MINOR COMPLICATIONS

OF

ANAESTHESIA

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DECLARATION

This dissertation is my original work and has not, to my knowledge, been presented for master's degree in any other University.

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This dissertation has been submitted for examination with my approval as a University Supervisor.

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SUMMARY.

Minor complications of anaesthesia were studied in three hundred in-patients by interviewing them post-operatively. This was done to determine their incidence and relationship to age, sex and duration of anaesthesia.

Nausea and vomiting, contrary to common belief, was found to be more common in males than in females. Nausea was more frequent in eldery patients than young patients and vomiting was found to be more common in young than older patients. It was observed that the duration of anaesthesia had some correlation with these complications, though with modern anaesthetic agents like thiopentone, halothane, etc. the incidence of nausea and vomiting tends to be low.

Sore-throat, a common complication did not have much of sex difference but definitely the frequency increased with age and duration of anaesthesia. It's incidence was also higher in patients who had pharyngeal packs than those who had cuffed tubes, it was lowest in those who were on mask alone.

Muscle pains were commoner in female than in male patients. It was commonest in those patients who were between fourteen and forty years old.

The incidence of awareness was quite high in patients undergoing emergency caesarean section; these patients were poorly prepared and none of them had been given sedatives or narcotic drugs for pre-medication.

Trauma to teeth and gums occurred in a few patients. Post-operative headaches were more common in females than in males. Conjunctivitis, which occured in one patient, could be due to chemical irritation from anaesthetic vapours.

INTRODUCTION.

General anaesthesia was introduced into medicine around October, 1846 when Thomas Green Morton used diethyl ether for the first time in America. Since then, there has been a lot of changes; older drugs and techniques have been abandoned in favour of newer and perhaps safer ones. It is now becoming increasingly recognised particularly, in the last three decades or so, that some of these drugs and techniques are not without minor but undesireable effects; these have been studied fairly widely in many parts of the world. These minor complications of anaesthetic drugs and techniques may have no long-term effect on the overall health of the patient, but they are a constant concern to the patients and to the anaesthetists.

During the early days of anaesthesia, nausea and vomiting were quite common in the post-operative period, they were attributed to surgery. Editorial in 1960 (1) pointed out the significance of these minor complications and suggested that they may be reduced if the anaethetic is administered carefully.

Edmonds-seal et al in 1962 (2) did a pilot study of minor complications in patients by interviewing them and divided

the complications reported in three different catagories. They found that 47 per cent of their patients had at least one complaint. Fahy et al in 1969, (3) studied the incidence of minor complications in out-patients receiving general anaesthesia by sending them a questionaire (4), they reported an incidence of 44.9 percent. Brindle et al 1975 (5) also did a study on out-patients by sending them a questionaire within one week and four months of receiving anaesthesia. They studied the severity of each complication and duration it lasted; they found an incidence of 43 per cent. Smith et al in 1976 (6) reported an incidence of 77.9 percent in out-patients receiving general anaesthesia for dental treatment. Many other studies have been done by researchers.

Nausea and vomiting have been well known side effects of anaesthesia and indeed some patients do associate them with anaesthesia (7).

These have been a great problem to anaesthetists and remedies have been tried to reduce the incidence of nausea and vomiting. Atropine as pre-medication was thought to reduce the incidence of vomiting after chloroform anaesthesia. Anti-histamines have been used to reduce the incidence of vomiting; Knapp et al

in 1956 (7) reported incidence of 75 to 25 per cent which reduced to 45 to 13 per cent after the use of anti-histamines.

Burtles et al in 1957 (8) found the incidence of vomiting to be 28 per cent in their patients. Holmes in 1965 (9) reported an incidence of 35.6 per cent with diethyl ether and 39 per cent with other agents i.e. Halothane and Trichlorethyene.

Nausea and vomiting, which were common with diethyl ether and chloroform anaesthesia, have been reduced after the introduction of halothane and other inhalational anaesthetic agents. Thiopentone sodium as induction agent has also reduced the incidence of post-operative vomiting.

Various factors other than pre-medication, induction and maintenance agents can influence the incidence of post-operative vomiting, age of the patient appears to be important as children seem to be more prone to vomiting than adults; females appear to be more prone than males. In young feamles it is more common than in aged as was shown by Burtles et al in 1957 (8). In this study, female to male ratio was 2:1 in patients between 20 and 50 years and about 1.5:1 in patients over the age of 50 years. The site of operation may also influence the incidence of vomiting. Fisher

et al in 1984 (10) showed that the patients with previous history of post-operative vomiting tend to vomit more.

Sore-throat, ranging from mild irritation of throat to difficulty in speech along with painful swallowing, may be the result of intubation, whether blind or under direct vision. This may be due to the presence of the tube itself or bruising of the larynx with laryngoscope at the time of intubation. Contriburary factors to sore-throat may be trauma to tonsillar pillars, pharynx, tongue, larynx and drying of upper airway following anaesthesia by mask (11). In-tubation alone cannot be the sole cause of sore-throat post-operatively, this was shown by Loeser et al in 1980 (12). They found that 15 per cent of patients being maintained on mask developed sore-throat.

Wolfson in 1958 (13) reported an incidence of 21.3 per cent in females and 27.5 per cent in males. About 10.2 per cent of their non-intubated patients complained of sore-throat. Loeser et al in 1980 (12) reported an incidence of 25.9 per cent of their intubated patients.

