Case Study Application of Warm Compresses to Reduce Hyperthermia in Children with Febrile Seizures

Wulan Pramadhani^{1,*}, Virisya Chumaerotusyifa²

^{1,2} Program Studi Keperawatan, Universitas Awal Bros, Indonesia

Abstract

Children are more susceptible to infectious diseases, which often cause high fever. When the fever experiences a continuous increase in temperature above $38^{\circ}C$, it will result in febrile seizures in children. Recurrent and untreated febrile seizures can have long-term impacts, such as neurological and behavioral disorders, and can increase the mortality rate in children. This research contributed to applying warm compresses to reduce hyperthermia. The research design uses a descriptive method with a case study approach with one research sample. This research uses a bleeding maintenance process approach starting from assessment, diagnosis, intervention, implementation, and evaluation. The research results showed a case study of a child patient with febrile seizures who had problems with hyperthermia on the first day. An assessment was carried out on the first day; the body temperature was measured at 38.50C (the skin looked reddish and felt warm), and I had one seizure. The interventions and implementation provided to children are based on SIKI standards (Indonesian Nursing Intervention Standards). The nursing implementation in this case study was planned to overcome the problem of hyperthermia by applying warm compresses. Warm compresses are applied for three days, lasting 30 minutes and 2 hours before administering the drug. Implementation was carried out on February 20–22, 2023. After hyperthermia management, temperature regulation, and warm compresses on the third day of evaluation, the results showed a temperature of 36.5 °C with no recurrent seizures occurring. The conclusion is that there is a significant change due to the effect of warm compresses on reducing body temperature in pediatric patients with hyperthermia in cases of febrile seizures.

Keywords: Children; Febrile Seizures; Hyperthermia; Warm Compresses

*) Corresponding author: Wulan Pramadhani E-mail: wulanpramadhani98@gmail.com

1. Introduction

Seizures are a neurological condition that most commonly affects children aged 6 months to 5 years. Frequent fever, which is brought on by illnesses in extracranial tissues including tonsillitis, acute otitis media, and bronchitis, can typically produce seizures. Aside from high fever, seizures can be caused by inflammatory illnesses of the brain's lining, brain tumors, trauma or a bump on the head, and electrolyte imbalances in the body. One of the earliest indications of brain tumor illness is seizures, which happen in 20–45% of patients (Nazarov, 2022).

The World Health Organization (WHO) said that, according to data from 2018, 216 thousand children globally perished, and over 21.65million experienced convulsions as a result of fever. Approximately 77% of them had a history of fever bouts, and they ranged in age from one month to eleven years (Apriliani, 2023). The incidence of febrile seizures in Indonesia was 14,252 children in 2019, according to a report by the Ministry of Health there.

Children are particularly vulnerable to infectious infections, which frequently result in elevated fever. A toddler's fever is common, and seizures in children known as febrile seizures occur as the temperature rises steadily. The body of a child cannot withstand an imbalance in body temperature that keeps rising, hence pediatric patients who have febrile seizures must receive intervention right away to lower body temperature (Namira & Seizure, 2022).

Patients who experience febrile seizures can be treated with drugs, non-pharmacology, or a combination of both. Action pharmacology is administering medication analgesic-antipyretic and anti-seizure.Meanwhile, non-action Pharmacological, namely additional measures in lowering the heat after administration of antipyretic drugs. Non-pharmacological actions include providing lots of drinks, are placed inside normal temperature room, use clothes that are not thick, and provide warm compress (Windawati & Alfiyanti, 2020). Non-pharmacological methods are necessary to ensure the efficacy of the therapy process and are an additional step to lower body temperature following medication administration. Non-pharmacological interventions can promote increased external evaporation to accelerate the body temperature. reduction of Non pharmacological interventions involve administering warm compresses with analgesicantipyretic and anti-seizure medications, wearing loose clothing, staying in a room with a comfortable temperature, encouraging adequate drinking, and using tepid sponges (Nurlaili et al., 2019)

One technique for lowering body temperature is the use of warm compresses. When the body reaches >38°C, which is the state of hyperthermia, warm compresses are applied. It has been demonstrated that using warm compresses can help children with high fevers in the hospital lower their body temperatures since they are exposed to a variety of infectious diseases.

Warm compresses are usually given for 30 minutes, with warm water temperature \pm 34°C-37°C. Applying a warm compress to parts of the body where there are large blood vessels is a way to stimulate the hypothalamus with the aim of accelerating a decrease in body temperature. Heat signals delivered by the blood to the hypothalamus stimulate the preoptic part of the hypothalamus and cause stimulation that triggers a response by the effector system. This response will result in the release of more heat from the body through two mechanisms, namely dilation of peripheral blood vessels and increased sweat production (Tri Guno Respati et al., 2022).

Regarding the Case Study: Warm Compresses to Treat Hyperthermia, (Tri Guno Respati et al., 2022) state that the assessment findings were collected over the course of three days at the onset of patient An.M stay who has a 38.6° C temperature. The information gathered regarding An.M temperature might then be used to address the hyperthermia nursing issue associated with the disease process on the third evaluation day. The patient appears calmer and less fussy, and An.M is 36.6° C.

