Effectiveness of Protocol on Prevention and Management of Post Operative Hypothermia.

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ABSTRACT

Background: The goal of preventing hypothermia is to minimize heat loss by decreasing radiation and convection from the skin, evaporation from the exposed surgical site and cooling due to cold intravenous fluids and also reduce the complications for good prognosis and speedy recovery. **Objective:** Objective of this study was to assess effectiveness of protocol on post operative hypothermia. **Method:** a hospital based qualitative interventional study was undertaken. All the postoperative patients (N=250) that underwent anaesthesia were included. The body temperature was measured pre, intra and post operatively of patient. Analysis was done using the software SPSS version 26.00. **Results:** Total 250 post operative patients were included in the study. Almost 98.4% of patients had post operative hypothermia they were having shivering and lack of coordination factors present. 99% of patients were normothermic and conscious in pre operative phase, 99% patients required passive warming in intraoperative phase and about 63% of patient had given warmed I.V Fluids to prevent hypothermia in post operative period. **Conclusion:** Post operative hypothermia in surgical patients is a common but preventable complication. But the knowledge and skills of the peri operative nurses can help to reduce or prevent the occurrence of post operative hypothermia.

Keywords: Hypothermia, Temperature, peri-operative, recovery room (PACU), ICU.

1. Introduction

Perioperative hypothermia, which is common during major surgery, may promote surgical-wound infection by triggering thermoregulatory vasoconstriction, which decreases subcutaneous oxygen tension. Reduced levels of oxygen in tissue impair oxidative killing by neutrophils and decrease the strength of the healing wound by reducing the deposition of collagen. Hypothermia also directly impairs immune system function. Hypothermia both increases susceptibility to surgical-wound infection and stay of hospitalization.[1]The goal of preventing hypothermia is to minimize heat loss by decreasing radiation and convection from the skin, evaporation from the exposed surgical site and cooling due to cold intravenous fluids and also reduce the complications for good prognosis and speedy recovery.[2]

2. Methods

After institutional ethical approval the present study was started. Qualitative interventional study was conducted from April 2021 to April 2022.The study was conducted at tertiary care hospital, Karad, Maharashtra and the areas was Recovery Room, Surgical ICU and Surgery wards. Post operative patients who were above 18 years and operated under anaesthesia at tertiary care hospital, Karad, Maharashtra.

Inclusion criteria

A post operative patient whose age is > 18 years, who's underwent surgery with anaesthesia; those are willing and available at the time of data collection.

Exclusion criteria

Patients who are having mental illness, Burn patient and Cardiac surgery patients were excluded.

Independent variables

The independent variables were post operative patients.

Dependent variables

The protocol for prevention and management for the post operative patients.

Analysis

Data was analyzed by with the objectives of the study by using descriptive. The data were entered

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in excel sheet and clean up then by using software SPSS version 26.00 analysis was done.

3. Results

Table 1: Distribution of frequencies in Preoperative management phase. (N=100)			
Sr. No	Contents	Frequency	
		Yes	No
1.	Hypothermia (below 36.1°C or 97 °F)	1	99
2.	Shivering	1	99
3.	Slurred speech	12	88
4.	Shallow breathings	8	92
5.	Weak pulse	21	79
6.	Lack of co ordination	87	13
7.	Drowsiness	90	10
8.	Confusion or loss of memory	42	58
9.	Loss of consciousness	2	98
10.	Patient is having any illness or co morbidity.	37	63

Above table reveals that, out of 100 patients the 99 (99%) patients were not having hypothermia whereas 1(1%) patients was having hypothermia, 99 (99%) patients were not having Shivering whereas 1(1%) patients was having Shivering, 88 (88%) patients were not having Slurred speech whereas 12(12%) patients was having Slurred speech, 92 (92%) patients were not having Shallow breathings whereas 8(8%) patients was having Shallow breathing, 79 (79%) patients were not having Weak pulse whereas 21(21%) patients was having Weak pulse,13 (13%) patients were not having Lack of co ordination whereas 87(87%) patients was having Lack of co ordination,10 (10%) patients were not having Drowsiness whereas 90(90%) patients was having Drowsiness, 58 (58%) patients were not having Confusion or loss of memory whereas 42(42%) patients was having Confusion or loss of memory, 98 (98%) patients were not having Loss of consciousness whereas 2(2%) patients was having Loss of consciousness, 63 (63%) patients were not having any illness or co morbidity whereas 37(37%) patients was having is illness or co morbidity. Out of 100 patients in pre operative phase risk factors like shivering, slurred speech, shallow breathing, weak pulse, lack of co ordination, drowsiness, confusion or memory loss, loss of consciousness and illness or co morbidity was not found in 24 (24%) patients whereas lack of co ordination and drowsiness was in 76 (76%) patients. Lack of co ordination was found in 87 (87%) whereas not found in 13 (13%).

Explained surgical procedure to the all patients, to reduce the fear and anxiety of hospitalization, procedure as well as gives the positive approach towards the prognosis of treatment. This was done by the nurse at before the surgical procedure in recovery room to reduce the risk of hypothermia.

Table 2: Distribution of frequencies in Intra operative management phase. (N=100)			
Sr. No	Contents	Frequency	
		Yes	No
1.	Active warming	1	99
2.	Passive warming	99	1

Above table reveals that, out of 100 patients, the 99 (99%) patients were not given active warming methods whereas 1(1%) patients was given active warming, active warming includes the radiant heater, warming pads, hot water bag and 99 (99%) patients were given passive warming methods, this includes the warmed liquids and fluids, socks, increased cloths, blankets and warmed environment or room temperature. Whereas 1(1%) patient was not given passive warming methods.

