

EVIDENCE-BASED APPROACHES in CHILDREN with HYPOTHERMIA

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ABSTRACT

Pediatric hypothermia can be a condition that needs to be prevented. Today although there are various methods to prevent hypothermia, the hypothermia lists of the guidelines of the evidence guides in preventing and managing hypothermia. Will address the return to success and recovery by achieving vision incidence. We believe that this review will create a common approach since it does not follow a multidisciplinary approach. This to study is with current reviews, maintenance of normothermia in pediatric patients risk factors for hypothermia, and to discuss evidence-based hypothermia management aims.

Keywords: Undesirable hypothermia, pediatrics, evidence, thermoregulation, heat management

with the spread of microbes throughout the body and drug intoxications [4].

Perioperative hypothermia surgery in adult patients, has been identified as a cause of negative consequences. Perioperative hypothermia, hospitalization prolonging the duration, increasing health expenses, increased need for transfusion, surgical site infection increases the risk and mortality. Mortality increases 4 times in adult patients with hypothermia, complication rates such as sepsis and myocardial infarction reported to have doubled. Pediatric patients are more likely to experience unwanted hypothermia than adults during surgical interventions are known to be at risk. In pediatric patients. Although studies showing the frequency of hypothermia are limited, it is reported that it varies between 4.2% and 60%. Pediatric patients are referred to adults due to reasons such as decreased weight-body surface area ratio, increased heat loss from the head, insufficient subcutaneous adipose tissue. Rates in the perioperative period (core temperature $\leq 36^{\circ}\text{C}$). They tend to develop higher hypothermia. With this anesthesia induction during co-operative interventions. It is an important risk factor for hypothermia. Perioperative anesthetics used in the period inhibit thermogenesis, vasodilation and muscle relaxation occur. It prepares the ground for the formation of hypothermia. Also, during the perioperative period, the child is exposed to cold operating room, non-warming intravenous fluids and the amount of heat lost by potential evaporation in the environment increasing the development of unwanted hypothermia. In the study of Pearce et al., 278 (52%) of 530 patients examined had intraoperative hypothermia. In the same study, in children, internal invasive intervention, age, prolongation of anesthesia duration, blood hypothermia in cases of loss and blood transfusion residue is indicated [5,6,7].

INTRODUCTION

WHAT IS FEVER?

It is a condition that occurs due to non-infectious causes such as fever, infectious diseases, neoplasms, collagen tissue diseases and drugs. Non-infectious diseases such as fever, neoplasms other than infectious diseases, collagen tissue diseases and drugs. It may occur depending on the reasons. Pathogen entering the body in the pathogenesis of fever due to infectious causes or the release of pyrogen cytokines from peripheral mononuclear phagocytes activated by their products (e.g. bacterial endotoxic lipo-polysaccharides) (tumor necrosis factor, TNF- α ; interleukin-1 β , IL-1 β and IL-6) leading the way [1].

WHAT IS HYPOTHERMIA?

Hypothermia is a decrease in central body temperature 35°C below. Hypothermia means 35°C of central body temperature is falling under. However standard temperature values below 35°C with thermometers impossible to measure [2,3]. Hypothermia in cold weather is most common in children and the elderly. Other causes of hypothermia are brain diseases such as head trauma, brain tumors, stroke, underactive thyroid gland, low blood sugar, low functioning of the adrenal gland, hormonal diseases such as diabetes coma, serious inflammatory diseases

Symptoms of Hypothermia

- Deceleration in body movements and coordination
- Awkwardness
- Dizziness
- Numbness
- Indifference to the environment
- Slow heart rate
- Slow breathing
- Confusion or loss of consciousness[8,9,10]

Table 1: Physiological Effects of Hypothermia.

Metabolic: Shivering in the postoperative period increases body oxygen consumption by 40%.
Respiration: Reduces ventilator response to carbon dioxide. Each degree of cold reduces the oxygen solubility (amount of dissolved O ₂) in the blood. It reduces the oxygen affinity of hemoglobins.
Adrenergic: Activation of the sympathetic nervous system increases the release of norepinephrine by 100% -500%. There is little or no adrenomedullary response (epinephrine and cortisol are unchanged).
Cardiovascular: Systemic and pulmonary vasoconstriction develops. Arterial blood pressure increases. The risk of ventricular arrhythmias increases. The risk of myocardial ischemia and cardiac mortality increases.
Coagulation: Platelet function is impaired. The function of coagulation factors is impaired. Fibrinolysis develops.
Immune system: The function of neutrophils and macrophages is impaired. The amount of oxygen in the tissues decreases. The risk of bacterial wound infection increases.
Pharmacokinetics: The effect of neuromuscular blockers is enhanced. The duration of action of neuromuscular blockers is prolonged. For inhaled anesthetics, the minimum alveolar concentration is reduced. Renal blood flow decreases. Liver functions are reduced.

