APPLICATION OF WARM ONION COMPRESS TO REDUCE FEVER IN CHILDREN AFTER DPT IMMUNIZATION IN PANCURAN GADING VILLAGE

Amanda Rahmayanti[1*], Gita Adelia[1], Yureya Nita[1], Nina Trisnawati[1]
[1]Payung Negeri Health Institute Pekanbaru, Faculty of Nursing, Professional Nurse Program, Pekanbaru, Indonesia
***Corresponding author: amandarahmayanti693@gmail.com**

Abstract

Fever is the most common Adverse Event Following Immunization (AEFI) in infants, particularly after the administration of the DPT vaccine. This condition can cause discomfort such as fussiness, restlessness, and disrupted activities; therefore, an effective and safe non-pharmacological intervention is needed. This study aims to determine the effect of warm red onion compresses on reducing body temperature in children experiencing fever after DPT immunization. The research design used a descriptive case study approach with two infant respondents who met the inclusion criteria: experiencing fever within the first 24 hours after immunization, not using antipyretics, and never having received warm red onion compress therapy before. The first respondent was a 4-month-old female infant with an initial temperature of 38.5°C, while the second respondent was a 3-month-old female infant with an initial temperature of 38.8°C. The nursing diagnosis for both respondents was hyperthermia related to inflammatory response due to immunization, characterized by increased body temperature, fussiness, and discomfort. The intervention was carried out using warm red onion compresses for 20–30 minutes, twice a day, for three days. The results showed a decrease in body temperature to 37.4°C in the first respondent and 37.5°C in the second respondent after the intervention, along with reduced fussiness and improved comfort. The findings indicate that warm red onion compresses are effective in reducing body temperature in children after DPT immunization and can serve as an alternative non-pharmacological therapy for managing AEFI. This method is also considered practical, safe, and applicable for families to use at home.

Keyword: Fever; Warm red onion compress; AEFI

INTRODUCTION

Immunization is a highly effective and essential public health effort to build active immunity in children, particularly against Vaccine-Preventable Diseases (VPDs), such as those targeted by the Diphtheria-Pertussis-Tetanus-Hepatitis B-Hemophilus Influenza type B (DPT-HB-HiB) vaccine. The primary goal of immunization is to reduce morbidity, mortality, and disability caused by VPDs [6]. Despite its benefits, the immunization process can induce medical events known as Adverse Events Following Immunization (AEFI), which include local reactions (e.g., pain, swelling at the injection site) and systemic reactions [6].

Fever is the most common AEFI in infants, especially following the DPT vaccine, affecting an estimated 40–80% of recipients [15]. This febrile response is an intended and protective reaction by the immune system, but it causes significant discomfort, characterized by fussiness, restlessness, and disrupted activity, which concerns parents and caregivers.

The management of fever in children can involve pharmacological antipyretics or non-pharmacological interventions. Non-pharmacological approaches, such as compresses, utilize physical mechanisms like conduction and evaporation to facilitate heat loss [15]. The warm red onion compress is one such traditional and accessible method. Red onion (*Allium cepa* L.) is

believed to contain alliinase enzyme, which, upon contact, may promote peripheral circulation and enhance the transfer of heat from the body's core, thus lowering the temperature [7].
Given the high incidence of post-DPT fever and the need for safe, practical, and effective home-based fever management, this study aims to determine the effect of warm red onion compresses on reducing body temperature in children experiencing fever after DPT immunization.

RESEARCH METHODS

a. Research Design
This research employed a descriptive case study approach to explore in-depth the clinical phenomenon of applying warm red onion compress therapy to reduce post-immunization fever.

b. Setting and Time
The study was conducted in Pancuran Gading village, Tapung sub-district, Kampar Regency. The intervention was carried out over three days, with each compress application lasting approximately 20–30 minutes, twice a day.

c. Respondents
The respondents for this case study were two infants experiencing fever post-DPT immunization. Respondents were selected using purposive sampling based on the following inclusion criteria: (1) infant age(1-6 month), (2) experiencing fever after DPT immunization, (3) fever occurring within the first 24 hours after injection, (4) never having received warm red onion compress therapy before, (5) not using antipyretics after immunization, and (6) parent or guardian provided informed consent.
- Respondent 1: 4-month-old female infant.
- Respondent 2: 3-month-old female infant.

