assistant to minimize errors, delays or confusion.

**Data Management and Analysis**

The completed proforma was cleaned and verified. The responses were classified then coded and tallied. It was then entered into a computer and
analyzed using the statistical package for social science software (SPSS), Microsoft word, and Excel packages. The results were then displayed in graphs, pie charts, percentages, means, medians and standard deviations were also be used.

ETHICAL CONSIDERATIONS

The study was approved by the Kenyatta National Hospital Ethics and Research Committee in 2006. At the hospital, permission to review the files was also sought from the patients by use of an elaborate informed consent form. All patients were above the age of eighteen years and it was only after obtaining informed consent that a patient was enrolled in the study.

None of the study participants were obliged to enroll in the study and there was nothing to be gained or lost either materially or otherwise from accepting to join or declining to enroll in the study. Participants’ names or names of medical practitioners were not required on the data collection instrument.

The study did not involve any invasive procedures and no harm was expected to come to the participating patients either directly or indirectly as a result of participating in this study.
RESULTS.

Socio-demographic characteristics.

A total of seventy five patients anaesthesia protocols were reviewed in this study. Of these 57% were for male patients and 43% were for female patients. Age range was between 18 and 103 with a median class of 31 to 60 years.

![Sex Distribution](image)

Figure 1  Sex Distribution

40% of all adult general surgical patients were aged between 31 and 60 years. 32% were aged between 18 and 30 years while 28% were more than 60 years old.
53% of all adult general surgical patients had abdominal operations, perineal surgery accounted for 21% of operations, breast surgery accounted for 13% while thyroid surgery had 6%. Other operations accounted for 6%.
Figure 3  Type of Surgery done.

General anaesthesia accounted for 88% of anaesthetics given for adult general surgical operations while 12% of these patients received a spinal anaesthetic.
All patients in this study had premedication prescribed and administered. Only 19% (14) of premedication prescriptions were written by staff from the department of anaesthesia. These included consultant anaesthesiologists, anaesthesia residents and clinical officers training to be anaesthetists. 81% (61) of premedication prescriptions were written by surgical ward staff mainly surgical registrars and interns working in surgical wards.

<table>
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<th>Prescriber</th>
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<td>Surgery</td>
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Table 1 Premedication Prescriber
Six percent of patients in this study had a positive atopic history elicited and these were mainly previous reactions secondary to suphonamide exposure especially septrin and fansidar. This data represents information that had been gathered by the ward clinicians prior to the operation. In seventy one patients, a history of atopy was not elicited.

The median time interval between the administration of intramuscular premedication (with pethidine and atropine) and induction of anaesthesia in the patients reviewed was 2 hours. Majority (45%) of patients had induction of anaesthesia two hours after intramuscular premedication while 27% had induction one hour after premedication. 23% had induction more than two hours after premedication. 5% of adult general surgical patients had anaesthesia induced half an hour after premedication.
Figure 5 Time interval between I.M. premedication and induction of anaesthesia.

21% of adults going to theatre for an elective general surgical operative procedure had a preanaesthetic review (visit) done by the department of anaesthesia staff including consultant anaesthesiologists, anaesthesia residents from the University of Nairobi, and clinical officers in anaesthesia from the medical training college. 79% of patients went to theatre without a preanaesthetic review (visit) by the department of anaesthesia staff.

<table>
<thead>
<tr>
<th>Preanaesthetic review</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Done</td>
<td>14</td>
<td>19</td>
</tr>
<tr>
<td>Not done</td>
<td>61</td>
<td>81</td>
</tr>
</tbody>
</table>

Table 2 Preanaesthetic reviews done.
5 patients were hypertensive while 2 had ischaemic heart disease. Respiratory illness was represented by 2 of patients with asthma. 3 of the patients had renal failure while 2 were diabetics. 1 had hyperthyroidism, liver disease with jaundice and 1 had a psychiatric illness (schizophrenia) and was not on treatment.

