ADDIS ABABA UNIVERSITY

MAGNITUDE OF INTERAOPERATIVE AND POSTOPERATIVE HYPOTHERMIA AND ASSOCIATED FACTORS, AMONG PEDIATRIC PATIENTS THAT WERE OPERATED IN TIKUR ANBESSA SPECIALIZED HOSPITAL

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ABSTRACT

BACKGROUND: -Humans maintain constant body temperature within a wide range of changes in external environment. Perioperative hypothermia is one of the major problems during surgery that can affect operated pediatric patients.

OBJECTIVE: - The objective of this study was to determine magnitude of intraoperative and postoperative hypothermia and determinant factors among pediatric patients operated in Tikur Anbessa Specialized Hospital from January to February, 2016.

METHODS: - Study was conducted with Cross sectional study design. All selected elective surgical pediatric patients, between 1 January 2016 and 30 March2016 were eligible to the study.

Data was entered into Epi info version 7 and exported to SPSS version 20 for analysis. Binary Logistic regression was used to test each factor with the dependent variable, and variables with P value of <0.2 were carried to multi variant analysis. 95% C.I. and P value of <0.05 was used as a cutoff point to test for significance of associations.

RESULTS: -A total number of 90 pediatric patients were enrolled to the study of whom 26 females and 64 males. The ages of patients varied from 26 days to 14 years (mean 5.63 ±4.40). Hypothermia incidence was calculated after induction, an hour and two hours of induction was 72.2%, 64.4%, 83.8% respectively. After third hours there were three cases but all had been hypothermic. And postoperative incidence of hypothermia was 78.9% of all pediatric patients.

Conclusion: -Intraoperative and Postoperative hypothermia is a common problem in this Hospital. Therefore, we suggest that temperature monitoring, patient warming and OR temperature managing should be a routine procedure during anesthesia management and PACU.

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ACRONYMS:

AAU: Addis Ababa University

ASA: American society of Anesthesiology

BMI: body mass index

BSA: Body Surface Area

BSc: Bachelor of science

C.I: confidence interval

EAA: Ethiopian Anesthetist Association

ENT: Ear Nose Throat

ETB: Ethiopian birr

GIT: Gastrointestinal trucks

GUH: Gondar University Hospital

IV: Intervenes

MOH: Ministry of Health

MSc: Master of science

OR: operation room

PACU: post anesthesia care unite

TASH: Tikur Anbessa Specialized Hospital

UK: United Kingdom

USA: United State of America

VAS: Visual Analogue Scale

CHAPTER ONE: INTRODUCTION

1.1.BACKGROUND:

Hypothermia is the most common intraoperative and postoperative disturbance in pediatric patients. Pediatric patients are highly vulnerable to hypothermia and its associated complications, Pediatric patients have a larger surface area per kilogram than adults. Metabolism and its associated parameters (oxygen consumption, CO2 production, cardiac output, and alveolar ventilation) correlate better with surface area than with weight [1].

Thin skin, low fat content, and a greater surface area relative to weight promote greater heat loss to the environment in neonates. This problem is compounded by inadequately warmed operating rooms, prolonged wound exposure, administration of room temperature intravenous or irrigation fluid, and dry anesthetic gases [2]. Of course, there are also effects of anesthetic agents on temperature regulation. The more important mechanisms for heat production in neonates are non-shivering thermogenesis by metabolism of brown fat and shifting of hepatic oxidative phosphorylation to a more thermogenic pathway. Metabolism of brown fat is severely limited in premature infants and in sick neonates who are deficient in fat stores. Furthermore, volatile anesthetics inhibit thermogenesis in brown adipocytes [3].

Humans maintain constant body temperature despite of changes in external environment. Core body temperature is maintained within narrow range; because enzyme systems in the body have narrow temperature ranges in which they function optimally for caring out different activities in the body as metabolism, conduction of nervous function and skeletal muscle contraction [4,5].

Hypothermia is defined as core body temperature of $<36^{o}C$. It could be classified in to three as mild (35-35.9^{o}C), moderate (34-34.9^{o}C) and severe when core body temperature is $\leq 33^{o}C$ [6].

Pediatric Patients under Anesthesia and surgery can have altered thermoregulation due to different reasons. These mechanisms include loss of normal response to heat loss (lack of shivering), increased heat loss to environment when body cavity is opened to cold operation room environment, cooling effect of cold anesthetic gases and reduced body heat production due to reduced metabolic rate [7].

Heat can be lost during surgery by different mechanisms. There are four means of heat loss. The dominant one is heat loss by radiation which accounts for 60% of heat loss. Any objects with temperature above

absolute zero degree can loss heat to objects surrounding it. The second means of heat loss is heat loss by conduction which is facilitated by temperature difference between the patient and objects. This type of heat loss constitutes for 20% of heat loss during surgery [8, 9].

Heat loss by convection is another means of heat loss which occurs due to direct contact of the patient with objects. Cold operation room table and cold OR attires facilitate this type of heat loss [10].

Evaporative and respiratory tract heat losses are other means of heat loss which are heat loss that occur via skin and respiratory tract. Evaporative heat loss mainly occurs by use of cold skin preparation solutions, while heat loss via respiratory system is facilitated by use of cold and dry anesthetic gases [11,12].

Mild intentional Hypothermia is sometimes induced in an attempt to reduce cerebral and myocardial ischemia, but there are ample evidences that showed that hypothermia will have many adverse consequences on surgical patients [13-17].

Hypothermia is one of common events during perioperative time and can have different consequences that increase perioperative morbidity and mortality. A core temperature of less than 34°C is highly associated with mortality due to coagulopathy, metabolic acidosis, multiple organ failure, hemodynamic instability and infections [18].

Hypothermia depresses myocardial contractility; particularly depression of left ventricular contractility occurs with mild hypothermia. It also results in both atrial and ventricular rhythm disturbances. The initial response to hypothermia is sinus tachycardia which will progress to bradycardia if not corrected soon. Hypothermia also blunts response of myocardium to catecholamine [16,19].

Hypothermia increases cardiac events such as myocardial ischemia and angina. The increased risk of cardiac problems during perioperative time in the presence of hypothermia could be due to increased vasoconstriction, increased level of nor adrenaline and altered alpha adrenoceptortone. Hypothermia also interferes with anesthetic drugs' metabolism that will lead to poor recovery [20] The prevalence of perioperative hypothermia for pediatrics is not studied in country; hence the findings of this study is expected to use as pillar for improve pediatrics management and further study to related issue.

1.2.STATEMENT OF THE PROBLEM:

Intraoperative and postoperative hypothermia is one of major problems during surgery that can affect 50-90% of operated patients [7]. It has been shown by different researchers that hypothermia will result in to various adverse events such as myocardial ischemia, coagulopathy, delayed awakening and wound infections [21-23].

Various attempts had been tried by different investigators to reduce occurrence of perioperative hypothermia. These attempts include warming of intra venous fluids using hot water bath of up to 54^{o}C without adverse effects such as hemolysis. Another active warming technique is warming the patient during operation using forced-air warming device [24-27]. None of these modern technique is present in our set up, except for some efforts by anesthetists such as warming blood by using boiled water. This method can have danger of lysis because there is no means to know the temperature. Since the Hospital is the largest Referral Hospital in the country, the number of patients that visit the hospital increases from time to time, sometimes beyond the capacity of the Hospital to handle [28].

Patients scheduled for operation have to wait outside the operation room (open field) which makes them to be exposed to cold air; hence patients are already at risk of Hypothermia before they are operated; besides there is no facility to warm patients actively. The administration of cold IV fluids, administration of anesthetics and exposure of body cavity to cold operation room environment will further make them to loss heat [29-31].

Though there was two studies conducted in Gondar university Hospital(GUH) which revealed that incidence of postoperative hypothermia for all patients who underwent surgery in 2014 and perioperative hypothermia and associated factors for all patients who underwent surgery in 2015, there is no study conducted to determine incidence of intraoperative and postoperative hypothermia and associated factors for pediatric patients who underwent surgery in TASH, hence this study is aimed to determine incidences of intraoperative and postoperative hypothermia and local factors associated with it.