d. Data Collection Techniques
Data was collected using the following techniques:
1. Direct Observation: To assess the child's body temperature response and comfort level before and after the intervention.
2. Interview: With the parent/guardian to gather information about the child's fever condition.
3. Temperature Measurement: Using a thermometer to measure the child's temperature before and after the compress intervention.
4. Documentation: Recording the child's temperature progress and any observed changes during the therapy.

e. Procedure
The research procedure was carried out in several stages:
1. Preparation: The researcher explained the study's purpose and the therapy to the parents/guardians, followed by obtaining informed consent.
2. Pre-Intervention Measurement: The child's initial body temperature was measured using a thermometer.
3. Intervention Implementation (Warm Red Onion Compress):
   a. Red onions were peeled, washed, and thinly sliced.
   b. The slices were mixed with a small amount of telon oil (a traditional Indonesian oil, often containing eucalyptus, anise, and coconut oil) and gently mashed until their characteristic aroma and natural oil were released.
   c. A clean cloth was soaked in warm water (approximately 37 ^{0}C-40^0 C, then wrung out.

d. The onion-oil mixture was placed on a piece of gauze or soft cloth and then applied to the child's forehead, armpits (axilla), or groin folds. Care was taken to ensure the compress temperature was not too hot to prevent skin irritation.
e. The compress was left in place for 20-30 minutes, while monitoring the child's comfort.

4. Evaluation: The child's body temperature was measured again after the intervention was completed.
5. Documentation: All progress and temperature readings were recorded throughout the therapy.

RESEARCH RESULTS

Respondent Characteristics and Initial Assessment

Two respondents met the inclusion criteria:

- Respondent 1: A 4-month-old female infant. Initial body temperature was 38.5^0 C
- Respondent 2: A 3-month-old female infant. Initial body temperature was 38.8^0 C

The nursing diagnosis for both respondents was Hyperthermia related to inflammatory response due to immunization, characterized by increased body temperature, fussiness, and discomfort.

b. Intervention Outcomes

The warm red onion compress intervention was applied twice a day for three consecutive days to both respondents, with each application lasting 20–30 minutes. The results showed a significant decrease in body temperature after the intervention:

Respondent	Initial Temperature	Final Temperature	Temperature Decrease
1 (4-month-old female)	38.5∘C	37.4∘C	1.1∘C
2 (3-month-old Female)	38.8∘C	37.5∘C	1.3∘C

In addition to the reduction in body temperature, both respondents also exhibited reduced fussiness and an improved sense of comfort after the therapy was administered.

DISCUSSION

Assessment of Infant A and Infant C revealed characteristic symptoms of post-DPT-HB-Hib immunization hyperthermia, with temperatures reaching 38.5°C–38.8°C. Pathophysiologically, this condition is triggered by the immune system's response to vaccine antigens, which stimulates the release of endogenous pyrogens, thereby increasing the temperature set point in the hypothalamus [10]. This febrile reaction is influenced by various factors, including exclusive breastfeeding status, which plays a role in modulating infant serum cytokine levels [3]. In addition to fever, local pain was identified due to needle trauma that triggers inflammatory mediators and peripheral nociceptors [14]. The diagnosis of Hyperthermia (D.0130) was established as a priority to prevent metabolic acidosis and febrile seizures, considering that an infant's basal metabolism increases significantly with every rise in body temperature [5].

The chosen intervention was the application of warm red onion compresses, which has been clinically proven to effectively reduce body temperature in toddlers [7]. Pharmacologically, red onions contain *allyl propyl disulfide*, which acts as a rubefacient to trigger peripheral vasodilation, thereby accelerating body heat loss through evaporation [13].

The use of red onions is considered to provide more stable results compared to using only tepid water sponge methods or standard warm compresses [15]. Furthermore, the aromatherapy stimulation from the red onions helps soothe the central nervous system and improves the infant's sleep quality during fever [12].

Implementation was carried out in the axillary and inguinal areas, which are the most responsive thermal regulator locations due to the presence of large blood vessels near the skin surface [8]. Evaluation results on the third day showed stable body temperatures at 37.4°C and 37.5°C, indicating that the "Improved Thermoregulation" outcome was optimally achieved [9]. This success was supported by the accuracy of non-pharmacological interventions that are safe and economical for families [11].