Cuff on the endotracheal tube has been blamed for post-operative sore-throat, some cases of tracheal tissue necrosis, ulceration, granulomatosis and even death by rupture of cuff have been reported

(15). Loeser et al in 1980 (12) reported the incidence of post-operative Sore-throat as 90 per cent with plain tubes lubricated with 4 per cent lignocaine jelly; and 25 per cent with low volume cuffed tubes and no lubrication. Patel et al in 1983 (16) showed that diffusion of nitrous oxide occurs into the cuffs inflated with air and this is proportional to the duration of anaesthesia.

Muscle pains and aches have been observed since the introduction of succinyl choline (suxamethonium) in 1951. Many researchers have been doing studies to find an antidote to prevent the pain, or at least to modify the severity of the pain. Despite all what has been done, this still remains to problem to some patients.

Post-suxamethonium pains were first reported by Bourne et al in 1952 (17) and were fully described and their incidence determined by Churchill-Davidson in 1954 (18). Waters et al in 1971 (19) hypothesised the cause of muscle-pains after the use of suxamethonium, they said it was probably the result of unsynchronised muscle contractions, which causes shearing of connective tissue between the muscle fibres. Muscle pains appear to be influenced by age, sex and physical fitness. They are commoner between 14 and 50 years of age (20), commoner in females

than in males (21) and they are less frequent in muscularly fit than in unfit patient (22). Waters et al in 1971 (19) suggested that muscle pains are less frequent when suxamethonium is injected rapidly.

Incidence of muscle pains varies in different parts of the world. Churchill-Davidson in 1954 (18) reported an incidence of 66 per cent in out-patients and 14 per cent in in-patients. Hegarty in 1956 (23) reported and incidence of 20 per cent. Morrice et al in 1957 (24) found it in 72 per cent. Edmonds-seal et al in 1962 (2) reported it to be 0.7 per cent, Brindle et al in 1975 (5) reported it to be 43 per cent and Nzioki in 1984 (25) reported an incidence of 40 per cent in out-patients receiving general anaesthesia.

It has been known over the last few years that light anaesthesia may lead to the problem of awareness. Incidence of awareness increased with introduction of long-acting muscle-relaxants and popularisation of controlled pulmonary ventilation. The overall incidence of awareness depends upon the type of surgery and anaesthetic techniques. The incidence of awareness may also be influenced by drugs used in pre-medication and whether adjuvants have been added or not. Standard doses of anaesthetic drugs cannot be relied upon at all times to prevent awareness, as some patients

may be more resistant than others, due to their individual variation in response to drugs. Timing is also important, even with adequate doses, the patient may remember intubation if this occurs before the induction agent has taken effect. The patient may also be aware if the effect of induction agent has waned off before the maintenance anaesthetic agents have reached an adequate tension in the brain.

Recently it has been suggested that many patients receiving light anaesthesia in combination with muscle-relaxants may be aware during the surgery but have no recollection later on (26). This may be due to amnesia produced by anaesthetic agents or sleep itself. In cases of awareness, retention of vision appears to be unusual. Sometimes patients may hear but may not feel pain as the effect of nitrous oxide as an analgesic may not be adequate in early the stages of anaesthesia, because of it's dilution with air present in the circuit used.

Winterbottom in 1950 (27) was the first person to report awareness. Since then numerous articles on this subject have appeared, in most cases it has been reported to be between 0 and 7 per cent. Moir in 1970 (28) reported on incidence of 0 per cent and Brice et al in 1970 (29) reported it to be 7 per cent, Crawford in 1971 (30) found

an incidence of 2.5 to 4 per cent, when 67 per cent of nitrous oxide was used, Mckenna in 1973 (31) reported an incidence of 2 per cent after endotracheal intubation. Wilson et al in 1975 (32) reported 1 per cent and Famweo in 1976 (33) found an incidence of 4 per cent in obstetric cases. Levinsion in 1965 (34) found an incidence of 40 per cent under hypnosis.

Clinical manifestations of light anasthesia, when muscle-relaxants are used, are well known. Tachycardia, hypertension, sweating and pallor in response to surgical stimulus are all associated with this state. Many anaesthetists have tried to investigate the method to detect, when the patient is light enough to be aware of surroundings or feel pain, supposedly under the effect of anaesthesia. Tunstall in 1977 (35) using" Isolated forearm technique" made verbal contact with the patient and obtained response to command. Cormack in 1978 (36) assessed the speed of recovery after anaesthesia and from this he made presumptive evidence that the patient might have been aware. These methods were indirect and inaccurate. Some anaesthestists have tried using electro-encephalography and cerebral function monitoring as an objective method of assessing anaesthetic depth to study awareness, but this again is not fool-proof.

Teeth are commonly damaged during laryngoscopy and intubation, use of oropharyngeal airways and incorrect use of mouth gags etc. The risk of dental trauma increases in presence of dental disease, at extremes of age and with faulty techniques (37) very few authors have written or mentioned about trauma to teeth and gums Edmonds-seal in 1962 (2) reported an incidence of 1.2 per cent.

Ocular complications can be caused by direct trauma to eyes, drying of cornea or irritation of conjunctiva by vapours of anaesthetic agents leaking through the gap between mask and face, when an ill-fitting mask is used. Snow et al in 1975 (38) reported two cases of corneal abrasion as complications of anaesthesia with the use of long-acting muscle-relaxants.

Headaches have been quite common as reported by various researchers (2,3,5,6). Tyrell et al in 1968 (39) reported headaches in 60 per cent of their patients on nitrous oxide-oxygen and halothane, breathing spontaneously and 44 per cent in patients being ventilated artificially but only 12 per cent when halothane was omitted. They suggested that females were more prone to headaches than males.