1.3.JUSTIFICATION OF THE STUDY:

TASH has been performing range of surgical procedures for the last fifty years. There is marked increase in patient flow from time to time, while the operation room facility upgrade remained difficult compare to patient flow increment. Even, health professionals not attention about their patient body temperature. The same way, health managerial not seen to dispense any resources related body temperature measuring materials where in governmental hospitals. So, all these poor facilities challenge to maintain normothermia during perioperative.

Hypothermia affects pharmacokinetics of anesthetic agents and adjuvant drugs including sedatives, muscle relaxants and volatile agents, coagulation system, postoperative wound infection system and causes both hepatic and renal blood flow decrease that will in turn decrease drug metabolism and excretion. These conditions in turn incur additional cost to patients and to the health facility. All these and other effects lead temporary or permanent squall for children while their developing stages. One of Ethiopian millennium development goal is reduction morbidity and mortality of children. Therefore, it is very important to conduct research on intraoperative and postoperative hypothermia and associated risk factors which in turn help the Hospital to decrease the incidence of hypothermia in pediatric patients.

The study will also helpful for program planners and policy makers so as to devise different strategies to prevent or at least reduce risk factors of pediatric hypothermia.

Till date, there is no such study conducted in the study area so that it can be used as a base line data for further researchers.

CHAPTER TWO

2. LITERATURE REVIEW:

2.1 MONITORING OF TEMPERATURE:

Though distribution and heat content of the body not uniform, Core temperature, is the single best indicator of thermal status in humans [7]

2.2. MONITORING SITES:

Pulmonary artery catheter is the gold standard measure of core temperature that is used as a reference for other sites. But its use is limited by its being expensive and invasive and also risky. Esophageal temperature monitor is another method of measuring core temperature that gives accurate measure if used properly, but can be affected by the use of humidified gases during general anesthesia and during neuraxial blocks and postoperative period its use can be inconvenient. Nasopharyngeal temperature can be recorded with esophageal probe place above the palate. Tympanic membrane temperature monitoring is often the preferred method in the preoperative and perioperative areas. The tympanic membrane is close to the carotid artery and hypothalamus and is a noninvasive and accurate measure of core temperature [32-34].

Axillary temperature remains the most widely used and most convenient site for monitoring temperature in children. However, the axillary site is a notoriously unreliable site to measure the core temperature because the probes are often misplaced within the axilla leading to erroneous temperature measurements. The axillary temperature may underestimate the core temperature if the room temperature is low or if room temperature intravenous fluids are infused at high flow rates, particularly in small children when the intravenous is infusing in the same extremity as the axillary temperature is monitored. In contrast, we have documented unusually high axillary temperatures when the tip of the probe senses the hot air from a forced warm air device. One study demonstrated that the axillary site may be as accurate for core temperature estimation as the tympanic membrane, esophageal, and rectal temperature sites. The accuracy of the axillary probe depends on carefully positioning the tip of the probe close to the axillary artery while maintaining the arm tightly adducted [35].

The rectal site, which is easy to access and associated with minimal morbidity, can also provide accurate core temperature measurements. However, these measurements may be inaccurate if the probe becomes embedded in feces or is exposed to cool venous blood return from the legs or if readings become influenced by the proximity of the probe to an open abdominal cavity during laparotomy or the bladder while it is irrigated with either cold or warm fluids. Contraindications to the use of a rectal probe includes imperforate anus, and relative contraindications include inflammatory bowel disease, rectal tumors, neutropenia or thrombocytopenia, coagulopathy, and circumstances in which the bowel or bladder is being irrigated [36].

Bladder temperature is equal to pulmonary artery (core) temperature, provided that there is high urine flow, when urine flow is low it approximates rectal temperature [37,38]

2.3.INCIDENCE OF HYPOTERMIA

According to the study conducted in USA in 2010 on perioperative hypothermia, 52% of children experienced intraoperative hypothermia. The result of the study also revealed that duration of hypothermia ranged from 5-142 minutes (25 ± 22.8) and children who had invasive procedures (i.e., procedures involving an incision) and those who had skin probe monitoring were more likely to have documented hypothermia [39].

The study that done at yamanashi in Japan in 2002 and others studies, thin patients become more hypothermic with more profound redistribution hypothermia than obese patients. Although intraoperative factors affect thermoregulation during longer operations, preoperative patient characteristics are cardinal factors for intraoperative hypothermia, which may cause serious complications postoperatively. Positive thermal care, including pre-warming, can be administered to patients with a high probability of hypothermia and this should reduce the occurrence of severe hypothermia and minimize the occurrence of adverse effects [14,25,40,41,42].

In Ethiopia, Research conducted in University of Gondar Hospital in 2014 on postoperative hypothermia for all age level showed that patient with high ASA physical status, operated under general anesthesia and elective surgical patients were strongly associated with the development of postoperative hypothermia [44].

In other study conducted in the same Hospital in 2015 on Perioperative Hypothermia and Predictors of Intra-Operative Hypothermia, the mean temperature on arrival was 36.3 with standard deviation of 0.7.

Incidence of hypothermia before and after induction was 23.4%,30.5% respectively. Most procedures were completed within 1-2 hours. There were 90 patients whose procedure time was between 2-3 hours and the incidence of hypothermia during this time was 72%. The overall incidence of intra operative hypothermia was 49.7%. Of which mild hypothermia was seen among 37.5%, moderate and severe hypothermia were seen among 10.3 and 1.9% respectively and the overall incidence of post-operative hypothermia was 50.6%. Moderate and severe hypothermia were seen among 36.9 and 5.4% of patients respectively. [5]

2.4.RISK FACTORS FOR INTRAOPERATIVE AND POSTOPERATIVE HYPOTHERMIA:

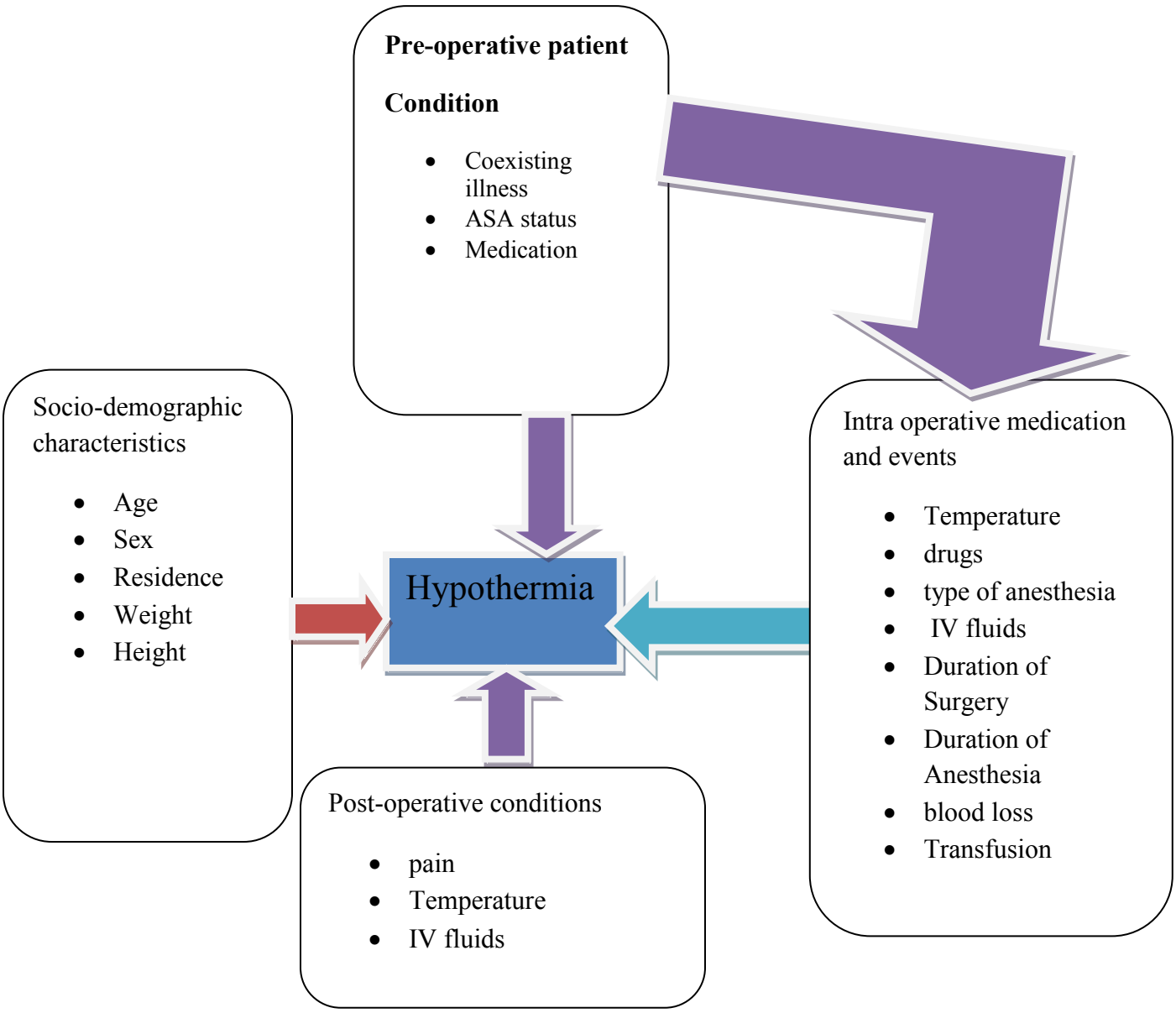
In a prospective observational study conducted in 2012, age, duration of anesthesia and pain in post anesthesia care unit were found to be independent predictors of perioperative hypothermia. According to this study, the incidence of Hypothermia was 42% among patients whose age was > or =65 years of age as compared to 30% among those whose age was < 65 years of age. Median Anesthesia time of 110 minutes was found to increase perioperative hypothermia as compared to median anesthesia time of 70 minutes. Increased VAS score was also found to be independent predictor of perioperative Hypothermia [45]

