An audit of emergency anaesthesia and surgery

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Abstract

Background: Emergency surgical patients pose problems in initial resuscitation, anaesthetic and surgical management and postoperative care. Lack of basic amenities, scarce financial resources and poor organization of available health resources are factors that negatively influence the quality of surgical care rendered in developing countries. This paper presents findings of an audit of emergency surgical and anaesthetic services provided at the main theatre of the Ahmadu Bello University Teaching Hospital, Kaduna *(ABUTHK)* in year 2001. Our focus was to survey emergency surgical and anaesthetic services over a twelve-month period in order to evaluate the pattern of presentation and adequacy of management of surgical emergencies.
Method: Data collected for all emergencies booked at the *ABUTHK* main theatre included grade of anaesthetists and operating surgeons, the age, sex and ASA class of patients. Also, the time of booking surgery, actual time of surgery, type of anaesthesia given, immediate outcome of surgery, cases booked but not done and the reasons, were all examined. Analysis of the data relied on simple statistical tables and charts.
Results: Three hundred and forty eight patients were booked for emergency surgery within the study period while 331 emergency surgeries were actually performed. The surgery cancellation rate was 4.8%. Young adult females with obstetric emergencies formed the bulk of the patients requiring emergency surgery. 57.7% of emergency surgeries were performed outside normal working hours. Surgical residents handled 66.13% of the emergencies while anaesthetic residents and nurse anaesthetists provided anaesthesia for 96.3% of patients. General anaesthesia was most often given. Emergencies were sometimes delayed or not done due to lack of theatre space, electricity, water, sterile gowns, anaesthetic drugs, investigation results and patients' inability to pay.
Conclusion: Provision of a separate daytime emergency theatre, constant electricity and water and a functional health insurance scheme would solve most of the problems encountered.

Key words: Anaesthesia, emergency surgery, daytime emergency theatre, health insurance

Introduction

Emergency surgery constitutes a significant proportion of surgical work done in most hospitals. Binam et al [1] found that 63.3 % of all emergency hospital admissions were surgical. Normally emergency surgical conditions leave very little time for optimal pre-operative patient preparation. The situation is further worsened in third world countries where patients would present in hospital as emergency only after all other forms of treatment have failed and life threatening complications have already set in. [1] This is mainly due to cultural practices compounded by financial constraints and ignorance. Anaesthesia for any emergency surgery carries a particularly high risk to the patient because there is hardly time to optimise the patient's condition before [illegible] aim of [illegible] to the additional [illegible] anaesthesia and surgery. In [illegible] emergency surgery may be unduly [illegible] for several reasons. Patients have to pay for surgery and anaesthesia before they can be taken to the operating theatre. Patients' relatives sometimes have to run out at night and buy [illegible] drugs and [illegible] required [illegible] [illegible] to this is the [illegible] with the [illegible] and aspiration. [illegible] hardly surprising if [illegible] several emergencies is

[illegible] of the management of [illegible] conditions in Ahmadu [illegible] Teaching Hospital, [illegible], with the aim of [illegible] [illegible] of presentation of [illegible] as well as the [illegible] of emergency [illegible] over a period [illegible] from January to [illegible] implementation of the [illegible] hopefully contribute to [illegible] ways of improving [illegible] emergency [illegible] Ahmadu Bello University Teaching Hospital, Kaduna (ABUTHK) and hospitals with similar conditions to ABUTHK.

Materials and Methods

The emergency surgeries booked at the main theatre of ABUTH, Kaduna between January and December 2001 were prospectively recorded. Patients' name, age, Hospital number, diagnosis, type of surgery and time of booking were recorded. These were later compared with the theatre register of operated cases and the anaesthetic register. Details on the actual time of starting surgery, the operating surgeon and attending anaesthetist, were obtained from the theatre register. Anaesthetic records provided information on the anaesthetic method and ASA status of patients. The folders of patients booked for surgery but not done were traced to ascertain the reasons for cancellation of surgery.

Results

Of the 348 patients studied, 77% (268) were females while 23% were males. The majority of patients were between 20 and 30 years of age (43.2%) (Figure 1).