Edmonds-seal et al in 1962 (2) reported headaches in 2.7 per cent of their patients. Fahy et al in 1969 (3) reported an incidence

of 35 per cent, Brindle et al in 1975 (5) reported it to be 17 per cent and Smith et al 1976 (6) found it in 81 per cent. The reason for the discrepancies was probably due to the differences of methods of eliciting and duration between anaesthesia and the interview. Mc Dowell et al in 1970 (40 found that the effect of anaesthesia and surgery were not important in influencing the incidence of headaches.

Polyethylene glycol, the solvent used to dissolve diazepam is known to be irritant and to cause phlehothrombosis if used in small veins or in shocked patients. It is therefore advisable to use large fast-flowing veins to inject diazepam. Extravasation of anaesthetic drugs could damage adjacent structures. Denison-Davis in 1966 (41) reported 5 cases of nerve and muscle damage and 10 cases of local tissue necrosis with use of thiopentone. Vene-puncture, itself may damage neighbouring structures as reported by Berry et al in 1977 (42). The incidence found by these workers was about 1:25000 vene-punctures.

Incomplete reversal can either be due to excessive doses of muscle relaxants, or perhaps due to attempting to reverse too soon after administering the muscle relaxants. Other factors may be electrolyte imbalance, hypothermia, acidosis or hypovolaemia.

Unexpected long action of muscle relaxants may be due to associated diseased such as myasthenia gravis or myasthenic syndrome.

AIMS AND OBJECTIVES

This study was undertaken to determine the incidence of various minor complications of anaesthesia and their relationship to age, sex and duration of anaesthesia, at Kenyatta National Hospital. This has not been done before at this hospital.

MATERIALS AND METHODS.

Three hundred patients (ASA Class I & II) were studied. All these patients had received general anaesthesia. The patients studied were undergoing surgical, gynaecological, orthopaedic and obstetric procedures (TABLE I). Patients undergoing E.N.T., Ophthalmological, neurosurgical, cardio-thoracic and dental procedures were not included in this study. All these patient were interviewed between twenty four and thirty six hours after operation. They were anaesthetised by different anaesthestists to eliminate the bias of being extra careful in technique as suggested by Utting in 1981 (26).

Patients studied were between 14 and 75 years of age. The mean age of these patients was 32.5 ± 4.5years. There were 138 (46 per cent) males and 162 (54 per cent) females, the mean age for males was 36.8 ± 7.4 years and The mean age for females was 28.4 ± 8.7 years.

Pre-medication of atropine 0.6 mg with or without pethidine was given intramusclarly half an hour before coming to threatre. The dose of pethidine varied from 25 mg to 100 mg, in those who received it.

In most cases a sleeping dose of thiopentone sodium was used for induction, though in few cases (9 patients) diazepam 10 to 20 mg was

used. Suxamethonium was used for intubation in doses of one miligramme per kilogramme (1mg/kg) body weight, though in some cases long-acting muscle-relaxants were used for intubation.

A long-acting muscle relaxant was used when and where required, intermittent suxamethonium was not used. In most cases d-tubocurarine was used except in a few cases where pancuronium bromide or gallamine triethiodide were used.

Magill's circuit (Mapleson type A) was used in all patients who did not require artificial ventilation. The closed circuit with carbon dioxide-absorber was used in all patients who required artificial ventilation.

During operation, the pulse and blood pressure were checked quarter-hourly and any infusion fluid given was recorded carefully; drugs given during operation were also recorded.

At the end of operation, time was recorded when anaestheti c drugs were stopped. Those who had received long-acting muscle relaxant drugs were reversed with atropine 1.2 mg and neostigmine 2.5 mg intravenously. Thus the duration of anasthesia was calculated.

Between twenty four and thirty six hours after the operation the patients were visited and interviewed, starting with general talks. The patient was given a chance to volunteer any complaint of anaesthesia and recovery. Although, it was difficult to get any complaint from a satisfied patient who did not have any idea of how they are expected to feel,following their experience of anaesthesia. Then the patients were asked about specific complaints. (APPENDIX I), The idea of a questionnaire was taken from the questionnaire used by Fahy et al in 1969 (4).

Anaesthetists' and nurses' notes were studied for any trauma to teeth and gums, incomplete reversal and vomiting during anaesthesia, immediately after anaesthesia or when the patient was drowsy and could not remember any thing. These notes were also checked for drugs given to control vomiting, if any.

All these findings were recorded in an answer sheet (APPENDIX II), complications were categorised on basis of severity of symptoms. Muscle-pains were categorised as done by Conway et al in 1960 (14) though, they divided their complaints as mild and severe only. Trauma to teeth and gums, headaches, ocular complications vascular complications and incomplete reversal were recorded as they happened, by checking anaesthetists, nurses' notes and asking the patients.

RESULTS.

Out of three hundred patients interviewed 162 (54 per cent) were females and 138 (46 per cent) were males (TABLE 2), giving a ratio of 1.2:1. The biggest number of patient 139 (46.3 per cent) fell in age group 21 to 30 years and next biggest group was between 31 and 40 years of age. This shows that 197 (65.7 per cent) patients were between 21 and 40 years of age.

160 (53.3 per cent) patients had at least one complaint. Out of these 66 were males and 94 were females. Out of these 74 (24.7 per cent of total) patients had more than one complaint.