In a randomized study conducted in 1997 on the role of irrigation in the development of hypothermiaduring laparoscopic surgery, among patients who underwent laparoscopic surgery, amount of irrigating fluid (ambient fluid) and duration of anesthesia were predictors of drop in core body temperature [47]

Another co relational study conducted by Vanessa de BritoPoveda and colleagues in 2009, among patients operated on elective basis described that patient's body temperature was positively correlated with mean room temperature in theatre [48]

In the study conducted by Noriyoshi Tanaka in 2012, patients with perioperative high anxiety level were found to be hypothermic as compared to those patients with low perioperative anxiety level**.** In this particular study, out of 120 patients who were scheduled for major open abdominal surgery 51% developed hypothermia [49].

CONCEPTUAL FRAMEWOR



CHAPTER THREE

3. OBJECTIVE:

3.1.GENERAL OBJECTIVE:

To determine magnitude of intraoperative and postoperative hypothermia and associated factors among pediatric patients operated in Tikor Anbessa Specialized hospital from January to March, 2016.

3.2.SPECIFIC OBJECTIVES:

1. To determine magnitude of intraoperative hypothermia among pediatric patients operated at Tikur Anbessa Specialized Hospital;

1. To determine magnitude of postoperative hypothermia among pediatric patients operated at Tikur Anbessa Specialized Hospital;

2. To identify factors associated with hypothermia among pediatric patients operated in Tikur Anbessa Specialized Hospital

CHAPTER FOUR

4. METHODOLOGY

4.1.STUDY AREA AND PERIOD:

This study was conducted in TikurAnbessa specialized Hospital (TASH) from January to March, 2016. TASH is one of largest referral hospital in the country since 1998 and serves for all referred patients from different part of the country. Annually more than 6,000 people operated for different surgical conditions in the Hospital. The hospital has 8 operation beds which are located 3 in the main operation room, 1 in obstetric unit,4 in Orthopedic and pediatric department. Majority of pediatric patients were operated in the Orthopedic and pediatric theatre which was built unplanned for operation room.

4.2.STUDY DESIGN:

Cross sectional study designwas conducted

4.3.SOURCE POPULATION:

All Pediatric patients that undergone elective surgical procedure atTikur Anbessa specialized Hospital

4.4.**STUDY POPULATION:**Selectedelectivepediatricpatients that undergo surgeries at TASHwithin specified time period.

4.5.**EXCLUSION CRITERIA**: Patients with fever, preoperative hypothermic, anesthesia time less than 30 minutes and those patients that bypass recovery and pediatric patients whose parents are not available to sign the consent at the time of data collection were excluded from this study.

4.6.**SAMPLING AND SAMPLE SIZE DETERMINATION**:

All consecutive elective pediatric patients who were scheduled for surgery at TASH within specified time period were included so that there was no any sampling technique used.

4.7.**VARIABLES OF THE STUDY**:

4.7.1. **Dependent variable.** Intraoperative and postoperative hypothermia.

4.7.2. **Independent variables**

Socio-demographic variables: age, sex, weight, Residence, Educational status, Occupation, Height

Preoperative clinical condition of the respondents: ASA status, coexisting diseases, body surface area
Intraoperative related factors: like type of surgery, type of anesthesia, duration of surgery, duration of anesthesia, amount of blood loss, operation room temperature, amount of intravenous fluid administered, blood transfusion and induction agents used.

4.8.**DATA COLLECTION TOOLS**:

The structured questioner was filled by trained data collectors (2 BSC anesthetists). The data collectors were assign one for elective pediatric procedures and one for elective orthopedic procedures including Urology, thoracic procedures. The questioner was prepared in English.

4.9.BODY TEMPRATURE MEASURMENT:

Body temperature was taken preoperatively, intra operatively and post operatively. The intra operative temperature was taken before induction, immediately after induction and then every hour till the procedure was finished. The post-operative temperature was taken every hour up to 2 hours considering that patients stay in the post Anesthesia care unit 1-2-hour post operatively. This measurement was done using tympanic thermometer.

Tympanic membrane temperature monitoring is often the preferred method in the preoperative and perioperative areas. The tympanic membrane is close to the carotid artery and hypothalamus and is a noninvasive and accurate measure of core temperature (50).

4.9.**DATA ANALYSIS PROCEDURE**:

Data was entered into Epi info version 7 and exported to SPSS version 20 for analysis. Tables and figures were used to describe descriptive results. Binary Logistic regression was used to test each factor with the dependent variable, and variables with P value of <0.2 were carried to multi variant analysis. 95% C.I. and P value of <0.05 was used as a cutoff point to test for significance of associations.

4.10. DATA QUALITY CONTROL:

Data collectors were trained. Pre testing of questionnaires was done before the start of the actual data collection to check for validity of the questionnaires' and feasibility of the method. Close supervision was done during data collection. Each Questionnaire was checked for errors before entry. Double entry was done on epi info version 7 on 10% of sample size.

4.11**. ETHICAL CONSIDERATION**

After approval of proposal, ethical clearance was obtained from ethical review committee, Anesthesia department, Addis Ababa University. Permission to conduct research was obtained from Tikur Anbessa Specialized Hospital. Informed verbal consent was obtained from every study participant. Confidentiality of information was ensured.

4.12. OPERATIONAL DEFINITIONS:

Minor surgery: is any invasive operative procedure in which only skin or mucus membranes and connective tissue is resected e.g. vascular cut down for catheter placement, implanting pumps in subcutaneous tissue, Breast biopsy…etc.

Moderate surgery: - Any invasive procedure which involves removal of skin and subcutaneous lesions. The expected blood loss is <10% of total blood volume. Examples include, Cystoscopy, vasectomy, Fiber optic bronchoscopy, Diagnostic laparoscopy, dilatation and curettage, arthroscopy, Inguinal hernia repair, Laparoscopic lysis of adhesion…etc.

Major Surgery: - These are procedures with expected blood loss of 10%-30% of total blood volume, includes invasive procedures such as, Open thoracic or intracranial procedure, thyroidectomy, Hysterectomy, major vascular repair (e.g., aorta- femoral bypass) …etc.