Evidence-Based Practices in Children With Hypothermia

Passive Insulation: While cotton-wool blankets, stockings and headdresses are used in services and recovery units; surgical pads, metal-reinforced plastic ortular deamel operating rooms can be used. With passive insulation, heat loss can be reduced up to 30% [11].

Active Heating Techniques: Forced-air "(hot air blowing) systems, electrical covers (Resistive Systems), radiant heaters, intravenous fluid, blood, blood-product warmers, energy Pads, heat-moisture exchanger filters [12].

Hot air, one of the active heating methods, while blowing systems reduce heat loss by radiation, they also provide an increase in temperature through convection. Operation around 0.75 ° C / they can increase the hour. Special, suitable heating devices, recommended for use with blankets. Unwanted hypothermia detected during the operation period.

They are effective in warming patients actively. Of the device There are special equipment. For example, abdomen and lower chest and upper extremity in extremity surgery warming apparatus in all operations related to the head and face in operations related to body apparatus or upper extremity lower extremity apparatus can be used.

The second active heating method is resistive (electrical, carbon fiber, gel etc. covers) are systems. Some resistive systems may contain water or special gel. However, the liquid circulation in the blanket. Patient burns due to active warming. It is reported that it may be. Through the electric wires it is not suitable to use the covers. Carbon fiber control units in material produced resistive systems used with; heating blankets suitable size, shape of surgery such as chest arm blanket preferred according to. Resistive systems from the patient. It can be disinfected in patient passages a patient as effective as a hot air blown system [13].

From hypothermia warming of intravenous and irrigation fluids to protect. In researches made with the method; patients control body temperatures compared to groups; average within the first half an hour after induction 0.41 oC (medium level of evidence) and 0.51 oC more in the first hour found to be high medium level of evidence [14].

Table 2: Evidence-Based Studies on Methods for Preventing Hypothermia [15,16].

Writer	Study Type	Number of Cases	Method	Result
Lars Witt	Prospective multicenter observational study	190	Intraoperative Hot Air Blown System	Decrease in unwanted hypothermia
Wong	RCC	103	Preoperative period	Decrease in unwanted hypothermia Carbon Polymer Bed Reduced blood loss
Leeth	RCC	105	Postoperative period; Hot Air Blowing System	Body temperature is the same Increase in thermal comfort Cost reduction
De Witte	RCC	26	Preoperative period; Preoperative period; Carbonfiber Blanket Body temperature increase	Postoperative period; Postoperative period; Hot Air Blown System Body temperature is the same
Hooven	Cohort	149	Postoperative period; Hot Air Blowing System	An increase in body temperature

Evidence-Based Nursing Management of Unwanted Hypothermia

- Maintaining and maintaining normal body temperature,
- Prevention of hypothermia complications that can cause morbidity and mortality,
- It is important to ensure the comfort of surgical patients and to improve clinical results.
- Determining risk factors for hypothermia
- Measuring body temperature
- Determining the patient's thermal comfort
- Determining the signs and symptoms of hypothermia
- Determining the patient's risk factors for unwanted hypothermia
- Application of temperature monitoring
- Determining the signs and symptoms of hypothermia
- Determining the identified risk factors

- Determining the patient's risk factors for preoperative hypothermia
- Sharing and recording risk factors to be identified with the maintenance team
- Examination of body temperature in the separation unit
- Discharge Training [17,18].

Conclusion

Using evidence-based guidelines throughout the perioperative period, determination and application of appropriate heating methods according to body temperature, shortening the time to reach normal body temperature, It will positively affect the success of the surgical intervention and the healing process by reducing the frequency of complications caused by hypothermia. With studies to be done, in pediatric patients effective management of adverse perioperative hypothermia. It is recommended to determine the methods and practices.

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