Obstetric and Gynaecological emergencies formed the bulk of emergency surgeries done (65.31%). These were mainly Caesarean sections, ruptured uterus, incomplete abortions and ruptured ectopic gestation. Indications for Caesarean section were, cephalo pelvic disproportion, failed induction of labour, foetal distress, two or more previous caesarean sections in labour. Others were general surgical cases (21.04%) orthopaedics (6.04%), ophthalmology (6.34%) and maxillo-facial (1.21%) (Figure 2).

Anaesthetic residents and nurse anaesthetists conducted the anaesthesia for 96.34% of the patients while a consultant anaesthetist was present in only

3.66% of emergency cases. Consultant surgeons handled 34.74% of the emergencies while the rest (65.76%) were done by surgical residents (Table 1).

Of the patients who presented for emergency surgery, 96.52% had some form of systemic derangement as shown in the analysis of their ASA status in Figure 3. 48% of patients had systemic disease either pre-existing or arising from the surgical condition and were classified as ASA 2. Systemic derangement included metabolic acidosis, endotoxic shock, uncontrolled diabetes mellitus, uncontrolled hypertension, dehydration, hypovolaemic shock and electrolyte imbalance- mainly hyponatraemia, hypokalaemia and hyperkalaemia.

Not all emergencies booked were eventually operated upon. Reasons for not operating were inability of patients to pay for surgery and death of patient. In some cases the surgical condition resolved itself and surgery was no longer an emergency. The study observed a cancellation rate of 4.8%. This was determined as the ratio of emergencies booked but not done to the total number of emergencies booked in one year, expressed as a percentage.

The majority (57.3%) of emergency surgeries was performed after normal working hours, between the hours of 4.00 p.m. and 8.00 a.m. Emergency surgery was not always performed at the times scheduled. Reasons for this ranged from no investigation results through no halothane, to no light, and no sterile gowns/linen, and faulty operating table. Lack of electricity was the commonest reason for delay of operations (Table 2).

The method of anaesthesia used is shown in Table 3. General anaesthesia with endotracheal intubation was most frequently used.

Figure 1: Age distribution of emergency surgical patients

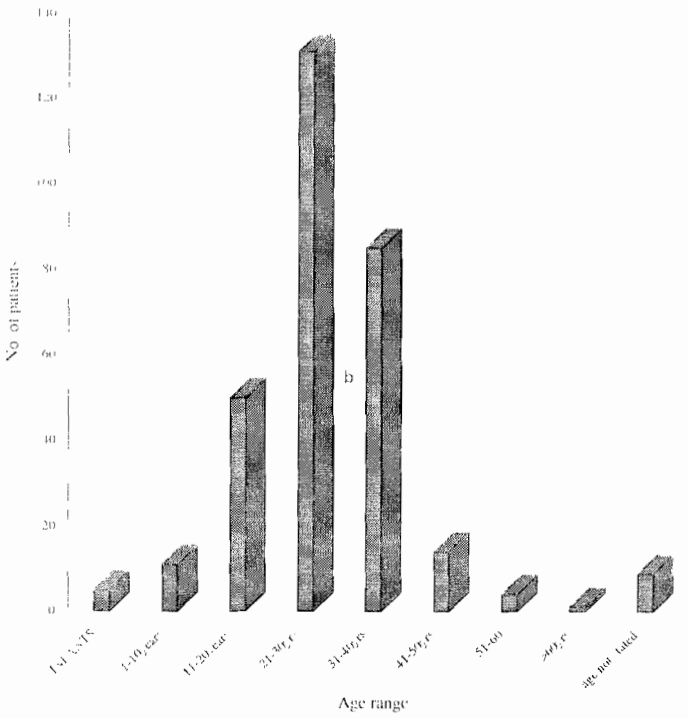

Table 3: Methods of anaesthesia used in emergency surgery

Type of anaesthesia	No.	(%)
General anaesthesia	298	90.03
Total intravenous anaesthesia (tiva)	18	5.45
Local infiltration	9	2.71
Spinal analgesia	6	1.81

Discussion

The U.K. National Confidential Enquiry into Perioperative Deaths (NCEPOD) defines emergency surgery as "immediate life-saving operation, where resuscitation is simultaneous with surgical treatment." [2] The surgery is usually undertaken within one hour. This definition while understood, has not always been strictly applied in ABUTHK. Because of the various factors militating against prompt surgical interventions emergency surgery has come to include surgeries undertaken sometimes days after the onset of life-threatening events. While Camping et al [2] found blocked theatres, unavailable surgical staff and poor communications to be the reasons for delays in treating emergency surgical patients, this survey revealed that often surgery could not be done on schedule due to lack of basic amenities like light, water and sterile gowns and inability of patients to pay for surgical services. The provision of quality surgical care therefore is largely dependent on the economic development of the society.