Normothermia: A core temperature range of 36°C to 38°C (96.8°F to 100.4°F)

Hypothermia: A core temperature less than 36°C (96.8°F)

Hyperthermia: A core temperature greater than 38°C (100.4°F)

CHAPTER FIVE

5. RESULT

Personal and socio-demographic characteristics

Data was collected from 92surgical pediatric patients. Two pediatrics patients were excluded because they had elevated body temperature during procedure. The mean age of participants was 5.63 years with standard deviation of 4.40, minimum age was 26 days and maximum age was 14 years old. The proportion of male participants was 71.1 %(n=64). Majority of participants were American society of Anesthesiologists' class I (ASAI) (93.3%). Six (6.7%) of participants had co morbidity. The leading co morbidity was malnutrition (66.7%). The mean operation room temperature was 21.42°C with standard deviation of 1.87.

Of the total 90 cases, the highest number of cases 40%(n=36) were belonged to the age group of 6 –12 years old followed by age group between 2-5 year, (31%). And more than half of the respondents were urban residence 63.3%(n=66). None of them preoperative hypothermia. Table 1 illustrate these and additional information.

Variables	Category	Frequency	Percentage
		Frequency	Percent
Age distribution of respondent	Neonate (0-30 days)	1	1.1
	Infant(1-12 months)	16	17.8
	Toddler(2-5 years)	31	34.4
	Children(6-12)years	36	40.0
	Adolescent t(13-18 years)	6	6.7
	Total	90	100.0
sex distribution of respondent	Male	64	71.1
	Female	26	28.9
	Total	90	100.0
religion of respondent	Orthodox	55	61.1
	Protestant	12	13.3
	Muslim	19	21.1

	Others	4	4.4
	Total	90	100.0
ethnicity of respondent	Oromo	40	44.4
	Amhara	31	34.4
	Tiger	6	6.7
	Others	13	14.4
	Total	90	100.0
residence of respondent	Urban	66	73.3
	Rural	24	26.7
	Total	90	100.0

Table: - 1 Personal and socio-demographic characteristics pediatric surgical patients at TikurAnbessa Specialized Hospital January-March 2016 G.C

Preoperative clinical condition of the respondents

Majority of respondents were free of coexisting diseases 93.3%(n=84) while 6.7% of cases were associated with other diseases. Most of the respondents were grouped asASA classIand the least of them were grouped under ASA III. Of all the respondent 67.8%(n=61) operated at morning time.More than half procedures were pediatric surgical cases follow by Orthopedic, Urologic, cardiothoracic procedures,as table 2 shows below.

Variables	Category	Frequency	Percent
any coexisting illness	Yes	6	6.7
	No	84	93.3
	Total	90	100.0
ASA status	ASA I	84	93.3
	ASA II	5	5.6
	ASA III	1	1.1
	Total	90	100.0
Body surface area	less than 0.5 m2 of BSA	22	24.4
	between 0.5 m2 and 1.00 m2 of BSA	51	56.7
	greater than 1 m2 of BSA	17	18.9
	Total	90	100.0
Time of arrival	Morning	61	67.8

	Afternoon	29	32.2
	Total	90	100.0
Surgical procedure	orthopedic procedures	30	33.3
	pediatrics procedures	48	53.3
	cardiothoracic procedures	4	4.4
	ENT procedures	1	1.1
	Urology procedures	6	6.7
	GIT procedures	1	1.1
	Total	90	100.0

- BSA=body surface area, GIT=gastrointestinal truck, ENT=ear nose throat, ASA=American society of anesthesiologist.

Table: - 2 Shows Preoperative clinical condition of the respondents or pediatric patients who underwent surgery in Black lion specialized hospital from January-March 2016 G.C.

Intraoperative events for respondents and frequency

Almost half of the procedures operated in OR temperature between 20-23 degree Celsius, as described in Table 3, major induction agent was propofol 43.3%(n=39) followed by combination of propofol and inhalational 35.6%(n=32) anesthetics. Thirty of all respondents had been given nerve block and most block was a caudal block 80%(n=24). Most of respondents were given cold (room temperature) iv fluid and a few of respondents were given warm fluid. More than half of the cases had been token 61-120 minutes.

Variables	Category	Frequency	percent
OR temperature	less than 20 ^{0}C of room temperature	23	25.6
	between 20-23 ^{0}C of room temperature	44	48.9
	greater than 23 ^{0}C	23	25.6
	Total	90	100.0
Induction agents	Inhalational	2	2.2
	propofol ,inhalational	32	35.6
	Ketamine	3	3.3
	propofop, ketamine	8	8.9
	Thiopantane	1	1.1
	thiopantone, ketamine	2	2.2
	Propofol	39	43.3

	Total	90	100.0
Muscle relaxants	Suxamitanium	53	82.8
	Vecronium	9	14.1
	Pacronium	1	1.6
	cis atracurium	1	1.6
	Total	64	100.0
Name of block	Caudal	24	80.0
	intercostal block	4	13.3
	axillary block	2	6.7
	Total	30	100.0
Analgesics used	Pethidine	41	83.7
	Morphine	1	2.0
	Tramadol	4	8.2
	pethidine, tramadol	1	2.0
	paracetamol, diclofenac	1	2.0
	morphine, paracetamol	1	2.0
	Total	49	100.0
Total iv fluids used intraoperatively	less than or equal 9ml/kg	24	26.7
	10-19 ml/kg	21	23.3
	20-29 ml/kg	25	27.8
	greater or equal 30 ml/kg	20	22.2
	Total	90	100.0
Temperature of IV fluids	Room temperature	81	90.0
	warm fluid	9	10.0
	Total	90	100.0
Duration of surgery	less than 60 minute duration	3	3.3
	between 61-120 minutes duration	51	56.7
	between 121-180 minutes duration	33	36.7
	between 181-240 minutes duration	3	3.3
	Total	90	100.0
Duration of anesthesia	less than 60 minute duration	4	4.4
	between 61-120 minutes duration	42	46.7
	between 121-180 minutes duration	38	42.2
	between 181-240 minutes duration	6	6.7
	Total	90	100.0

IV=intervenes

Table: -3 Illustrate Intraoperative events for respondents or pediatric patients who underwent surgery in Black lion specialized hospital from January-March 2016 G.C.

Figure-1 shows the average intraoperative body temperature distribution which implied 71% hypothermia and 29% normothermia.