<table>
<thead>
<tr>
<th>SYSTEMIC ILLNESS</th>
<th>NUMBER OF PATIENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>HYPERTENSION</td>
<td>5</td>
</tr>
<tr>
<td>ISCHAEMIC HEART DISEASE</td>
<td>2</td>
</tr>
<tr>
<td>ASTHMA</td>
<td>2</td>
</tr>
<tr>
<td>RENAL FAILURE</td>
<td>3</td>
</tr>
<tr>
<td>DIABETES</td>
<td>2</td>
</tr>
<tr>
<td>HYPERTHYROIDISM</td>
<td>1</td>
</tr>
<tr>
<td>PSYCHIATRIC ILLNESS</td>
<td>1</td>
</tr>
<tr>
<td>LIVER DISEASE</td>
<td>1</td>
</tr>
</tbody>
</table>

Table 3 Table of co-existent illnesses in patients reviewed.

All patients had the same type of premedication with intramuscular atropine and intramuscular pethidine. In addition, all patients regardless of weight had the same dose of these two drugs i.e. atropine 0.6 mg intramuscularly and pethidine 50 mg I.M. The intramuscular route was exclusively used in premedication.

Of the five hypertensive patients, one was on nifdefipine and lasix while another was on atenolol and lasix. Both patients had their antihypertensive
drugs discontinued on the morning of surgery without substitution. Three patients were not on any treatment for their hypertension. Three patients had renal insufficiency but were not on any renal replacement therapy.

Two patients were asthmatic and both were on salbutamol. Both patients had their bronchodilator therapy discontinued on the morning of surgery without substitution. Two patients were diabetics and both were on insulin. One had their regular dose of insulin in the morning of surgery while the other had it discontinued all together. Both patients were not the first patients on their respective theatre lists.

One patient was hyperthyroid on propranolol and carbimazole. Both drugs were omitted in the morning of surgery and atropine and pethidine given as premedication. Another patient was on antibiotics (Crystalline penicillin, gentamycin and flagyl). All antibiotics were omitted on the morning of surgery.
DISCUSSION.

The aim of premedication in anaesthesia is to allay anxiety, to reduce the magnitude and/or unwanted effect of disease, anaesthesia or surgery on the patient and to facilitate smooth running of the anaesthetic. Drugs commonly used include analgesics, anxiolytics, anticholinergics, antihistamines, antibiotics, anticoagulants, antiemetics, sedatives, among other drug classes.

Our findings show that most (72%) of patients undergoing adult elective general surgical procedures are below the age of 60 years while 28% of these patients are above the age of 60 years. This trend is likely to change and more elderly patients are now requiring surgical due to better health care ensuring that diseases common in the elderly can be managed medically. 37, 38, 39

Premedication in the elderly demands attention to detail as aging is associated with a progressive functional decline in all organ systems and this may become evident only during times of physiological stress such as illness, exercise or the perioperative period. The commonly used premedicant drugs such as atropine and pethidine have exaggerated effects in the elderly population and therefore applying a standardized premedication regime on all ages is inappropriate. 40

Atropine exacerbates bladder outlet obstruction in the elderly due to the prostatic hypertrophy which is evident in 50% of men aged over 60 years. 48
Pethidine causes more respiratory depression in the elderly population and this leads to delayed emergence from anaesthesia. 14

Abdominal surgery accounted for 54% of all elective adult surgical operations in the period of study. These operations are associated with a high incidence of pain both intraoperatively and postoperatively. This has been reduced by the trend towards laparoscopic procedures which involve much smaller incisions hence less pain.48

Careful premedication with analgesics can greatly ameliorate the pain of laparotomy. In our study, all patients had pethidine as analgesic premedication and this would go a long way in reducing the magnitude of post operative pain. Clinical trials and experimental data strongly suggest that preemptive analgesia is a clinically relevant phenomenon.40

Allergic reactions whether anaphylactic or anaphylactoid occur at a frequency of up to 1:1000 anaesthetics with a 5% mortality rate. 15% of the general population is allergic to some form of an allergen and this figure is rising.46 Neuromuscular blocking agents can cross react with foods, cosmetics, industrial chemicals and even disinfectants.41 Patients considered to be at high risk of allergic reactions should be premedicated with H1 and H2 receptor antagonists. None of the patients considered to be at risk of allergies in this study received these drugs. High dose steroids should also be considered.40,42.