A total of 138 (46 per cent) patients received atropine 0.6 mg alone as premedication and 162 (54 per cent) patients received varying doses of pethidine along with atropine for premedication (TABLE 3).

A total of 47 (15.7 per cent) patients complained of nausea, out of which 25 were males and 22 females (TABLE 4), 36 patient complained of mild nausea and 11 patients had moderate nausea (TABLE 5A, 5B). The biggest age group suffering from this condition were of 31 to 40 years, although, 2 patients were from age group 71 & 75 years,(TABLE 6). The largest group of sufferers were under anaesthesia for 61 to 70 minutes,

(TABLE 7) , similarly 66.7 per cent patients were under anaesthesia between 131 to 140 minutes and 50 per cent patients were under anaesthesia for more than 140 minutes. This indicates that the duration of anaesthesia had some influence on presentation of this complaint. 17.9 per cent patients who received pethidine along with atropine experienced nausea, while only 13.0 per cent patients who received atropine alone complained of it, (TABLE 8).

Only 7 (2.3 per cent) patients had vomited post-operatively. There were 4 male patients and 3 female patients, (TABLE 4). 5 patients had mild and 2 patient had moderate vomiting (TABLE 5A, 5B), 5 patients were of age between 14 and 30 years (TABLE 6) 2 patients were under anaesthesia for 31 to 40 minutes and the others were under anaesthesia for 41-50, 51-60, 61-70, 71-80, and 81-90 minutes respectively (TABLE 7). 2.5 per cent patients who received pethidine vomited while only 2.2 per cent vomited, who received atropine alone (TABLE 8).

A total of 127 (42.3 per cent) patients complained of sore-throat Out of these 54 were males and 73 were females (TABLE 4). 100 patients had mild sorethorat, 24 patients had moderate sorethroat and 3 patients complained of severe sorethorat, (TABLE 5A, 5B) 53 patients complaining

of sorethroat belonged to 21-30 years age group (TABLE 6) and the biggest number of patients complaining of sorethroat were under anaesthesia tube and pharyngeal pack complained of sorethroat, while none of the 11 patients maintained with mask alone complained of sorethroat, (TABLE 9). About 44.9 per cent patients who received atropine alone complained of sorethroat while 40.1 per cent of patient who received pethidine complained of it (TABLE 8).

Post-suxamethonium muscle-pains were reported by 45(15 per-cent) patients, females had higher incidence than males (TABLE 4). The biggest group of 25 patient complaining of aches and pains was in age group 21-30 years (TABLE 6) 8.6 percent patients who received pethidine complained of muscle pains (TABLE 8).

Fifteen patients complained of awareness and all these patients were females (TABLE 4). The age and duration of anaesthesia did not appear to have much influence on this complication (TABLE 6,7).

Only 3(1 percent) patients complained of headaches. All were females. Their ages were 30 years, 33 years and 38 years respectively. All these patients could also recall one or other incidence during anaesthesia.

The 3(1 percent) patients having vascular complications, complained of pain along the vein of injection. One patient had a thrombosed vein and the other two had frank thrombophlebitis. The patients were 21, 25 and 70 years of age respectively. In all these cases diazepam was used for induction.

One patient had redness of the eye and in this patient a mask with an oropharyngeal airway was used to maintain anaesthesia.

Two patients required a repeat dose of atropine 1.2 mg and neostigmine 2.5 mg (reversal drugs). Both patients were obese and d-tubocurarine 45 mg was used for relaxation. One of them was a male and the other one was female, the duration of anaesthesia was 55 minutes and 45 minutes respectively.

DISCUSSION.

Previous studies done on this subject (2, 3, 5, 6, 43) had varying results ranging from 43 to 80 percent. In this study of three hundred in-patients undergoing surgery under general anaesthesia, 160 (53.3 percent) patients had at least one complication. This incidence was nearer though less than the incidence reported by Ogg in 1972 (43) of 61 percent. Out of all these studies (2, 3, 5, 6, 43) only Edmonds seal et al 1962 (2) did study on in-patients by interviewing them; while others (3, 5, 6, 43) did study on out patients receiving general anaesthesia. Findings of 53.3 percent was higher than that reported by Edmonds seal et al in 1962 (2) of 47 percent. The difference of these findings may be due to difference in methods of obtaining information from the patients. Fahy et al in 1969 (3) reported an incidence of 44.9 percent, Brindle et al (5) reported an incidence of 43 percent and Smith et al (6) found an incidence of 77.9 percent of their patients having at least one complication.

The duration of anaesthesia did have some effect on post-anaesthetic complications. The incidence increased with increasing duration of anaesthesia. The findings of Fahy et al in 1969 (3) were similar.

Nausea occurred in 47 (15.7 percent) patients, which was nearer to the incidence reported by Brindle et al in 1975 (5) of 15.5 percent. A lower incidence of 11.8 percent was reported by Fahy et al in 1969 (3). A very high incidence of 47.4 percent has been reported by Smith et al in 1976 (6). Male patients in this study were affected more than females (TABLE 4). The reason for this might be that about 94.2 per cent male patients received pethidine along with atropine for premedication while only 19.8 percent female patients received pethidine (TABLE 3) and pethidine is known to increase the incidence of post-operative nausea. About 17.9 percent patients who received pethidine complained of nausea while only 13.0 percent patients who did not receive pethidine complained of it, (TABLE 8). It was observed that nausea was more common in older age groups (TABLE 6). The incidence of nausea was noted to be increasing with the duration of anaesthesia, this was also observed by Fahy et al in 1969 (3) that higher percentage of patients receiving anaesthesia for longer periods were affected by nausea.