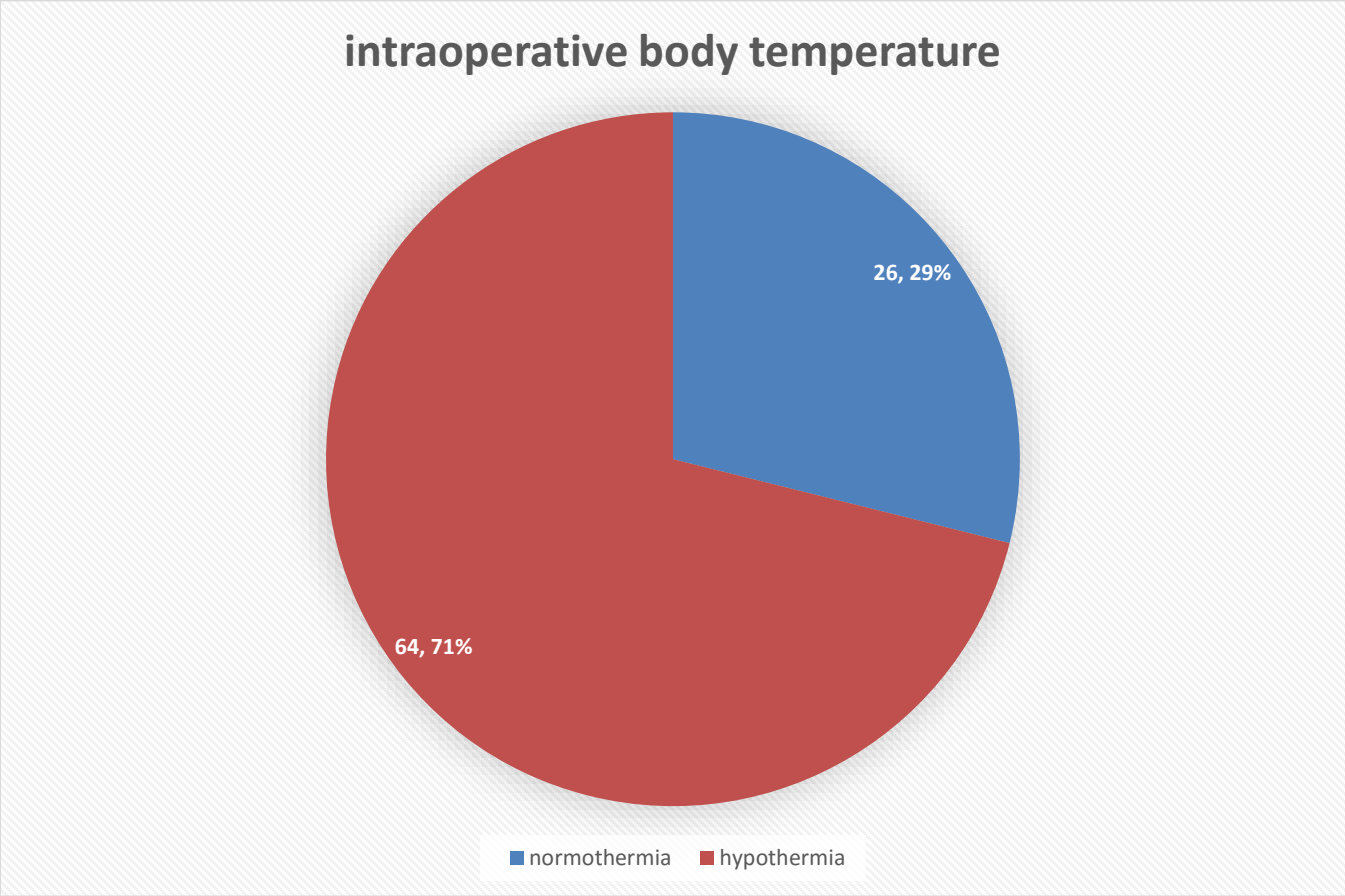


Figure: - 1 Distribution of averageintraoperative body temperature for pediatric patientswho underwent surgery in Black lion specialized hospital from January-March 2016 G.C.

As below diagram below illustrate, the frequency of postoperative hypothermia greater than intraoperative hypothermia in pediatric patients. Which implies 71% for average intraoperative and 79% for postoperative hypothermia.

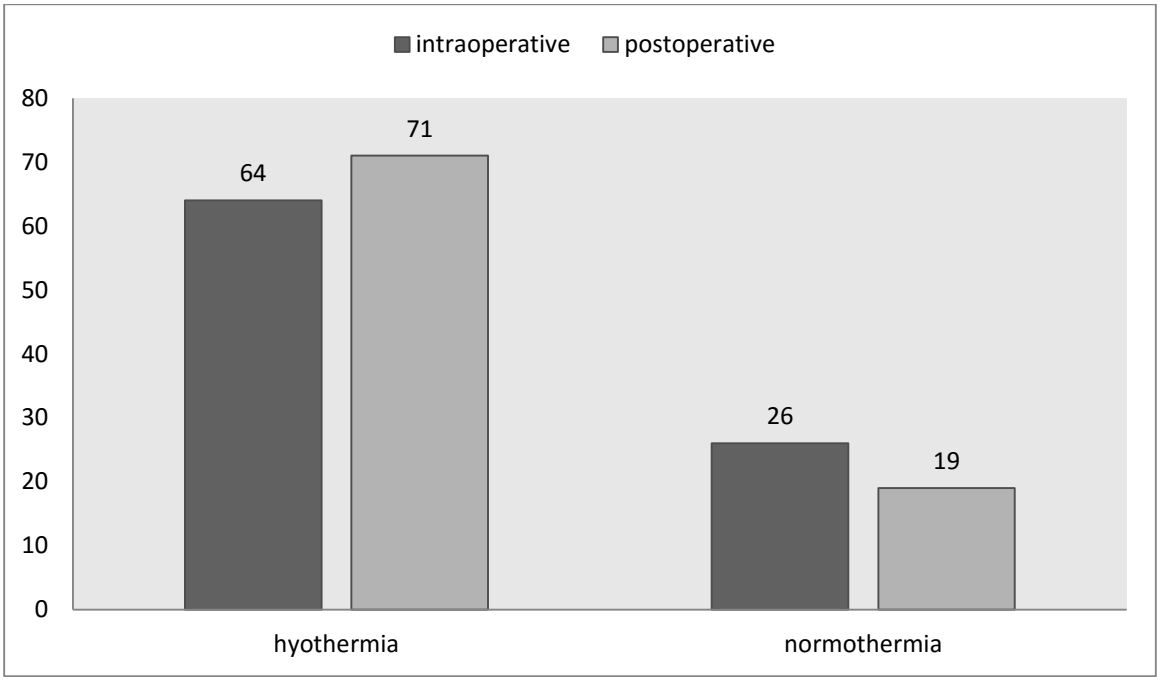


Figure: - 2 Illustrate distribution of intraoperative and postoperative body temperature for pediatric patients who underwent surgery in Black lion specialized hospital from January-March 2016 G.C.

Figure: - 3 Illustrate patients' body temperature from induction, hourly interval and postoperative. The diagram implied that just after induction incidence of hypothermia 72.2%, after an hour of induction 64.4%, after couple of hours again raised to 83.8% and after third hours there were three cases but all had been hypothermic. Addition to that the figure replied postoperative incidence of hypothermia 78.9% of all pediatric patients.

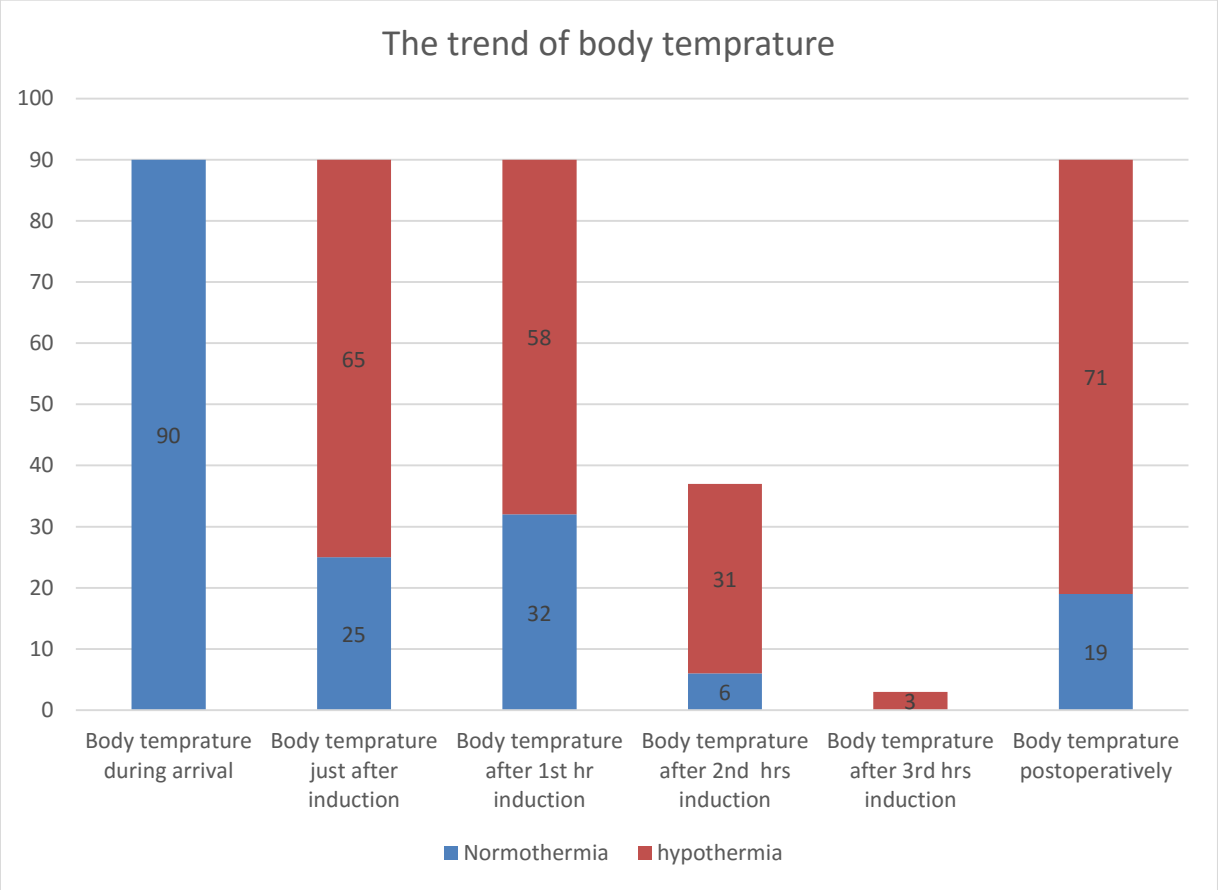


Figure: - 3 Illustrate the trend of intraoperative and postoperative body temperature for pediatric patients who underwent surgery in Black lion specialized hospital from January-March 2016 G.C

As multivariate association implied body surface area, total Iv fluid and OR temperature was strongly associated with intraoperatively hypothermia at p value less than 0.05. The odd of developing intraoperative hypothermia for urban resident was seven times as high as the odd of developing intraoperative hypothermia for rural resident (AOR; 7.168; C.I, 1.509-34.050).