Obstetric and gynaecological emergencies accounted for the bulk of emergency bookings seen in this study. Luhman and Marsh [3] found that half of the cases in their survey of emergency anaesthetic services in three hospitals were obstetric. Emergency Caesarean Sections for cephalopelvic disproportion, ruptured uterus ruptured ectopic gestation and incomplete abortion in that order made up the obstetric emergencies. This is a reflection of the state of maternal health care and awareness, and the heavy workload of obstetric anaesthesia.

Junior on-call staff handled a high proportion of the emergencies. Anaesthetic residents working with nurse anaesthetists, handled most of the emergencies while junior surgical registrars operated upon most of them. This is consistent with other studies [4] where findings show emergencies being carried out, most of the time, by junior members of the health team. With good communication between juniors and their senior colleagues it is possible for patients to receive adequate and appropriate care. This arrangement also affords the junior practitioner the opportunity to practice independently and acquire professional confidence. Where, however, as in the ABUTHK situation, communication with senior colleagues especially at nights is difficult, this raises the question of adequacy of care.

The timing of emergency operations is also similar to what obtains in other settings.57.7% of emergency surgeries took place outside normal working hours. In a similar survey, Baxter, Cuppage, Goldhill and Strunin, [4] found that 47-57% of all emergency events occurred between 5.00 p.m. and 2.00 a.m. Part of the reason for this observation in this study could be the fact that there is no designated emergency theatre for emergency surgery. Elective lists either have to be interrupted to make room for emergencies or the emergency surgery is delayed till the end of the elective list for the day, which makes nonsense of the 'emergency' character of the emergencies. Provision of a daytime theatre for emergency operations may reduce night surgeries and provide greater supervision and training opportunities for residents. This is important if emergencies are to be treated as emergencies in line with the standard definition of emergency surgery as, prompt life-saving operation, usually undertaken within those critical hours in

which resuscitation is simultaneous with surgical treatment. The standard should not be lowered to accommodate the self-imposed limitations and failings of our system.

In spite of the fact that majority of the emergency surgical cases, were managed by junior residents, the immediate postoperative conditions of the patients were satisfactory in 97.4% of cases. Mortality was recorded in only 2.6% of the cases. This could be interpreted as signifying that junior on-call staff inspite of all odds, have managed to acquire good surgical and anaesthetic management skills since communication with senior colleagues especially at nights is difficult.

The satisfactory outcome may also be attributed to the fact that most of the patients presenting for emergency surgeries belonged to ASA class 11 and were not really moribund patients. The ASA classification of anaesthetic risk of a patient as 11 implies that such a patient has a disease condition causing mild systemic derangement preoperatively. Increasing ASA status, inadequate patient preparation and emergency surgery have been found to be significant risk factors and predictors of peri-operative outcome.[5 8] The ASA classification, however, cannot be relied on as the sole indicator of patient's clinical condition since there is considerable variation in classification among anaesthetists.

General anaesthesia was most often given for the surgical intervention. It is easier to perform and faster than regional blockade and does not require as much expertise as regional techniques.

Emergencies were sometimes delayed or not done due to lack of theatre space, electricity, water, sterile gowns, investigations results and financial constraints on the part of the patients. The present situation where patients pay for everything before surgery can commence is a serious set back to surgical health care delivery and a negative impact on the outcome of emergency surgical management. The introduction of complete surgical and anaesthetic packs for those patients who can afford them would eliminate the time wasted by patients' relatives to go outside and buy. This system could be sustained by operating a revolving fund scheme in which packs are replenished from money generated from sale of previous packs. Provision of a separate daytime emergency theatre and basic amenities like constant electricity and water would minimise delays in surgical intervention and reduce surgery cancellation rate. Finally, the eventual commencement of the proposed national health insurance scheme should eliminate most of the problems of delay of emergency surgical treatment because the insurance agency would provide all that is needed to enable patients who have paid their premium get treatment without the present bottlenecks.

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