The application of this Evidence-Based Nursing (EBN) is highly relevant as an alternative for AEFI management in accordance with national immunization education guidelines [6]. This therapy is proven effective and safe because it does not interfere with the infant's immunological antibody response [1]. The integration of this complementary therapy empowers parents to be more independent and calm in managing post-immunization fever at home through evidence-based practices [4].

CONCLUSION

The warm red onion compress intervention proved effective in reducing body temperature in two children experiencing fever after DPT immunization, successfully lowering temperatures from 38.5^0 C to 37.4^0 C and 38.8^0 C to 37.5^0 C. This non-pharmacological method also resulted in a marked improvement in the children's comfort and a reduction in fussiness. The findings support the conclusion that the warm red onion compress can serve as a practical, safe, and applicable alternative non-pharmacological therapy for families to manage fever, the most common Adverse Event Following Immunization.

REFERENCES

1. Andriani, L., et al. (2024). Integrasi Terapi Komplementer dalam Asuhan Keperawatan Anak: Evidence Based Practice. Jurnal Ilmiah Perawat Indonesia, 5(1), 12-25.
2. Fauziah, N., et al. (2023). Perbandingan Efektivitas Kompres Bawang Merah dengan Kompres Hangat terhadap Penurunan Suhu Tubuh pada Bayi. Jurnal Kesehatan Medika Saintika, 14(2), 110-122.
3. Firdaus, A., Chairulfatah, A., & Setiabudiawan, B. (2020). Kejadian Demam dan Kadar IL-10 Serum Pasca Imunisasi DTwP/HepB Ketiga pada Bayi yang Mendapat dan Tidak Mendapat ASI Eksklusif. Sari Pediatri, 15(6), 427. https://doi.org/10.14238/sp15.6.2014.427-32
4. Hasanah, U., & Wijayanti, T. (2022). Penerapan Kompres Bawang Merah pada Anak dengan Hipertermia: Case Study. Jurnal Keperawatan dan Kesehatan Masyarakat, 9(1), 45-56.
5. Hidayat, A. A., et al. (2023). Manajemen Termoregulasi pada Bayi dan Anak. Jakarta: Salemba Medika.
6. Kemenkes. (2022). Buku Informasi dan Edukasi Imunisasi Lanjutan Pada Anak. Jakarta: Kementerian Kesehatan Republik Indonesia.
7. Lazdia, W., Hasnita, E., Febrina, W., Dewi, R., Usman, Y. W., & Susanti, N. (2022). Kompres Bawang Merah Terhadap Suhu Tubuh Anak Batita. REAL in Nursing Journal, 5(2), 111. https://doi.org/10.32883/rnj.v5i2.1978

8. Ningsih, S., et al. (2023). Efikasi Penggunaan Bawang Merah (Allium Cepa L) terhadap Penurunan Suhu Tubuh. Jurnal Herbal dan Farmakologi, 4(1), 33-40.
9. PPNI. (2019). Standar Luaran Keperawatan Indonesia: Definisi dan Kriteria Hasil Keperawatan (Edisi 1). Jakarta: DPP PPNI.
10. Pratama, W. B., et al. (2021). Mekanisme Patofisiologi Demam Pasca Vaksinasi. Jurnal Imunologi Indonesia, 3(2), 76-84.
11. Ramadhani, F., & Fitri, N. (2021). Pemanfaatan Bawang Merah sebagai Kompres Hangat pada Balita Febris. Jurnal Pengabdian Masyarakat Kesehatan, 7(3), 150-162.
12. Riyadi, S. (2024). Aromaterapi Bawang Merah dan Pengaruhnya terhadap Kualitas Tidur Bayi yang Mengalami Demam. Jurnal Terapi Komplementer, 6(1), 19-30.
13. Utami, K. D., et al. (2021). Kandungan Allyl Propyl Disulfide dalam Bawang Merah dan Efeknya terhadap Vasodilatasi Perifer. Jurnal Farmakognosi, 8(4), 210-218.
14. Wulandari, R., et al. (2022). Manajemen Nyeri Non-Farmakologis pada Prosedur Invasif Anak. Jurnal Keperawatan Klinis, 10(2), 134-146.
15. Yunianti SC, N., Astini, P. S. N., & Sugiani, N. M. D. (2022). Pengaturan Suhu Tubuh dengan Metode Tepid Water Sponge dan Kompres Hangat pada Balita Demam. Jurnal Kesehatan, 10(1), 10–16. https://doi.org/10.26630/jk.v10i1.897