Based on the phenomenon and description above, researchers are interested in providing intervention in the form of warm compresses to reduce the problem of hyperthermia in children with cases of febrile seizures at one of the hospitals in Riau Islands Province.

2. Method

This research is a type of descriptive research with a case study design, using the nursing process starting from assessment, nursing diagnosis, nursing intervention, nursing implementation, and nursing evaluation. The inclusion criteria in this study were children aged 1 year 5 months and who experienced febrile seizures. Exclusion criteria are children who do not have a history of febrile seizures. The number of samples in the case study is one person. This research has gone through an ethical test from the Ethics Committee of Awal Bros University with No 0196/UAB1.20/SR/KEPK/10.23 The action taken on pediatric patients is the administration of warm compresses which is a nonpharmacological intervention to reduce symptoms of hyperthermia. Warm compresses are applied for 3 days, every shift. Data collection uses a nursing care assessment format. This is done by compiling the results of nursing implementation.

Data analysis from this research consists of four steps: data collection, data verification, data processing, and concluding the research results. The ethics underlying this research consist of informed consent (parents' statement regarding their baby's willingness to be a respondent), anonymity (writing the baby's identity with initials), and confidentiality (the author maintains the confidentiality of all research data).

3. Results and Discussion

Nursing care for An. F was carried out from February 20–22, 2023. The nursing process begins with assessment, nursing diagnosis, intervention, implementation, and evaluation. The results of the nursing process are explained as follows:

1. Assessment

Based on the results of the assessment on February 20, 2023, subjective data was obtained. The patient's mother said that her child still had a fever; the fever had not decreased since the afternoon of February 18. There was no cough or runny nose, and he was accompanied by 1 seizure at home with a duration of ± 5 minutes before being taken to the emergency room. An objective result was found by An: F looks weak, the acral feels warm, the skin looks reddish, CRT is less than 2 seconds, a nasal oxygen cannula of 2 liters per minute has been installed since coming from the emergency room, vital signs RR: 25 x/minute, N: 104 x/minute, body temperature: 38.5 °C, and oxygen saturation: 97%.

2. Nursing Diagnosis

Based on the assessment data, the nursing problem that arises in patients is hyperthermia related to the disease process.

3. Nursing Intervention

The interventions carried out were hyperthermia management and temperature

regulation. Researchers also provided warm compresses. Hyperthermia management (I.15506) is identifying the cause of hyperthermia, monitoring body temperature, monitoring electrolyte levels, monitoring recurrent seizures, loosening clothing, providing sufficient oral fluids, providing oxygen if necessary, and collaborating with intravenous fluids and electrolytes. Temperature regulation (I.14578), namely monitoring body temperature and vital signs (respiratory frequency and pulse), monitoring skin color and temperature, increasing adequate nutritional intake, and collaborating with antipyretics.

The intervention in this case study focuses on one case of patient An. F and the nursing action plan, namely carrying out nursing care starting from assessments in the form of observations and interviews, physical examinations, diagnostic results reports, carrying out nursing interventions, implementation, evaluation using the SOAP method, and providing warm compresses to reduce body temperature.

4. Nursing Implementation

On February 20, 2023, at 10:00 WIB in the Anyelir room, the author carried out the orientation phase by introducing himself and asking for family approval for his willingness to be a respondent in applying warm compresses. After the family agreed, the author provided health education about giving warm compresses, the areas to be given warm compresses, the duration of the action, and the purpose of giving warm compresses.

Before implementing the warm compress, the author carried out an initial assessment first and obtained information from the patient's mother, who said that her child still had a fever; the fever had not decreased since the afternoon of February 18 and was accompanied by one seizure at home before being taken to the emergency room. An objective result was found. F looks weak, the acral feels warm, the skin looks reddish, CRT is less than 2 seconds, a nasal oxygen cannula of 2 liters per minute has been installed since coming from the emergency room, vital signs: RR: 25 x/minute, N: 104 x/minute, body temperature: 38.5 °C, and oxygen saturation: 97%.

Before carrying out the compress, the nurse washes her hands first, prepares warm water that has been placed in a basin, and provides a washcloth or small towel for compressing. After that, the tools are placed next to the patient's bed, then the nurse applies a compress to the patient's forehead or axillary area. Nurses also don't forget to educate families about changing the compress every 10 minutes.

Implementation carried out on February 21 for the problem of hyperthermia in An. F is monitoring vital signs at 12.00 WIB, body temperature is 37.8oC, RR: 20 x/minute, N: 110

x/minute, and oxygen saturation is 99%. The patient no longer has nasal cannula oxygen installed, but the acral still feels warm. The patient's mother said that her child's body still felt warm; he had not finished eating, but breast milk was still being provided. Patient An. F still looked fussy and only wanted to be hugged and carried by his mother, and every time the nurse approached the patient, he always cried. On the second day, warm compresses were applied to the patient again; however, due to the child's condition being still fussy, the compress was only applied for 10 minutes and continued if the child was cooperative.