Only 19% of adult elective general surgical patients reviewed in this study had a preanaesthetic review by staff from the department of anaesthesia. It
is the role of the anaesthetist as a perioperative physician to assess a patient, consult other medical specialties where necessary and aim to optimize the patient preoperatively. In this regard, the anaesthesiologist is the specialist most knowledgeable in evaluating and managing operative medical complexities as they relate to anaesthesia and surgery. In fact "the assessment of, consultation for, and preparation of patients for anaesthesia" is part of the American Board of Anesthesiology's definition of anaesthesia. ⁴⁰

One of the ways of ensuring that all patients going to theatre are assessed preoperatively would be to invest in a Preoperative and Preprocedure Assessment Clinic (PPAC). This would greatly decrease operative costs, improve the efficiency of clinic services, implement clinical pathways that educate and increase patient and surgeon satisfaction with perioperative and periprocedure services. ⁴³, ⁴⁴ A study at the University of Florida found that preanaesthetic evaluations changed care plans in 20% of patients. ⁴⁷ However there is a trend towards day case surgery and this will continue to reduce the number of elective surgical patients who get a preoperative review unless preprocedure and preoperative anaesthetic clinics are established locally.

Regarding the time interval between intramuscular premedication and induction of anaesthesia, 68% of patients got induction of anaesthesia more than two hours after premedication with atropine and pethidine. The half life of these drugs is about 2 hours which means that by the time these patients got to theatre, the effects of these drugs were wearing off. Patients need to
have induction of anaesthesia half an hour after intramuscular premedication with these drugs.\textsuperscript{45} 

Premedication with atropine causes a dry mouth and it is uncomfortable for the patient and also makes it difficult to speak well. The sedative, analgesic and anxiolytic properties of pethidine also reduce progressively as more time is wasted following intramuscular premedication. This reduces the desired property of premedicant pethidine as part of postoperative analgesia.

Premedication is administered in the surgical wards before they are taken to theatre by nursing staff who have to use transport mechanisms depending on the hospital to transport the patients. In Kenyatta National Hospital, this involves lifts which may contribute to delays as there are no lifts dedicated for the transport of theater bound patients. The delays are compounded by the fact that the receiving staff have to ensure that the patient is well prepared for surgery and that all investigations are in the file. Patients also have to have monitors attached to them once they are in the operating room and this also takes time. It may therefore be worth considering administering premedication at the receiving area as is practiced in some paediatric centers\textsuperscript{12}.

Atropine at 0.6 mg and pethidine at 50 mg both given intramuscularly appeared to be the primary choice of premedication for patients presenting for adult elective general surgical procedures at the Kenyatta National Hospital. Historically the opioid-anticholinergic combination is the most common and robust premedication regime.\textsuperscript{1} In other centres, the practice of the routine administration of atropine is dwindling away and its administration is reserved for cases that specifically require anticholinergic
effects for instance eye surgery, use of drugs that cause excessive salivation such as ketamine and awake fiberoptic intubation.\textsuperscript{23,45}

Pethidine on the other hand provides some desirable effects such as sedation, pre-emptive analgesia, smoothening of induction among others. The recommended dose for pethidine is 1 mg/kg given half an hour preoperatively. While all our patients got 50 mg of pethidine, it is highly unlikely that they all weighed 50 kg and some may have been overdosed and others underdosed. Patients need to be weighed and the recommended doses adhered to.

Another finding in this study was that patients with other chronic co-morbidities also had standard premedication prescriptions. Such premedication practice may precipitate dangerous drug interactions that would increase anaesthetic morbidity and indeed mortality. Unfortunately the data collected did not outline intra operative incidents in any of these patients. It would be worthwhile assessing any untoward effects of such practices.

