The quality of pre-operative preparation of patients undergoing elective surgery at the University Teaching Hospital of Kigali, Rwanda

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ABSTRACT

BACKGROUND: Pre-anesthesia preparation is essential for safe surgery. However, little is known about the quality of pre-anesthesia preparation in Rwanda. The objectives of this project were to evaluate the quality of pre-anesthesia preparation at the University Teaching Hospital of Kigali (CHUK) and to determine areas that need improvement.

METHODS: A cross-sectional survey using a convenient sampling method was conducted during the period from November 1st to November 30th 2016.
We collected data on completeness of information on the operations list, timing of anesthesia visit, the rate of anesthesia consultations, the rate of explanation of the type of anesthesia and options of pain control, and the rate of non-optimized cases.

RESULTS: Among 109 patients enrolled in the study, 44 (40.4%) were females and 65 (59.6%) were males. Only 60 (55%) were written on the operation list before 1h00 pm. Name, age, hospital address, and diagnosis and procedure were mentioned in 93 (85,6%), 87 (89.2%), 80 (73.4%), and 99 (90.6%) respectively. Pre-anesthesia evaluation was done in 90 (82.6%) and mainly between 1h00 pm and 5h00 pm 62 (56.9%). The types of anesthesia and pain control were explained in 87 (79.8%) and 67 (61.5%) patients respectively. Results of investigations were available for 97 (89%) patients, 6 (5.5%) patients required optimization and 2 (1.8%) patients were postponed.

CONCLUSION: Despite a good performance in many aspects of pre-anesthesia preparation, an effective intervention is needed to improve some areas. Mainly the utilization of the operations' list and standardization of the pre-anesthesia preparation.

INTRODUCTION

Pre-anesthesia evaluation is the process of clinical assessment by an anesthetist, which precedes the delivery of anesthesia care for surgical and non-surgical procedures [1]. The pre-anesthesia evaluation is essential and provides multiple benefits such as improved perioperative morbidity and mortality, decreased rates of cancelled cases, improved care to patients with coexisting diseases,

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better operating room and bed utilization, reduced length of stay and the associated costs as well as decreased errors of communication among teams [2 - 4].

The content of the pre-anesthetic evaluation includes, but is not limited to, review of medical records, patient interview, pre-anesthesia examination (focusing on assessment of the airway, lungs, and heart), preoperative investigations, and specific consultations when appropriate [1].

There are not enough data in the literature on the optimal timing for pre-anesthesia evaluation. However, the timing of the pre-anesthetic evaluation can be guided by considering combination of surgical invasiveness, severity of disease, and availability of resources [1].

The pre-anesthesia clinic was started in February 2016 with the aim of conducting a systematic pre-anesthesia evaluation for all patients undergoing elective surgery, to communicate effectively with other team members (surgeons and theater nurses), and to provide timely and safe anesthesia. Since the introduction of pre-anesthesia clinic services at the University Teaching Hospital of Kigali (CHUK), the quality of services provided has not yet been determined.

The aim of the study was to determine the quality of pre-operative preparation of patients undergoing elective surgery at CHUK. The results of this study will help improve the quality of pre-anesthesia preparation in CHUK.

METHODS

Study design and study population: This was a cross-sectional survey of all patients undergoing elective surgery in the main operating room of CHUK over a one-month period (November 2016) using a convenience sampling method.

Study procedures: A diverse quality improvement team was formed in June 2016 to conduct this project. Members included 3 anesthesiologists, 1 anesthesia resident, 5 anesthetists and 1 hospital quality improvement team member. The team selected the quality of pre-anesthesia clinic services as an issue that needs to be addressed and the team decided to use the strategic problem-solving methodology to determine gaps to be addressed in order to ensure high-quality pre-anesthesia clinic services. The team decided the criteria of pre-ansthesia preparation based on the hospital policy on prepartion of patients for elective surgery (Table 1).

Table 1: *Criteria of pre-anesthesia preparation*

1. Having patients information (age, hospital address, as well as diagnosis and procedure) on operation list at least one day before surgery
2. Doing pre-anesthesia evaluation for every patient
3. Filling the pre-anesthesia evaluation form completely
4. Explaining the type of anesthesia
5. Explaining the type of pain control
6. Ensuring availability of required investigations
7. Not postponing surgery after arrival of patient in the operating room

Inclusion criteria: all patients undergoing elective surgery in the main operating room of CHUK.

Exclusion criteria: Patients with missing pre-anesthesia evaluation form were excluded from analysis.

Study Setting: This study was conducted at CHUK, the major referral hospital in Rwanda with around 513 beds, serving around 6,200,000 people, and conducting approximately 12,000 surgeries annually [6].

Data collection, variables, and outcomes: We conducted a cross-sectional survey on the quality of pre-anesthesia evaluation by collecting data from the patients' files. During 1 month, we looked at patients' characteristics (age, sex, residence, availability of health insurance, American Society of Anesthesiologists (ASA) class, type of planned surgery, type of anesthesia proposed, and level of urgency of surgery) and main outcomes on quality of anesthesia clinic services (admission time in the hospital, frequency of pre-anesthesia evaluations, timing of writing patients on operation list, patients information on operation list, performance of pre-anesthesia evaluation, timing of pre-anesthesia evaluation, explanation of type of anesthesia, explanation of pain control, availability of required investigations, and course of action once the patient is in theater).

Data management and analysis: Data were entered electronically into an excel spreadsheet from paper forms. Then, descriptive statistics were used to report patient demographics and the main outcomes. Frequencies and percentages were used for categorical data. Data were analysed using Excel version 2010, and we reported the frequency and rate of occurrence of all variables.