Variables	Category	p-value	AOR	95% C. I .for EXP(B)	
				Lower	Upper
Body surface area	<0.5m^2	.693			
	0.5-1 m^2	.398	2.298	.334	15.816
	>1 m^2	.669	1.411	.291	6.842
Sex	Male	*	*	*	*
	Female	.607	1.448	.353	5.934
Residence	Urban	*	*	*	*
	Rural	.013	7.168	1.509	34.050
OR temperature	<20	.001	*	*	*
	21-23	.001	.011	.001	.145
	>23	.002	.095	.021	.431
Total iv fluids used intraoperatively	<9ml/kg	.133	*	*	*
	10-19ml/kg	.023	13.031	1.422	119.370
	20-29ml/kg	.034	11.631	1.200	112.784
	30-39ml/kg	.104	6.341	.682	58.963

Table: - 4 The association of variables to intraoperative hypothermia for pediatric patients who underwent surgery in Black lion specialized hospital from January-March 2016 G.C.

A data from multivariate analysis implied OR temperature was strongly associated with postoperatively hypothermia at p value less than 0.05. The odd of developing postoperative hypothermia for body surface area0.5-1 $m^2$was twice as high as the odd of developing postoperative hypothermia for body surface area <0.5m^2 (AOR; 1.915; C.I, .296-12.387). The odd of developing postoperative hypothermia for average intraoperative hypothermia five times as high as the odd of developing postoperative hypothermia for intraoperative normothermia (AOR; 4.687; C. I, .824-26.670).As (table-5) Females were three times more vulnerable for postoperative hypothermia than male pediatric patients (AOR;3.001; C.I,.650-13.860).

Variables	Category	p-value	AOR	95% C. I. for EXP(B)	
				Lower	Upper
Body surface area	<0.5m^2	.603			
	0.5-1 m^2	.495	1.915	.296	12.387
	>1 m^2	.916	.920	.197	4.298
Sex	Male	*	*	*	*
	Female	.159	3.001	.650	13.860
Residence	Urban	*	*	*	*
	Rural	.626	.671	.135	3.341
ORtemperature	<20^{0}C	.028	*	*	*
	21-23^{0}C	.033	.096	.011	.831
	>23^{0}C	.535	.556	.087	3.555
Totalivfluids	<9ml/kg	*	*	*	*
	10-19ml/kg	.142	4.226	.616	29.000
	20-29ml/kg	.269	2.703	.464	15.749
	30-39ml/kg	.214	2.864	.545	15.057
Average intraoperative body temperature	Normothermia	*	*	*	*
	Hypothermia	.082	4.687	.824	26.670

Table: - 5 Illustrate the association of variables topostoperative hypothermia for pediatric patients who underwent surgery in Black lion specialized hospital from January-March 2016 G.C

CHAPTER SIX: DISCUSSION

In this review, intraoperative hypothermia was assessed on pediatric surgical patients. The mean age of participants was 5.63 years with standard deviation of 4.40. It wasalso found that the incidence of intra and post-operative hypothermia was 71.1% and 78.9% respectively. Intra-operative hypothermia was observed in 64 (71.1%) patients with body temperature ranging from 34.18 to 35.9°C. This incidence is higher when compared with study conductedat Gondar University Hospital [5], where incidence of intra operative was 49.7%, but lower than in study conductedin Australia where the incidence was 74% [5, 41].

Similarly, another study showed that more than 50% of children experienced intraoperative hypothermia [34]. Furthermore, this study found that children who were operated at low ambient temperature were highly vulnerable to hypothermia than children who were operated in high ambient temperature which is consistent to a study conducted on intraoperative hypothermia and showed as operation room temperature was critical factor for intraoperative patient's body temperature [51].

Another study done in India in 2014 implied that, during pediatric anesthesia infants and small children are prone to perioperative hypothermia due to many inherent factors. This makes it mandatory to monitor their core temperature. Management should involve prevention and/or decreasing the risk by use of a multimodal approach. This includes preoperatively keeping the child warm, increasing ambient OR temperature to 23 0C-25 0C, use of warm intravenous fluids, passive insulation and use of forced air [warming devices [43].

According to the result of this study, total IV fluid used intraoperative was associated with intraoperative and postoperative hypothermia which is consistent other study [52]. A review of this study was also demonstrated that low operative room temperature was strongly associated with intraoperative hypothermia. Similarly, Intravenous fluid temperature was found to be associated with incidence of hypothermia in a prospective observational study conducted in 2012 by FrédéricLapostolle and colleagues among trauma victim patients. In this particular study, severity of injury and mobile unit temperature were also highly associated with perioperative hypothermia among trauma victims [46]

Perioperative core temperatures are modulated by changes in the internal distribution of body heat and by systemic heat balance. Heat balance is, in turn, largely determined by ambient exposure, which includes the effect of passive insulation [53] and active heating [54]. Core temperature in our hypovolemic patients increased, whereas temperature decreased in those who were given larger amounts of fluid. The magnitude or even direction of the changes would presumably vary in other environments. However, the relative effect of mild fluid deprivation is likely to be similar under other conditions.

In contrast to this study, intraoperative a study conducted on factors affecting perioperative hypothermia revealed that operative room temperature has no impact on intraoperative and postoperative [46] In other similar study conducted on Perioperative Hypothermia and Predictors of Intra-Operative Hypothermia showed that the mean temperature on arrival was 36.3 with standard deviation of 0.7. Incidence of hypothermia after induction was 23.4%. [5] In the present study, Incidence of hypothermia after induction was 72.2%. The likely cause of the difference may be due to temperature variation in different geographical area and intraoperative clothing style of the patient was different.

CHAPTER SEVEN: Conclusion and RECCOMENDATION

7.1 Conclusion

This study revealed a high incidence of inadvertent intraoperative and postoperative hypothermia in electivepediatric operated cases. A relatively high incidence of hypothermia was found in patients who operated in low ambient temperature.

Residence, OR temperature, total iv fluids used intraoperatively were strongly associated with intraoperative hypothermia.

Body surface area, sex, totalivfluids and average intraoperative body temperature were positive predictor of postoperative hypothermia.

7.2 RECCOMENDATION

Based on the finding of the study the following recommendations are drawn

- Anesthetist should warm Iv fluid before they infusion
- PACU team should monitor their patients body temperature as route standard when monitor the patients in recovery.
- Hospital administrative should adjust Operative room temperature between 23-25^{0}C
- Researcher were recommended to conduct further researchers using cohort study design.