On the 3rd day of implementation, February 22, at 15.00 WIB, vital signs were monitored again, and the family was advised to loosen their clothes, drink enough fluids, and give warm compresses if An. F still had a fever and his body temperature was high again. Subjective data obtained by the mother said that her child's fever had started to go down, as seen from the results of objective data, namely body temperature of 36.8 °C, RR of 22 x/minute, N of 112 x/minute, and oxygen saturation of 99%.

5. Nursing Evaluation

After carrying out nursing actions in accordance with the nursing interventions that have been designed for three days, an evaluation is then carried out using a method consisting of subjective (S), objective (O), assessment (A), and planning (P).

The evaluation will be carried out on February 20, 2023, at 13.00 WIB (S). The patient's mother said her child's fever was still fluctuating, and An. F still has difficulty sleeping and is fussy (O). After applying a warm compress for 30 minutes, vital signs showed a body temperature of 38.2 °C, RR: 24 x/minute, N: 118 x/minute, and oxygen saturation of 99%. The acral still feels warm, and the CRT is < 2 seconds. (A) The hyperthermia problem has not been resolved. (P) Treatment steps continue with intervention measures, namely giving warm compresses, collaborating with a doctor in administering antipyretic therapy, monitoring the occurrence of recurrent seizures, and monitoring vital signs. The evaluation will be carried out on February 21. 2023, at 13.00 WIB (S). The patient's mother said her child's fever was still fluctuating (O). After applying a warm compress for 30 minutes, vital signs showed a body temperature of 37.6 °C, RR: 22 x/minute, N: 134 x/minute, and oxygen saturation of 99%, and no recurrent seizures occurred. (A) The hyperthermia problem has not been resolved. (P) Treatment steps continue with intervention, namely giving a warm compress if An. F still has a fever, collaborating with the doctor in administering antipyretic therapy, and monitoring the patient's vital signs.

The evaluation was carried out on February 22, 2023, at 18.00 WIB (S). The patient's mother said her child's fever had started to go down, and An. F. can sleep soundly. (O) Vital signs showed a body temperature of 36.5 C, RR of 20 x/minute, N of 108 x/minute, and oxygen saturation of 99%, and no recurrent seizures occurred. (A) Hyperthermia problem resolved (P) Nursing intervention is stopped.

Based on evidence-based research, giving warm compresses to patients with hyperthermia can be a non-pharmacological action option to reduce body temperature and also provide comfort to children.

The main cause that often occurs in seizures is an increase in body temperature. Initial treatment for patients with febrile seizures is by managing body temperature in the nursing management process in the form of increasing fluid and nutritional intake according to needs, monitoring the balance of intake and output, monitoring body temperature, carrying out non-pharmacological measures such as warm compresses, and collaborating with doctors in administering therapy such as antipyretics (paracetamol).

A warm compress is an action that involves using a cloth or towel that has been soaked in warm water and placed on a certain part of the body. The warm compress procedure can be applied to areas such as the neck, axilla, groin crease, and inner knee crease (Nova, 2020). These areas were chosen because they contain large blood vessels, so they will help send signals more quickly to the part of the brain responsible for regulating body temperature (the hypothalamus). This action can be carried out by anyone because the equipment is economical and the method of implementation is simple and efficient.

Warm compresses, as a companion to pharmacological therapy, are useful in lowering body temperature. According to research (Windawati & Alfiyanti, 2020), the average result of a decrease in body temperature was 0.4 °C per day, and warm compresses were given in the study for 3 days. From this research, it can be concluded that applying warm compresses is an effective way to reduce body temperature in pediatric patients who experience hyperthermia with febrile seizures.

In line with case study research conducted by (Kusuma et al., 2023), implementation for three days and giving warm compresses showed that the problem of hyperthermia was resolved. The results obtained from the evaluation on the third day of the research are subjective data. The patient's mother said her child had no fever and could sleep soundly. Objective data shows a decrease in body temperature of 36.8 °C, the skin is not red, and there are no recurrent seizures.

Child nursing care is carried out using a family-centered care approach. where the youngster encounters the effects of hospitalization throughout treatment. research conducted by (Sudirman et al., 2023) explains that there are various factors that can influence success when carrying out nursing care, disturbances in comfort, and hyperthermia in febrile seizures. patients with including psychological conditions and existing stressors. Naturally, stressors that impede a child's recovery will arise while they are ill and must adjust to a hospital setting; therefore, the youngster truly needs the support of their family and the nurse.

As part of cooperative action, nurses can enhance the quality of nursing interventions by implementing family-centered care (Prasetia et al., 2022). Because the hospital is the primary source of healthcare services for the community, pediatric nurses play a crucial role in continuing to socialize the value of implementing family-centered care (Syarif et al., 2023).

6. Conclusions and Suggestions

Patients with nursing problems of febrile seizures with temperatures above the normal range with the main diagnosis being raised in this case being hyperthermia. Implementation is carried out by giving warm compress to treat and reduce body temperature in children in 3 days. Evaluation obtained on the patient for 3 days of treatment in problem children's inpatient room Hyperthermia disease resolved as indicated by a decrease in body temperature on the third day.

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