Vomiting occurred in 7(2.3 percent) patients. This incidence was nearer to the incidence reported by Fahy et al in 1969 (3) of 3.9 percent in their study. Much higher incidence have been reported by Edmonds-seal et al (2) of 14.2 percent. The reason for low

incidence of vomiting in this study might be that all of these patients received atropine for premedication, which is known to reduce the incidence of vomiting.

Thiopentone sodium which was used for induction in most of these patients is also known to reduce the incidence of vomiting. Use of halothane as an adjuvant to nitrous oxide and oxygen might have had some effect on the incidence of vomiting.

Out of 7 patients who reported vomiting, 4(2.9 percent) were male patients and 3(1.9 percent) were female patients (TABLE 4), which was contrary to the findings of other researchers. Burtles et al in 1957 (8) showed that it was more common in females than in males, and gave the ratio of 2:1 under the age of 50 years and 1.5:1 in patients over the age of 50 years. Narcotic analgesis are known to increase the incidence of vomiting post-operatively, 130(94.2 percent) male patients received pethidine as premedication in varying doses along with atropine while only 32(19.8 percent) female patients received pethidine. (TABLE 3). This might have been the cause of higher incidence of vomiting in males in comparison to females. In this study, the patients who received pethidine along with atropine for

for premedication had higher incidence of vomiting than those who received atropine alone (TABLE 8). The higher incidence of vomiting was found in patient of 21-30 years of age. All the patients reporting vomiting were less than 50 years old (TABLE 6), comparing well with other studies that younger patients are more prone to vomiting than older patients. The duration of anaesthesia did not have much effect on incidence of vomiting (TABLE 7), this was contrary to the observation of Fahy et al (3).

Sore-throat was the commonest complaint in this study. It was reported by 127 (42.3 percent) patients. This was nearer to the findings of Wylie in 1950 (44) who reported it in 46 percent of his patients. Loeser et al in 1980 (12) reported an incidence of 40 percent with uncuffed tubes and 46 percent with cuffed tubes. The incidence of 42.3 per cent found in this study was much higher than that reported by Wolfson in 1958 (13) of 21.3 percent. Conway et al in 1960 (14) reported it in 24.5 percent, Edmonds-seal et al in 1962 (2) of 14 percent, Brindle et al in 1975 (5) of 28.2 percent. Smith et al in 1980 (12) reported it to be 90 percent with uncuffed tubes lubricated with 4 percent lignocaine jelly.

The incidence of sorethroat was slightly higher in females than in males (TABLE 4). Only 3 patients complained of severe sorethroat and all were females (TABLE 5A, 5B) Wolfson in 1958 (13) and Hartsell et al in 1964 (45) reported similar observations that females are more liable to complain of sorethroat than males. The other cause of this low incidence in males might have been because of the use of pethidine as premedication along with atropine, firstly it raises the pain threshhold, because of it's analgesic action and secondly, pethidine reduces the laryngeal reflexes, so the friction of cords over the tube might have been reduced, leading to less trauma to vocal cords and thus less incidence of sorethroat in males. It was interesting to note that the incidence of sorethroat increased with increasing age, (TABLE 6). The duration of anaesthesia had some influence on the incidence of sorethroat (TABLE 7, 10). It appeared to be increasing with the duration of anaesthesia which was contrary to the finding of Conway et al in 1960 (14). The incidence of duration might be because of the increase in pressure and volume of air in the cuff, due to diffusion of nitrous oxide into the cuff as suggested by Patel et al in 1983 (16).

The type of airway used to maintain anaesthesia definitely had some influence on sore-throat. In this study 63.6 percent of patients on whom an endotracheal tube with wet pharyngeal pack was used developed sorethroat (TABLE 9), similarly an incidence of 80 percent was reported by Smith et al in 1976 (6), they had used gauze soaked in paraffin to pack the throat. Conway et al (14) reported an incidence of 50 percent with non-cuffed tubes, patients maintained on mask alone did not complain of any sorethroat, while 23.3 percent patients on whom mask with an oropharyngeal airway was used, to complained of sorethroat. An incidence of 15 percent was reported by Loeser et al in 1980 (12). Conway et al in 1960 (14) reported an incidence of 10 percent in non-intubated patients. This might have been due to trauma to pharynx and or tonsillar pillars by an airway.

Muscle pains were reported by 45 (15 percent) patients, which was nearer to the incidence of 14 percent reported in in-patients by Churchill-Davidson in 1954 (18). Other researchers (2, 5, 6, 23, 46) have reported varying results ranging from 0.7 percent to 49 percent. Although, Smith et al in 1976 (6) reported muscle pains in 27.4 percent of their patients, they did not use suxamethonium in their study.

Muscle pains were commoner in females than in males, 34 (21 percent) of females and 11 (8 percent) of males complained of muscle pains (TABLE 4). These incidences compared well with the studies of Hegarty in 1956 (23) and Burtles et al in 1961 (46). Muscle pains were also common in patients of 14 to 50 years of age group, similar to the incidence observed by Craig in 1964 (20).

Muscle pains appeared to be dose-related (TABLE 11). It was observed that 38.3 percent of the patients receiving 100 mg of suxamethonium complained of muscle pains, while only 15 percent of the patients receiving 80 mg of suxamethanium complained of pains. None of the patients receiving 50 and 60 mg suxamethonium complained of muscle pains.