REFERENCES

1. SukhminderJit Singh Bajwa. Perioperative hypothermia in pediatric patients. ANAESTH, PAIN & INTENSIVE CARE. 2014; 18(1):97-100.
2. Radauceanu DS, Dragnea D, Craig J. NICE guidelines for inadvertent peri-operative hypothermia.Anaesthesia. 2009; 64(12):1381–1382
3. Leslie K SD. Perioperative hypothermia in the high risk surgical patient. Clin Anaesthesiol. 2003;17(4):485-98.
4. System. SRAn. Pharmacology and physiology in anesthetic practice. 3rd edition ed. Philadelphia: Lippincott, Williams & Wilkins; 1999.
5. Zewditu A, Peter S, etal.Perioperative Hypothermia and Predictors of Intra-Operative Hypothermia.Anesthesia& clinical research.2015; 6(8) • 1000556
6. Kurz A. Physiology of thermoregulation. Best Pract Res Clin Anaesthesiol.2008;22(4):627-644
7. Sessler DI. Temperature regulation and monitoring. In: Miller RD,Eriksson LI, Fleisher LA, Wiener-Kronish JP, eds. Miller'sAnesthesia. 7th ed. Philadelphia: Churchill Livingstone/Elsevier,2010:1533-1536.
8. American Association of Blood Banks. Guidelines for the Use of Blood Warming Devices. 2006. www.aabb.org
9. Tony C. Welch, CRNA, MSNA. A Common Sense Approach to Hypothermia. Update for Nurse Anesthetists. June 2002, Vol. 70, No. 3
10. Bickler, P. Sessler, D.I., Efficacy of Airway Heat and Moisture Exchangers in Anesthetized Humans. Anesth. Analg. 71:1990, Pgs. 415-418.
11. Bernard SA GT, Buist MD, et al. Treatment of comatose survivors of out-of-hospitalcardiac arrest with induced hypothermia. N Engl J Med 2002;346(8):557–63.
12. Bondok RS. Hypothermia in trauma: fluid and blood warming. Ain Shams Journal of Anesthesiology. 2009;2.
13. Tsuei BJ KP. Hypothermia in the trauma patient. Injury. 2004;(35):7-15.
14. Frank S M, Beattie C, Christopherson R, Norris E J, Perler B A, Williams G M, Gottlieb S O. Unintentional hypothermia is associated with postoperative myocardial ischemia. Anesthesiology 1993; 78: 468}476

15. Frank SM, Cattaneo CG, Wieneke-Brady MB et al. Threshold for adrenomedullary activation and increased cardiac work during mild core hypothermia. Clinical Science (London) 2002; 102: 119–125
16. Ojas H, Mehta and Karea L. Barcla. Perioperative Hypothermia in patients undergoing major colorectal surgery.ANZ J Surg; 2014, 84: 550-555
17. Frank SM FL, Breslow MJ, Higgins MS, Olson KF, Kelly S, Beattie C. JAMA. 1997;277:1127-34.
18. Steven M. Frank, MD; Lee A. Fleisher, MD; Michael J. Breslow, MD; Michael S. Higgins, MD; Krista F. Olson; Susan Kelly, BSN; Charles Beattie, MD.Perioperative Maintenance of Normothermia Reduces the Incidence of Morbid Cardiac Events**.** *AMA.* 1997;277(14):1127-1134)
19. Ponniah Vanamoorthy MPP, Parmod K Bithal, Sebastian S Valiaveedan. . Refractory hypotension due to intraoperativehypothermia during spinal instrumentation. Indian Journal of Anaesthesia 2010;54(1).
20. Okauchi M KN, Nakamura T, Kawanishi M, Nagao S. . Effects of mild hypothermia and alkalizing agents on brain injuries in rats with acute subdural hematomas. . J Neurotrauma. 2002;19:741–51.
21. Polderman. KH. Hypothermia and coagulation. . Crit Care 2012;16(2).
22. Rajagopalan S, Mascha E, Na J, Sessler DI. The effects of mild perioperative hypothermia on blood loss and transfusion requirement. Anesthesiology. 2008;108(1):71–77
23. Suman Rajagopalan MD, * Edward Mascha, Ph.D.,† Jie Na, M.S.,‡ Daniel I. Sessler, M.D. The Effects of Mild Perioperative Hypothermia on Blood Loss and Transfusion Requirement. Anesthesiology. 2008;108:71–7.
24. Winkler M AO, Birkenberg B, et al. . Aggressive warming reduces blood loss during hiparthroplasty. Anesthesia and analgesia. 2000;91:978-84.
25. Johansson T LB, Ivarsson I. . Mild hypothermia does not increase blood loss during totalhip arthroplasty. Acta Anaesthesiol Scand 1999;43:1005-10.
26. Melling AC1 AB, Scott EM, Leaper DJ. Effects of preoperative warming on the incidence of wound infection after clean surgery: a randomised controlled trial. Lancet. 2002 Mar 9;359.
27. Seamon MJ1 WJ, Gaughan JP, Kulp H, Kamel I, Dempsey DT. The effects of intraoperative hypothermia on surgical site infection: an analysis of 524 trauma laparotomies. Ann Surg. 2012;255(4):789-95.
28. Flores-Maldonado A M-EC, Rios-Rodriguez HM, Fernandez-Dominguez. Mild perioperative hypothermia and the risk of wound infection. . Arch Med Res 2001;32:227–31.

29. Fritz HG BR, Walter B, Moertiz KU, Reinhart K. ffects of hypothermia (32uC) on plasma concentration of fentanyl in piglets. Anesthesiology. 1999;91(3A).
30. Heier T CJ, Sessler DI, Miller RD. Mild intraoperative hypothermia increases duration of action and spontaneous recovery of vecuronium blockade during nitrous oxideisoflurane anesthesia in humans. 1991;74(5):815-9.
31. Heier T CJ, Sharma ML, et al. Mild intraoperative hypothermia does not change the pharmacodynamics (concentration-effect relationship) of vecuronium in humans. Anesthesia and analgesia. 1994;78:973–7
32. Caldwell J E, Heier T, Wright P M, Lin S, McCarthy G, Szenohradszky J, Sharma M L, Hing J P, Schroeder M and Sessler D I: Temperature-dependent Pharmacokinetics andpharmacodynamics of Vecuronium. Anesthesiology 2000, 92:84-93
33. Anthony G. Doufas. Consequences of inadvertent perioperative hypothermia.Best Practice & Research Clinical Anaesthesiology 2003; 17 (4) : 535–549,
34. Pearce B, Christensen R, Voepel-Lewis T. Perioperative Hypothermia in the Pediatric Population: Prevalence, Risk Factors and Outcomes. J Anesthe Clinic Res.2010;1(1):1-4.
35. Charles J. *A Practice of Anesthesia forInfants and Children.*New York: Natasha Andjelkovic ,2009,4th ed.
36. L. Longo, L. Kasper, J. Larry Jameson et al.*Harrison's Principles of Internal Medicine.*USA: The McGraw-Hill Companies, Inc, 2012, 18thed.
37. T. Kasai, M. Hirose, K. Yaegashi, et al.Preoperative Risk Factors of Intraoperative Hypothermia in Major Surgery Under General Anesthesia. AnesthAnalg. 2002;95:1381–3.
38. Kiekkas P KM. Prewarming: preventing intraoperative hypothermia. Br J Perioperative Nursing. 2005:444-51.
39. Siegel M N, Gravenstein N. Passive warming of airway gases (artificial nose) improves accuracy of Esophageal temperature monitoring. J clinicl monitoring. 1990; 6 (2): 89-92)
40. Lenhardt R. Monitoring and thermal management: Best Pract Res ClinAnaesthesiol2003 Dec;17(4):569-81
41. Muhammad Arshadetal.Frequency of Hypothermia during General AnaesthesiaPakistan Journal of Medical and Health Sciences. 2011; 5(3).