If a drug is needed preoperatively for the treatment of a chronic illness, it should be continued through surgery. It must be specifically requested on prescriptions as most patients and nurses consider the nil by mouth directive to include drugs. Exceptions to this rule include Monoamine oxidase inhibitors, anticoagulants and fibrinolytic agents, nicotinic acid, dosage adjustments for insulin and corticosteroids, angiotensin converting enzyme inhibitors, and angiotensin II receptor blockers.\textsuperscript{40}
Most of the patients having preoperative drug therapy for one form of concurrent illness or the other had their medications discontinued on the morning of the operation. This is hazardous especially when dealing with drugs for asthma, hypertension, hyperthyroidism and diabetes mellitus. Varied recommendations on the alteration of long term treatment for patients in relation to anaesthesia, nil by mouth status, and acute illness are available and protocols locally must be provided.

Some patients in this study had long term comorbidity and chronic drug therapy. Our findings are of acute withdrawal with no restitution or alternative provision. It would be of interest to find out intraoperative effects of these therapeutic mishaps and an account appropriately given of further management.

All antihypertensive drugs should be continued until the morning of surgery except angiotensine converting enzyme inhibitors which are associated with in 100% of patients who take their antihypertensive medication in the morning of surgery. For patients on these drugs, intravenous preparations may be used after establishing hemodynamic stability in theatre. The antihypertensive drugs atenolol and nifedipine should not have been stopped on the morning of surgery.

Bronchospasm occurs intraoperatively especially in asthmatics and bronchodilator therapy should be continued on the morning of surgery. Two patients in our study had asthma and were on inhaled B₂ agonists which are recommended as they reduce steroid use and avoid adrenal suppression.
Their antiasthma drug was withheld on the morning of surgery putting them at an increased risk of bronchospasm intraoperatively.

Diabetics require a regime to ensure tight glycemic control and one such regime is the glucose - insulin or glucose potassium insulin regime. These regimes ensure that perioperative glucose control is optimized. One diabetic in our study had insulin discontinued on the morning of surgery while the other had their regular dose of insulin given. Protocols are needed in such cases to provide a measure of standardization even though it was not clear what education they had undergone due to restricted data collection in this study.

Elective surgery should not be undertaken on hyperthyroid patients without first rendering them euthyroid. One hyperthyroid patient in our study had their antithyroid medication discontinued on the morning of surgery. Antithyroid drugs should be administered on the morning of surgery to reduce the chances of an intraoperative thyroid storm which is very difficult to manage once it occurs. It is safer and probably easier to try and prevent it than treat it when it occurs.

The hyperthyroid patient was also on propranolol which reduces the tachycardia in hyperthyroidism among other beneficial effects. Atropine premedication was administered to this patient. This would put the patient at risk of a tachycardia which would increase myocardial oxygen demand causing myocardial ischaemia. Atropine should have been withheld in this patient to reduce the risks associated with tachycardia.
One patient was on antibiotics for an infection. These included crystalline penicillin, gentamycin and flagyl. All antibiotics were withheld. It is justifiable to withhold gentamycin due to its interaction with neuromuscular blocking agents leading to their potentiation. The other antibiotics should have been continued and a substitute for gentamycin introduced to reduce the risk of postoperative sepsis.
CONCLUSIONS.

1. The most commonly used drugs for premedication are atropine and pethidine and in a standard dose across the board.

2. 23% of adult elective general surgical patients have a chronic illness such as diabetes mellitus, hypertension, hyperthyroidism or asthma.

3. Premedication for elective adult general surgical patients in Kenyatta National Hospital is emperical without due regard to co morbidity.

4. Patients on concurrent drug therapy for their co-morbid illnesses get the same standard premedication as their healthy counterparts.

5. Premedication is almost exclusively given through the intramuscular route.
LIMITATIONS OF THE STUDY.

1. The study was limited to adult general surgical patients only. The results obtained cannot therefore be extrapolated to other surgical specialties.

2. The filing system was not chronological and therefore some files lacked continuity of patients’ case notes.

3. Some files lacked information as a result of misplacement of file pages.
RECOMMENDATIONS.

1. There should be well researched protocols to be used in the premedication of patients with some of the more common comorbidities.

