

Endotracheal tube cuff pressure estimation techniques: safety and reliability among women undergoing general anaesthesia with intubation for cesarean section

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		<input type="checkbox"/> Protocol
Registration date 16/07/2021	Overall study status Completed	<input type="checkbox"/> Statistical analysis plan
		<input type="checkbox"/> Results
Last Edited 10/11/2021	Condition category Pregnancy and Childbirth	<input type="checkbox"/> Individual participant data
		<input type="checkbox"/> Record updated in last year

Plain English summary of protocol

Background and study aims

An endotracheal tube is a flexible plastic tube that is placed through the mouth into the windpipe (trachea). The use of an endotracheal tube has become routine for women undergoing general anaesthesia for a cesarean section. Its insertion can damage the trachea due to excessive pressure in the cuff. This study aims to compare the techniques involve in cuff inflation and its corresponding pressure estimations as well as associated complications among parturients undergoing general anaesthesia with intubation for cesarean section at the obstetric unit of the Tamale Teaching Hospital.

Who can participate?

Pregnant women aged 18 to 40 undergoing cesarean section under general anaesthesia with intubation

What does the study involve?

An anesthesiologist inflates the endotracheal tube cuff and determines the cuff pressure using either of the following techniques: standard manometer, predetermined volume of air (10 - 15 ml), or manual palpation of the endotracheal tube pilot balloon immediately after intubation. Before extubation, the pressure gauge is used to measure the actual pressure generated using manual palpation of the pilot balloon or the predetermined volume of air (10 - 15 ml).

What are the possible benefits and risks of participating?

The findings of this study will provide information on endotracheal tube cuff pressure procedures and will influence anaesthesia clinical policies, the monitoring of endotracheal tube cuff pressure and its estimation. Cuff pressure associated complications (cough, sore throat, hoarseness, and blood-streaked expectoration) may result.

Where is the study run from?

Tamale Teaching Hospital (Ghana)

When is the study starting and how long is it expected to run for?
December 2020 to November 2021

Who is funding the study?
Investigator initiated and funded

Who is the main contact?
Dr Sylvanus Kampo
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Contact information

Type(s)
Scientific

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Additional identifiers

Clinical Trials Information System (CTIS)
Nil known

ClinicalTrials.gov (NCT)
Nil known

Protocol serial number
UHAS REC A.9[114]20-21

Study information

Scientific Title

Endotracheal tube cuff pressure estimation techniques: safety and reliability among parturients undergoing general anaesthesia with intubation for cesarean section at the obstetric unit of the Tamale Teaching Hospital. A prospective randomized comparative study

Study objectives

The experience in cuff pressure estimation by the anaesthesia providers correlates poorly within therapeutic limits. The manual palpation of the pilot balloon technique is associated with a high incidence of cough, sore throat, hoarseness, and blood-streaked expectoration among parturients. The standard manometer technique is the ideal and should routinely be used to estimate endotracheal tube cuff pressures among parturients undergoing cesarean section under general anaesthesia

Ethics approval required

Old ethics approval format

Ethics approval(s)

Approved 01/06/2021, the ethical committee of the University of Health and Allied Sciences (PMB 31, Ho Volta Region, Ghana; +233 (0)362196193; rec@uhas.edu.gh), ref: UHAS REC A.9[114] 20-21

Study design

Prospective randomized comparative study

Primary study design

Interventional

Study type(s)

Diagnostic

Health condition(s) or problem(s) studied

Elective cesarean section

Interventions

All parturients are prospectively assessed and classified according to the American Society of Anesthesiologists (ASA) physical status classification. Basic intraoperative monitoring (ECG, SpO₂, temperature, and non-invasive blood pressure) is applied, and the baseline vital signs are checked and recorded. The individual parturient is advised not to eat any solid food for at least 6-8 hours before surgery. An independent anesthesiologist is assigned to perform the intubation and monitor the patient till discharge from the hospital.

In the supine position, the parturient is anaesthetized with propofol 1.5-2 mg/kg, succinylcholine 1.0 mg/kg, and then intubated with the appropriate endotracheal tube size (internal diameter of 6.5 or 7 mm with a cuff type of high-volume low pressure). Successful insertion of the endotracheal tube is confirmed by the presence of equal bilateral breath sound. The vital signs (pulse rate, blood pressure, oxygen saturation, and respiratory rate) of the individual parturient are monitored and recorded every 5 minutes for the first 30 minutes and then for every 15 minutes. Any estimated deficit of fluid or blood loss is replaced accordingly. An independent

anesthesiologist blinded to the study is asked to inflate the endotracheal tube cuff and determine the cuff pressure using either of the following techniques; standard manometer, predetermined volume of air (10 - 15 ml), or manual palpation of the endotracheal tube pilot balloon immediately after intubation. Again, prior to extubation, the pressure gauge is used to measure the actual pressure generated using the manual palpation of the pilot balloon, or the predetermined volume of air (10 - 15 ml).

Intervention Type

Device

Phase

Not Applicable

Primary outcome(s)

1. Endotracheal tube cuff pressure determined using a standard manometer, predetermined volume of air (10 - 15 ml), or manual palpation of endotracheal tube pilot balloon immediately after intubation or prior to extubation. The technique used and the cuff pressure estimated in each group is recorded
2. Cuff pressure associated complications (cough, sore throat, hoarseness, and blood-streaked expectoration) determined during an interview after 24 hours of extubation

Key secondary outcome(s)

Overall perioperative satisfaction, evaluated as 4 = excellent, 3 = good, 2 = satisfactory, 1 = poor, during an interview on the day of discharge

Completion date

30/11/2021

Eligibility

Key inclusion criteria

1. Parturients scheduled for elective cesarean section under general anaesthesia with endotracheal intubation
2. Aged 18 to 40 years
3. American Society of Anesthesiologists Physical Status (ASA-PS) score 1-2

Participant type(s)

Patient

Healthy volunteers allowed

No

Age group

Adult

Lower age limit

18 years

Upper age limit

40 years

Sex

Female

Total final enrolment

389

Key exclusion criteria

1. Patients with a history of difficult intubation or multiple attempts (more than three attempts) during intubation
2. Parturient requiring emergency intubation
3. Parturient with a higher risk for aspiration
4. Intubation performed by non-anaesthesia staff
5. Parturient with known anatomical laryngotracheal abnormalities
6. Those expected to remain intubated beyond the operation room period

Date of first enrolment

01/06/2021

Date of final enrolment

30/11/2021

Locations**Countries of recruitment**

Ghana

Study participating centre

Tamale Teaching Hospital

Post Office Box 16

Tamale

Ghana

00233

Study participating centre

Habana Medical Center

Tamale

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Sponsor information**Organisation**

Funder(s)

Funder type

Other

Funder Name

Investigator initiated and funded

Results and Publications

Individual participant data (IPD) sharing plan

The datasets generated during and/or analysed during the current study are/will be available upon request from Dr Sylvanus Kampo (sylvanuskampo@yahoo.com).

IPD sharing plan summary

Available on request

Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
Participant information sheet	Participant information sheet	11/11/2025	11/11/2025	No	Yes