One patient who did not receive suxamethonium complained of muscle pains perhaps because she developed halothane shakes post-operatively.

Awareness in this study was included as minor complication, although at times it can be a nightmare and may affect the patient for a long time. This was seen in a case, where patient described her ordeal under anaesthesia (47). It was found in 15(5 percent)

patients in this study, which was nearer to the incidence reported by Browne in 1973 (48) of 5.3 percent. A Higher incidence of 7 percent was reported by Brice et al in 1970 (29). Many other researchers (28,31,32) have reported incidence of 0-4 percent in various studies. All the patients complaining of awareness in this study were females, similar observations were made by Wilson et al in 1975 (31).

All the patients complaining of awareness in this study were undergoing obstetric procedures and they were all given atropine 0.6 mg alone as premedication. A standard dose of thiopentone sodium of 250 mg (2.5 percent solution) was used for induction, intubation was done under suxamethonium, varying from 50 to 100 mg These patients were maintained by manual ventilation using 50 percent nitrous oxide in oxygen, supplemented with 0.5 percent halothane, d-tubocurarine was given when the effect of suxamethonium was over. Nitrous oxide and halothane was switched off at the end of operation. Atropine 1.2 mg and neostigmine 2.5 mg were used to reverse the effect of d-tubocurarine. Moir in 1970 (28) suggested that inclusion of 0.5 percent halothane with nitrous oxide and oxygen reduces the

incidence of awareness, but still it was observed in 5 percent patients in this study. This might have been due to individual variation in response to standard dose of anaesthetic drugs and agents. Breckenridge et al in 1983 (49) suggested that even after eliminating cases of avoidable awareness due to problems with techniques, there remains a group of patients who can recall even after apparently adequate anaesthesia.

A total of 9 patients had actual recall of intubation (mouth being opened and something long being put in). Out of these, 4 patients also remembered sharp cutting pain in lower half of the body. 6 other patients could recall hearing the baby crying, they wanted to move and pick the baby but could not do so. None of the patients had visual awareness. Most of the recall observed was of about first 5 to 10 minutes of anaesthesia. The reason might have been that the effect of thiopentone sodium had waned off and concentration of anaesthetic agents was not enough to make effect on brain upto that time, as suggested by Waters in 1968 (50) that the closed circuit requires some time to acquire adequate concentration of anaesthetic agents. This might be due to the dilution of anaesthetic agents by air in the circuit used.

The use of pethidine for premedication in 94.2 percent male patients might have been the reason for lack of awareness in males. Waters in 1968 (50) suggested that the patient may be very light if light premedication is used and some time should be taken before surgery is started, to make sure that the level of unconsciousness has been achieved. Similarly, the female patients, who had been receiving diazepam for sedation pre-operatively, did not have recall of events, while under anaesthesia.

All the patient having recall were between 14 and 40 years of age. Same was reported by Wilson et al in 1975 (31), that patients reporting awareness belonged to age between 26 - 48 years. The duration of anaesthesia did not appear to have much effect on the incidence of awareness (TABLE 7), as was reported by Wilson et al in 1975 (31).

Trauma to teeth and gums occurred in 4 patients. Out of these two had bleeding gums and in two patients there was damage to teeth. In one patient an upper incisor tooth got subluxated and the other patient had caries of an upper incisor, which cracked longtudinally during intubation and had to be extracted at the end of operation as

one half got dislodged, carious teeth and single upper incisors are risky as suggested by Wright et al in 1974 (36). Both cases of dental trauma were females and were 35 years and 65 years of age respectively. The incidence of 1.2 percent is reported by Edmonds-seal et al in 1962 (2).

Trauma to gums occurred during intubation,by laryngoscope as both the cases were difficult to intubate due to short muscular neck.

Headaches were reported by 3(1 percent) patients. It compares well with the incidence of 1.7 percent reported by Edmonds-seal et al in 1962 (2). Higher incidence of headaches have been reported by Fahy et al in 1969 (3) of 37 percent. Tyrell et al in 1968 (39) of 17 percent and Smith et al in 1976 (6) reported it in 81 percent. These differences may be due to differences in ways of asking questions, or may be due to differences in techniques.

All the three patients reporting headaches were females. Tyrell et al in 1968 (39) showed that females were more prone to headaches than males. Another interesting observation made in this study was that all three patients were also aware of one or another incidence

during anaesthesia. These patients were 30, 33 and 38 years old. In all cases headaches started about 6-8 hours after the end of surgery and lasted for about 8 hours. No medication was given for headaches as it was not severe.

Vascular complications were observed in 3(1 per cent) patients. All these patients were given diazepam for induction and maintained with mask and orpharngeal airway, the duration of anaesthesia was 40, 55 and 85 minutes, their ages were 21, 55 and 70 years respectively.

All the patients were male and were undergoing orthopaedic procedures. The reason for these complications most likely was due to irritation of venous intima by polyethylene glycol, the solvent of diazepam, which is known to cause phlebothrombosis. The incidence of 1 per cent was nearer and similar to the incidence of 1.2 per cent reported by Edmonds-seal in 1962 (2), although there is no evidence of them using diazepam on their patients.

Only one patient was observed to be having conjuctivitis after anaesthesia. This was probably due to to irritant effect of anaesthetic vapurs. This is a rare complication and very little has been written about it. Two cases of corneal abrasion have been reported by Snow et al in 197

Only two patients in this study, needed to be given a repeat dose of reversal drugs. Electrolyte imbalance, hypothermia, hypovolaemia and acidosis were not found in these patients, requiring a repeat dose.