Intra operative management was done by nurse at the operating room during the surgery. For the all patients frequently monitored temperature at every 10 minutes and maintained the operating room temperature at or above 75°C. Also the minimum exposure of skin carried throughout the surgery. When duration of anesthesia was more than 30 minutes or the signs of hypothermia are present then provided active or passive warming methods.

Table 3: Distribution of frequencies in Post Operative management phase. (N=100)			
Sr. No	Contents	Frequency	
		Yes	No
1.	Body temperature normal	35	65
2.	Passive warming methods	97	3
3.	Warmed I.V fluids	63	37

Above table reveals that, out of 100 patients, the 65 (65%) patients were body temperature was not normal because there is not much effect occurs of intra operative period interventions, whereas 35(35%) patients were body temperature was normal means the intra-operative interventions were effective.3 (3%) patients were not given the Passive warming methods because the body temperature of these patients was normal in the post operative period. whereas 97(97%) patients were given the Passive warming methods like warmed liquids and fluids, socks and increased

cloths, blankets and warmed environment or the room temperature.63 (63%) patients were not given Warmed I.V fluids because already interventions of pre operative and intra operative was effective in prevention of post operative hypothermia, whereas 37(37%) patients were given Warmed I.V fluids in the post operative phase and then up to 30 minutes assessment of body temperature and after interventions all the remaining patients was normal body temperature.

To maintain normal body temperature after the post operative period instructions given to the patient and relatives to use the warmed liquids and fluids, socks and increased cloths, blankets and warmed room temperature. It reveals that the protocol was succeeds in prevention and management of post operative hypothermia.

4. Discussion

A) Preoperative management

This was the first stage of the protocol checklist for prevention and management of post operative hypothermia. In this stage assessment of patient done by nurse at before the surgery in the recovery room or pre anesthetic care unit.

In the present study only 1% of samples were had hypothermia and shivering in the pre operative phase but inconsistent results found in the study conducted by Fatma Vural et al. the incidence of pre operative hypothermia was reported to be 4% in the study by Horn et al. and 2.40% observed in the study by Can Aksu et al.

The patients in recovery or pre anesthetic care unit or waiting room usually lie on the stretchers for the hours without any warming strategy it might contribute to the hypothermia.

In the present study, majority of samples were not having hypothermia in pre operative phase but among them 12% samples had slurred speech, 8% samples had shallow breathing and 21% of samples had weak pulse observed in the study. No any evidence of literature observed regarding this factors in the pre operative phase.

In the present study, majority of samples observed lack of coordination 87% and drowsiness 90% whereas 42% samples had had confusion or loss of memory symptoms. Majority of samples were conscious and only 2% samples were unconscious in the study.

In the present study, 37% of samples had illness or morbidity whereas 63% were not having illness among the total samples. Similar study results were found in the study conducted by, Mulualem S. Fekede et al. they observed that, 34% of samples were had co existing disease whereas 66% were not having illness or co existing disease.

B) Intra operative management

Intra operative stage starts from the patient goes to operation theatre for a surgical procedure and up to the completion of surgery. In the present study in this stage temperature assessment of patient and interventions were given by nurse at operation theatre or Operating Room during the surgery. Frequently monitored body temperature at every 10 min with digital thermometer by axillary method, minimum exposure of skin and operating room temperature was maintained at or above 75°F or 24°C.

In the present study majority 99% of total samples had given passive warming that was warmed liquids or IV Fluids, increased cloths and warmed environment or room temperature and only 1% of samples were given or required active warming that was hot water bag and warming pads. It reveals that the pre operative management was effective to prevent intra operative hypothermia. Similar study conducted by Fatma Vural et al. they revealed that temperature of operating room and pre operative body temperature affected the hypothermia. Another study conducted by Mulualem S. Fekede et al. they observed patients who were operated in operating room temperature less than 23°C or 75°F were more likely develop intra operative hypothermia. Study conducted by Frank SM et al. shows that typical OR ambient room temperature (20-30°C) an approximately 50% average incidence of hypothermia could occur.

C) Post operative management

After the completion of surgery the post operative management was started. It was observed that, pre operatively and intra operatively hypothermia prevented or managed the less efforts will take in maintaining body temperature in post operative period or stage.

In the present study, majority 97% patients were given passive warming whereas 3% had no hypothermia and majority 63% of patients were given warmed IV Fluids to maintain the body temperature at normal level. Whereas 37% patients were no hypothermia that means they were normal body temperature, it reveals that the effect of pre and intra operative assessment and interventions has succeeds in those patients before the hypothermia arise in post operatively. Studies largely agreed that, administration of cold fluids were associated with development of peri-operative hypothermia.

Warming measures without temperature monitoring fails to reduce the presence of hypothermia contrary to what may be expected. That means the peri-operative body temperature affects post operative body temperature, so that temperature monitoring in every stage is very important. The incidence of post operative hypothermia was reported to be 13.50% in a study performed in Australia. , 32% in a study conducted in Portugal and 47.50% in a study conducted in Turkey.

Limitation of study

This study includes only post operative patients above 18 years. The other limitation of this study was lack of generalizability due to limited period

and sample size.

5. Conclusions

Post operative hypothermia in surgical patients is a common but preventable complication. But the knowledge and skills of the peri operative nurses can help to reduce or prevent the occurrence of post operative hypothermia. 99% of patients were normothermic and conscious in pre operative phase, 99% patients required passive warming in intraoperative phase and about 63% of patient had given warmed I.V Fluids to prevent hypothermia in post operative period.

Ethical Approval

Ethical approval was obtained from ethical institutional committee of KIMSDU, Karad on 1 December 2020 and approval number was KIMSDU/IEC/01/2020.

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