2. There is a need for a preoperative clinic and due consideration should be given to the possible investment in one.

3. Alternative routes of premedication should be carefully considered and included in the protocols.

4. All patients should have a preoperative anaesthetic visit.
REFERENCES


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preoperative evaluation clinic in a teaching hospital.

Anesthesiology 85: 196 1996


47. Gibby GL, Gravenstein JS, Layon AJ, Jackson KI. How often does the preoperative interview change anaesthetic management?

Anesthesiology 77: A1134, 1992


Anesthesiology 1994; 81: 299
APPENDIX I

Data Capture Instrument

1. Patients characteristics

Age 18 – 30 □  31 – 60 □  > 60 □
Sex M □  F □
Operation ___________________________
Anaesthesia.

2. Systemic illnesses

CVS - Ischaemic Heart Dx □
       - Rheum Heart Disease □
       - Hypertension □
       - Other Specify □

RS - COPD □
     - Asthma □
     - Other □

Renal - ARF □
       - CRF □
       - Other □
3. Allergies (Atopy) - Specify

4. Prescriber - Anesthesia
- Surgery
- Other

5. Time interval between premedication and induction of anesthesia

- ½ Hr
- 1 Hr
- 2 Hrs
- > 2 Hrs
6. Was a preanaesthetic review done?

7. Route of administration

<table>
<thead>
<tr>
<th></th>
<th>Drug I</th>
<th>Drug II</th>
<th>Drug III</th>
<th>Drug IV</th>
</tr>
</thead>
<tbody>
<tr>
<td>IV</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IM</td>
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<td>PO</td>
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<tr>
<td>SC</td>
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</tbody>
</table>

Other

8. Other drugs patient was on pre-operatively. Were they included or omitted on the morning of surgery? (tick appropriately)

<table>
<thead>
<tr>
<th>Drug</th>
<th>Included</th>
<th>Omitted</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
I, Dr. Jimmie G. Kabugi MBChB (Nbi), a final year Anaesthesia registrar will give you the participant a full explanation of my intended study before you sign the consent form.

The Study

The study aims to document the conduct of premedication in Kenyatta National Hospital. There are medicines that are given to patients before surgery to facilitate anaesthesia. These medicines reduce the undesired effects of anaesthesia and/or concurrent diseases that a patient may have. It is the use of these drugs in Kenyatta National Hospital that I intend to study.

Confidentiality

Your identity will be protected at every stage of the study. Only codes will be used during reference to participants in the study.

Participation in the study

Your participation in the study will be voluntary and the decision to refuse to participate in or withdraw from the study at any time will not cause you to be denied any treatment.

No other invasive procedures or drug administration outside those necessary for the surgical procedure will be undertaken on the participants. Patients’ files will be consulted for data retrieval. This study shall be carried out at no extra cost to you. No complications are expected to occur as a result of your participation in the study.
APPENDIX III

Patient consent.

I .......................................................... of ..........................................................

Hereby consent to participate in the study of premedication as carried out at the Kenyatta National Hospital.

I am aware that the study does not entail the use of any invasive procedures or the use of drugs with unacceptable clinical effect. I also understand that in case I need to get in touch with the researcher, Dr. Jimmie G. Kabugi is available on Mobile Phone No 0722-790237.

I have the freedom to decline to participate in the study at any time.

Signed ........................................... Date ..................................

I confirm that I have explained to the patient the nature of the study.

Signed ........................................... Date ..................................

Kibali Cha Mgonjwa

Mimi ...................................................... kutoka ..................................................

Ninakubali kushiriki katika utafiti wa madawa yanayotumiwa kabla ya upasuaji.

Ninaelewa ya kwamba utafiti huu hauhusi kufaniyiwa kitu chochote mwilini au kupewa madawa yoyote. Ninaelewa ya kwamba ninaweza kumfikia mtafiti Dr. Jimmie G. Kabugi kwa nambari ya simu 0722-790237.

Niko na uhuru wa kujuzulu kutokana na utafiti huu wakati wowote.

Sahihi ...........................................Tarehe ...........................................

Ninathibitisha ya kwamba nimemueleza mgonjwa kikamilifu kuhusu utafiti huu.

Sahihi ...........................................Tarehe ...........................................