42. Salzberg Moore et al. **][**Susan Salzberg Moore, MD, a Carmen R. Green, MD, b Feng Lei Wang, MD," Sujit K. Pandit, MD, b and William W. Hurd, M])":The role of irrigation in the development of hypothermiaduring laparoscopic surgery.AmJObstet Gynecol. March 1997.
43. Alex Macario, , and Franklin Dexter, What are the Most Important Risk Factors for a Patient's Developing Intraoperative Hypothermia? AnesthAnalg2002;94:215–20.
44. TadesseBelayneh, AbebawGebeyehu and ZewdituAbdissa.Post-operative Hypothermia in Surgical Patients at University of Gondar Hospital.Anesthesia&ClinicalJAnesthClin Res.2014; 5:11
45. Clara Luís1, Carlos Moreno1, Acácio Silva1, Rosália Páscoa1, Fernando Abelha, Inadvertent Postoperative Hypothermia at Post-Anesthesia Care Unit: Incidence, Predictors and Outcome. Open Journal of Anesthesiology, 2012, 2, 205-213.
46. Frédéric Lapostolle1,2*, Jean Luc Sebbah3, James Couvreur4, François Xavier Koch5, Dominique Savary6,Karim Tazarourte7, Gerald Egman8, Lynda Mzabi1,2, Michel Galinski1,2 and Frédéric Adnet1,2: Risk factors for onset of hypothermia in trauma victims. Biomed central. Critical Care 2012, 16:R142
47. Salzberg Moore et al. **][**Susan Salzberg Moore, MD, a Carmen R. Green, MD, b Feng Lei Wang, MD," Sujit K. Pandit, MD, b and William W. Hurd, M])":The role of irrigation in the development of hypothermiaduring laparoscopic surgery.AmJObstet Gynecol. March 1997.
48. Vanessa de BritoPoveda[I]; Cristina Maria Galvão[II]; RosanaAparecidaSpadotiDantas[:] Intraoperative hypothermia in patients undergoing elective surgery.Actapaul. enferm. vol.22 no.4 São Paulo 2009
49. Noriyoshi Tanaka1#, Yuko Ohno1, Megumi Hori1, Mai Utada1, Kenji Ito2, Toshiyasu Suzuki2. High Preoperative Anxiety Level and the Risk of Intraoperative Hypothermia: International Journal of Clinical Medicine, 2012, 3, 461-468.
50. Lenhardt R. Monitoring and thermal management: Best Pract Res ClinAnaesthesiol2003 Dec;17(4):569-81.
51. Leben J[1], Tryba M, Kurz-Müller K, Schregel W.Prevention of intraoperative hypothermia in children. 1998 Jun;47(6):475-8.
52. Jie Yi1☯, Ziyong Xiang2☯, Xiaoming Deng3 et al. Incidence of Inadvertent Intraoperative Hypothermia and Its Risk Factors in Patients Undergoing General Anesthesia . pone2015 Sep;1371(10.):0136136

53. Sessler DI, Schroeder M: Heat loss in humans covered with cotton hospital blankets. AnesthAnalg993; 77:73–7
54. Greif R, Rajek A, Laciny S, Bastanmehr H, Sessler D: Resistive heating is a more effective treatment for accidental hypothermia than metallic-foil insulation. Ann Emerg Med 2000; 35:337–45

ASSURANCE OF PRINCIPAL INVESTIGATOR

The undersigned agrees to accept responsibility for the scientific ethical conduct of the research project and for provision of required progress reports as:

Per terms and conditions of the research publications office in effect at the time of Grant is forwarded as the result of this application.

Name of the student: MulatMossie (BSc, MSc student in Anesthesia)

Date: 03/6/2016 G.C

Signature: _____

Approval of the primary advisor:

Name of the primary advisor: Mr.WesenyelehAdmasu (BSc, MSc)

Date: _____

Signature:_____

ANNEXES:

Questionnaire

Instruction: For each of the questions, please circle the number of alternative(s) that fit the response or fill the blank space provided.

Questionnaire code _____ Date_____ Starting time _____

Section I: Questions about the Sociodemographic and clinical background of the respondents:

S. No	Questions	Answer	If No, Skip to
101	Age	_____yrs	
102	Sex	1. Male 2. Female	
103	Religion	1. Orthodox 2. Protestant 3. Muslim 4. Others	
104	Ethnicity	1. Oromo 2. Amhara 3. Tigre 4. Others,specify…….	
105	Residence	1. Urban 2. Rural	
106	Educational status	1. Unable to read & write 2. Read and write only 3. Primary school 4. Secondary school 5. Not applicable	
107	Occupation	1. Farmer 2. Governmental employee 3. Merchant 4. Student 5. Others	

Section II: Questions about Pre-Operative Anesthetic Evaluation:

S. No	Questions	Answer	If No, Skip to
201	Type of surgery	1. Elective 2. Emergency	
202	Surgical procedure	1.----------	
203	Any co existing illness	1. Yes 2. No	
204	If yes; name of the disease	----------	
205	ASA status	1. ASA I 2. ASA II 3. ASA III 4. ASA IV	
206	Weight	----------Kg	
207	Height	----------M	
208	On any medication	1. Yes 2. No	
	Base line BP HR Temperature RR	_____ mmHG ----------beat/m ----------^{0}C --------breath/m	

Section III: Questions about intra operative medication and events:

S. No	Questions	Answer	If No, Skip to
301	Body temperature on arrival to OR Time of arrival---------- After induction ---------- After 1 hour of procedure -- After 2 hours of surgery ---- After 3 hours of surgery----- After 4 hours of surgery----------	---------^{0}C	
302	OR temperature ----------	---------^{0}C	
303	Induction Agent	1. Ketamine 2. Thiopental 3. Propofol 4. Inhalational(hal,Isofl,sevo)*underline one* 5. Fentanyl	
304	Muscle relaxant	1. Suxamethonium 2. Vecuronium 3. Pancuronium 4. Atracurarium	
305	Analgesics	----------	
306	Type of Local Ans.if spinal	1. Bupivacaine 2. Lidocaine	
307	Name of block if any	----------	
308	Volume of LA for block	----------ml	
309	Temperature of IV fluids	----------^{O}C	
310	Total IV fluids used intra operatively	---------ml	
311	Duration of Surgery	---------minutes	
312	Duration of Anesthesia	---------minutes	

313	**Intra operative blood loss**	**----------ml**	
314	**Transfusion**	**1. Yes** **2. No**	
315	**If yes, how many units?**	**----------**	
316	**Urine out put**	**--------ml**	
317	**Monitors used**	**1. Pulse oxymetry** **2. Capnography** **3. NIBP** **4. ECG** **5. Thermometer**	
318	**Intraoperative complication if any**	**----------**	

Section IV: Questions on post-operative conditions:

S. No	Questions	Answer	If No, Skip to
401	**Body temperature**	**1st. Record …….0C** **2nd.Record …… ″ ″** **3rd. Record …… .″ ″**	
402	**Shivering**	**1. Yes** **2. No**	
	BP **HR** **Temperature** **RR**	**_____ mmHG** **----------/m** **----------^{0}C** **--------/m**	

INFORMATION SHEET AND CONSENT FORM:

Title of the Research Project:

Intraoperative and postoperative hypothermia and associated factors, in elective surgical pediatric patientsfrom January to March, 2016 in TikurAnbessaSpecialized hospital, Ethiopia.

Name of the principal investigator: MulatMossie

Name of the organization: AddisAbaba University, school of medicine, department of anesthesia.

Name of the sponsor: AddisAbaba University.

Introduction

This information was prepared with the aim of assessing the magnitude and associated risk factors of Intraoperative and postoperative hypothermia in TASH. The research group includes the principal investigator, two data collectors, and one advisor from AAU.

Purpose of the Research project

The aim/goal of this study was to determine the magnitude and the risk factors for intraoperative and postoperative hypothermia during pediatric surgery at TASH. The finding of this study is expected to be used by decision makers, MOH, EAA, Pediatric surgery department, department of anesthesia and health practitioners of the University to change modifiable factors.

Procedure

This study wasincluding all elective pediatric patients coming for operation cases during the study period. They were selected as part of the study participants whowere willing to participate in this study and willing to have consent. No one was refused to participate during study pried.

Benefits, Risk or Discomfort

There was no direct benefit to study participants, but there was close monitoring and follow up. And the result of this study used for further improvement of the service.There was no risk of participating in this study.

Confidentiality: The information collected from the study subjects was kept confidential and stored in the file, without their name by assigning a code number to each.

Right to refusal or withdraw

Study subjects washave full right to refuse from participating in this research.

Person to contact

For any questions or concerns you can contact the principal investigator using the following addresses:

Name: MulatMossie

Phone: +251910469914

E-mail: mm469914@gmail.com

STUDY SUBJECTS CONSENT FORM

Consent form

Hello! My name is _____ I am of the members of the research team and I am here to ask you some questions and to collect some important information from your chart. Your name will not be listed out, that means your confidentiality will be kept. If you are willing to participate in this research on the assessment of magnitude and risk factors for perioperative hypothermia, which I will appreciate the contribution you will made to this research. So I would like to ask you, if you are willing to participate in this research.
I understood about the objectives of the research and the roles I will have in the research. I have agreed to participate in the research.

B. Agree **B**. Disagree

- ✓ If Respondent agrees to be interviewed, the interview will be started.