Judging from the studies done elsewhere the incidence of most of the minor complications appear to be higher in out-patients than in in-patients. Perhaps early mobilization has some effect on the incidence, although, only one study (2) of minor complications in in-patients has been published so far.

CONCLUSION

Minor complications of anaesthesia were studied in three hundred in-patients presenting for surgery at Kenyatta National Hospital. It was found that about fifty three per cent patients developed at least one complaint. This was higher than that reported in other studies done elsewhere. Female patients appeared to be more prone to developing complications than male patients. It is concluded that that the inclusion of a hypnotic or a narcotic drug, along with atropine during premedication will reduce many of these minor complications.

TABLE 1.

SEX DISTRIBUTION OF SURGICAL PROCEDURES

SURGICAL PROCEDURE / SEX	NO (77)	MALE	FEMALE
GENERAL SURGICAL	97	79	18
ORTHOPAEDIC	65	59	6
OBSTETRIC	122		122
GYNAECOLOGICAL	16		16
TOTAL	300	138	162

TABLE 2.

AGE AND SEX DISTRIBUTION OF PATIENTS.

SEX / AGE (IN YEARS)	NO (77)	14-20	21-30	31-40	41-50	51-60	61-70	71-80
MALE	138	15	50	21	17	19	12	4
FEMALE	162	26	89	37	6	3	1	-

TABLE 3.

SEX DISTRIBUTION OF PREMEDICATION DRUGS.

PREMEDICATION DRUGS SEX	NO (77)	MALE	FEMALE
ATROPINE 0.6 mg	138	8(5.8*)	13(94.2)
ATROPINE 0.6 mg + PETHIDINE 25 mg	1	1(100)	-
ATROPINE 0.6mg + PETHIDINE 50 mg	141	111(78.7)	30(21.3)
ATROPINE 0.6 mg+ PETHIDINE 75 mg	1	1(100)	-
ATROPINE 0.6 mg + PETHIDINE 100 mg	19	17(89.5)	2(10.5)

*FIGURES IN BRACKETS ARE PERCENTAGES IN PARENTHESIS.

TABLE 4.

SEX DISTRIBUTION OF COMPLICATIONS.

COMPLICATIONS / SEX	NO (77)	NAUSEA	VOMITING	SORETHROAT	MUSCLE-PAINS
MALE	138	25 (18.2)	4 (2.9)	54 (39.1)	11 (8.0)
FEMALE	162	22 (13.6)	3 (1.85)	73 (45.06)	34 (21.0)

TABLE 5A

COMPLICATIONS AND THEIR SEVERITY.

SEVERITY / COMPLICATIONS	MILD	MODERATE	SEVERE	NO COMPLAINTS
NAUSEA	36	11	-	253
VOMITING	5	2	-	293
SORETHROAT	100	24	3	179
MUSCLE PAINS	34	10	1	255
AWARENESS	11	4	-	285

TABLE 5B

SEVERITY OF COMPLICATIONS DISTRIBUTED ACCORDING TO SEX.

SEVERITY / COMPLICATIONS	MILD		MODERATE		SEVERE		NO COMPLAINTS	
	MALE	FEMALE	MALE	FEMALE	MALE	FEMALE	MALE	FEMALE
NAUSEA	21	15	4	7	-	-	113	140
VOMITING	4	1	-	2	-	-	134	159
SORETHROAT	41	59	13	11	-	3	84	89
MUSCLE PAINS	8	26	3	7	-	1	127	128
AWARENESS	_	11	-	4	-	-	138	147

TABLE 6.

AGE DISTRIBUTION OF COMPLICATIONS.

COMPLICATIONS / AGE(IN YEARS)	NO (77)	NAUSEA	VOMITING	SORETHROAT	MUSCLE PAINS	AWARENESS
14-20	41	4(9.8)	1(2.4)	11(26.8)	7(17.1)	3(7.3)
21-30	139	10(7.2)	4(2.9)	53(38.1)	25(18)	6(4.3)
31-40	58	17(29.3)	1(1.7)	32(55.1)	6(10.3)	6(10.3)
41-50	23	7(30.4)	1(4.3)	9(39.1)	4(17.4)	-
51-60	22	5(22.7)	-	11(50)	1(4.5)	-
61-70	13	2(15.38)	-	7(53.8)	2(15.4)	-
71-75	4	2(50)	-	4(100)	-	-

TABLE 7.

COMPLICATIONS IN RELATION TO DURATION OF ANAESTHESIA.

COMPLICATIONS / DURATION IN MINUTES	NO (77)	NAUSEA	VOMITING	SORETHROAT	AWARENESS
21-30	22	2(9.1)	-	7(31.8)	-
31-40	45	3(6.7)	2(4.4)	15(33.3)	3(6.7)
41-40	57	6(10.6)	1(1.8)	25(43.9)	5(8.7)
51-60	57	7(12.3)	1(1.8)	17(29.8)	4(7.0)
61-70	36	10(27.8)	1(2.8)	15(41.7)	-
71-80	27	8(29.6)	1(3.7)	17(63)	2(7.4)
81-90	18	3(16.7)	-	11(61.1)	1(5.6)
91-100	13	2(15.5)	1(7.7)	6(46.2)	-
101-110	10	-	-	4(40)	-
111-120	5	1(20)	-	3(60)	-
121-130	1	-	-	1(100)	-
131-140	3	2(66.7)	-	1(33.3)	-
= 140	6	3(50)	-	5(83.3)	-

TABLE 8.