Ethics approval, consent to participate, and confidentiality: Ethical approval was obtained from the University Teaching Hospital of Kigali Institutional Review Board (Reference number: EC/CHUK/728/2018).

Consent was obtained from participants with option to decline participation in the study. A unique identifying number was given to participants and was known only to the principal investigator. All data were collected under that unique identifying number.

After data collection any identifying information was destroyed or removed from the research records. The data record was kept in a password protected computer in the office of the Head of department of Anesthesia at CHUK. After 5 years, the data record will be completely destroyed.

RESULTS

Among 109 patients enrolled in the study, 44 (40.4%) were female and 65 (59.6%) were male (Table 2).

Table 2: *Patient characteristics (N=109)*

		N	%
Gender	Male	65	59.6
	Female	44	40.4
Age	< 1 year	6	5.5
	1-5 years	16	14.7
	6-15 years	10	9.2
	>15 years	77	70.6

Only 60 (55%) patients were written on the operation list before 1pm. Name, age, hospital address, as well as diagnosis and procedure were mentioned in 93 (85,6%), 87 (89.2%), 80 (73.4%), and 99 (90.6%) respectively. Pre-anesthesia evaluation was done in 90 (82.6%) with most (n=62, 56.9%) evaluations completed between 1h00 pm and 5h00 pm. The types of anesthesia and pain control were explained to 87 (79.8%) and 67 (61.5%) patients respectively. Results of investigations were available in patients' files for 97 (89%) patients. Six (5.5%) patients required further optimization prior to surgery and 2 (1.8%) patients' operations were postponed (Appendix 1).

DISCUSSION

In our study, the quality of pre-anesthesia preparation showed many areas of improvement. For instance, more than 50% of patients scheduled for major procedures are put on the list after 1h00 pm and this leaves a short time for evaluation.

Seventeen percent of patients had no pre-anesthesia evaluation before entering the operating room, 14.7% had no name on the list, 26.7% had no hospital address on the list, and 10% of patients had neither diagnosis nor procedure on the list. This can lead to delays and cancellations of cases which are usually avoided within a well-functioning pre-anesthesia clinics which has better optimization, adequate communication, and consensus of the decision to proceed to surgery [7].

Even for patients who had a pre-anesthesia visit, there is evidence of the low quality of care. Only 61.5% of patients were explained about pain control options and around 80% were explained

about the type of anesthesia. This inadequate communication with patients as well as lack of standardized process for pre-anesthesia evaluation and insufficient cooperation among teams have been also described in other settings like the report published by the Inspection of Healthcare (IGZ) in Netherland in 2007 [8].

During the study period, the anesthesia visit was done by non-physician anesthetists with 3 or 4 years post-secondary school training under the guidance of physician anesthesiologists. The same approach has been done efficiently and safely in other settings like the USA as described by Polland in 1996 [9].

This study also showed examples of inadequate communication among teams as evidenced by delayed completion of the surgical list or incomplete patient information on the list. This may have an impact on efficient use of the operating room, and leads to delay or cancellation of operations. With a poorly functioning pre-anesthesia clinic, there is a risk to lose the benefits of an adequate pre-anesthesia clinic which reduce volumes of laboratory tests, imaging investigations, patient satisfaction, decreased cancellation rate, increased rate of same-day admission, and decreased length of hospital stay [7, 10].

Despite a good performance in many aspects of pre-anesthesia preparation, an effective intervention is needed to improve some areas mainly the utilization of the operations' list and standardization of the pre-anesthesia preparation.

We recommend training of all anesthesia staff on pre-anesthesia evaluation and organizing the pre-anesthesia clinics in collaboration with the consultations of surgeons, which start at 8h00am so that patients can be seen by anesthesia team immediately after being scheduled for surgery. This will allow more time for pre-anesthesia evaluation. We also propose the use of a standardized patient information form for easy communication among teams.

The sample size was small with a convenience sampling method and the follow-up time was short. Therefore, the results may not be applicable to all types of surgery. In addition, this study included only elective cases done during day shifts on regular days. Therefore, results may not reflect the pre-anesthesia evaluation for cases done during the night and on weekends.

Authors' contributions: ET and JBU led the study design, protocol development, data analysis and manuscript writing. JDN, JN, UJB, MN, JR, and DB contributed to study design, protocol development and results' interpretation. ET and MN led and supervised data collection and data cleaning and analysis. All authors critically reviewed and approved the final manuscript.

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Appendix 1: *Indicators of quality of pre-anesthesia preparation (N=109)*

		N	%
Admission time in the hospital	Before 12h00 pm	36	33
	Post 12h00 pm	55	50.5
	No information	18	16.5
Timing of writing patients on operation list	Before 12h00 pm	60	55
	Between 12h00 pm and 4h00 pm	31	28.4
	After 4h00 pm	15	13.8
	No information	2	1.8
Patients information on operation list			
Name	Yes	93	85.3
	No	16	14.7
Age	Yes	87	79.8
	No	22	20.2
Hospital address	Yes	80	73.4
	No	29	26.6
Diagnosis and procedure	Yes	99	90.8
	No	10	9.2
Pre-anesthesia evaluation done	Yes	90	82.6
	No	19	17.4
Timing of pre-anesthesia evaluation	Before 12h00 pm	23	21.1
	Between 12h00 pm and 5h00	62	56.9
	After 5h00 pm	18	16.5
	No information	6	5.5
Explanation of type of anesthesia	Yes	87	79.8
	No	22	20.2
Explanation of pain control	Yes	67	61.5
	No	42	38.5
Availability of lab results	Yes	97	89
	No	12	11
Course of action within Theater	Proceed with surgery	101	92.7
	Optimization then surgery	6	5.5
	Postponed	2	1.8