COMPLICATIONS IN RELATION TO PREMEDICATION

COMPLICATIONS / PREMEDICATION	NO (77)	NAUSEA	VOMITING	SORETHROAT	MUSCLE PAINS	AWARENESS
ATROPINE 0.6 mg	138	18(13)	3(2.2)	62(44.9)	31(22.5)	15(10.9)
ATROPINE 0.6 mg+ PETHIDINE 25 mg	1	-	-	-	-	-
ATROPINE 0.6 mg+ PETHIDINE 50 mg	141	23(16.3)	4(2.5)	56(39.7)	11(7.8)	-
ATROPINE 0.6 mg+ PETHIDINE 75 mg	1	-	-	-	-	-
ATROPINE 0.6 mg+ PETHIDINE 100mg	19	6(31.6)	-	9(47.4)	3(15.8)	-

TABLE 9.

SORETHROAT IN RELATION TO AIRWAY

SORETHROAT / AIRWAY	NO (77)	MILD	MODERATE	SEVERE	NO COMPLAINTS
TUBE & CUFF	202	74(36.6)	14(6.9)	1(0.5)	113(55.9)
TUBE & PACK	44	17(38.6)	9(20.4)	2(4.5)	16(36.4)
MASK & AIRWAY	43	9(20.9)	1(2.3)	-	33(76.7)
MASK	11	-	-	-	11(100)

TABLE 10:

SORETHROAT IN RELATION TO DURATION OF ANAESTHESIA.

SORETHROAT / DURATION (IN MINUTES)	NO (77)	MILD	MODERATE	SEVERE	NO COMPLAINT
LESS THAN 30	22	4(18.2)	3(13.6)	-	15(68.2)
31-60	159	51(32.1)	5(3.1)	1(0.6)	102(64.2)
61-90	81	32(39.5)	10(12.3)	-	39(48.1)
91-120	28	11(39.3)	2(7.1)	-	15(53.6)
MORE THAN 120	10	4(40)	2(20)	2(20)	2(20)

TABLE 11.

MUSCLE PAINS IN RELATION TO DOSE OF SUXAMETHONIUM.

MUSCLE PAINS / DOSE OF SUXAMETHONIUM	NO (77)	MILD	MODERATE	SEVERE	TOTAL NO. AFFECTED.
50 mg	43	-	-	-	-
60 mg	9	-	-	-	-
70 mg	8	1(12.5)	-	-	1(12.5)
80 mg	20	3(15)	-	-	3(15)
100 mg	103	30(29.1)	9(8.7)	1(1.0)	40(38.8)

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QUESTIONNAIRE:

1. Did you have any nausea?
2. Did you Vomit +
3. Do you have sorethroat ?
4. Do you remember anything after getting drugs to sleep ?
5. Do you have any pain anywhere in the body?
6. Did you have headaches after you woke up?
7. Did you have any eye or vision problem after you woke up ? YES/NO
8. Did you have any pain in teeth +* YES/NO.
9. Did you feel pain at the site of injection* YES/NO.
10. Did patient need repeat dose of reversal + YES /NO.

+ CHECK NOTES * EXAMINE PATIENT.

APPENDIX 1.

NO	YES		
	MILD	MODERATE	SEVERE
	Excessive salivation	Bilious taste, in mouth with salivation	Continued after vomiting needing antiemetic
	Once	More than once but noantiemetic drugs given.	Continued inspite of antiemetric drugs.
	Irritation of throat	Painfull swallowing	Continous pain
	One incidence	More than one incidence	Most of it with vivid discription
	One site only	More than one site	Total body ache.
			REMARKS

APPENDIX II

MINOR COMPLICATIONS OF ANAESTHESIA.

NAME:.....I.P. NO.....

AGE:.....SEX.....WEIGHT.....

WARD.....BED.....

OPERATION.....

ANAESTHETIST.....

.....

PRE-OPERATIVE OBSERVATIONS.....

PULSE...../MIN BP.....MMHG R/R...MIN. TEM..C

PREMEDICATION

DRUGS	DOSE	TIME GIVEN
1.....		
2.....		
3.....		

DRUGS USED FOR ANAESTHESIA (INCLUDING GASES AND ANAESTHETIC AGENTS)

DRUGS	DOSE	TIME GIVEN
1.		
2.		
3.		

4.

5.

6.

IV FLUIDS BLOOD/PLASMA/PLASMA SUBSTITUTE/

N.SALINE/DEXTROSE/HARTMANS/OTHERS.

TYPE OF AIRWAY MASK/INTUBATION TUBE SIZE

PLAIN/CUFF/PACK

RESPIRATION SPONTANEOUS/I.P.P.V.

MANUAL/VENTILATORY(TYPE)

INTRA OP OBSERVATION (QUARTER HOURLY)

TIME						
PULSE						
BP.						

REVERSAL DRUGS DOSE

POST OP OBSERVATIONS

PULSE...../MIN BP.....mmHg R/R /MIN TEMP..^{0}C

COMPLICATIONS

	ABSENT	MILD	MODERATE	SEVERE
NAUSEA				
VOMITING				
SORETHROAT				
MUSCLE PAINS				
AWARENESS				
TRAUMA TO TEETH & GUMS				
OTHERS*				

REMARKS.

*HEADACHES, OCCULAR COMPLICATIONS, INCOMPLETE REVERSAL, VASCULAR COMPLICATIONS.