DIFFERENCES IN THE EFFECTIVENESS OF RED ONION COMPRESS THERAPY ON FEVER IN INFANTS POST-DPT IMMUNIZATION

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ABSTRAK : PERBEDAAN EFEKTIFITAS TERAPI KOMPRES BAWANG MERAH TERHADAP DEMAM PADA BAYI PASCA IMUNISASI DPT

Pendahuluan: Demam yang sering terjadi pasca imunisasi atau sering disebut dengan KIPI. KIPI merupakan suatu gangguan yang sering terjadi pada bayi dan balita. Data Riset Kesehatan Dasar di Indonesia, terdapat 33,4% bayi yang mengalami KIPI dan 6,8% mengalami KIPI dengan demam tinggi. Menurunkan berbagai cara, salah satu diantaranya menggunakan kompres bawang merah.

Tujuan: Tujuan penelitian ini untuk mengetahui perbedaan pengaruh terapi kompres bawang merah terhadap demam pada bayi pasca imunisasi DPT di Wilayah Kerja Puskesmas Non Rawat Inap Indraloka Jaya Kabupaten Tulang Bawang Barat tahun 2024.

Metode Penelitian: Jenis penelitian ini adalah penelitian kuantitatif dengan metode *pre experiment* dan *one group pretest and posttest design.* Sampel dalam penelitian ini adalah sebagian bayi yang demam pasca imunisasi DPT di Wilayah Kerja Puskesmas Non Rawat Inap Indraloka Jaya Kabupaten Tulang Bawang Barat berjumlah 40 orang. Teknik sampel yang digunakan *purposive sampling.* Analisis data menggunakan uji *wilcoxon*.

Hasil: Hasil penelitian ini menunjukkan bahwa rata-rata suhu tubuh sebelum diberikan terapi kompres bawang merah pada bayi pasca imunisasi DPT adalah 38,038^{o}C dan setelah diberikan terapi kompres bawang merah menurun menjadi 37,15 ^{o}C. Dengan median sebelum di kompres 38,0 ^{o}C dan sesudah di kompres 37,0 ^{o}C Hasil uji *wilcoxon* didapatkan p *value* 0,000 < 0,05 artinya ada perbedaan pengaruh terapi kompres bawang merah terhadap demam pada bayi pasca imunisasi DPT.

Kesimpulan: Ada perbedaan pengaruh terapi kompres bawang merah terhadap demam pada bayi pasca imunisasi DPT.

Kata kunci: Kompres, Bawang Merah, Demam, Imunisasi DPT, KIPI

ABSTRACT

Introduction: Fever occurring after immunization, often referred to as Adverse Events Following Immunization (AEFI), is a common issue in infants and toddlers. According to the Basic Health Research data in Indonesia, 33.4% of infants experience AEFI, and 6.8% of them have high fever. Various methods can be used to manage fever, one of which is using a red onion compress.

Purpose: This study aims to determine the difference in the effect of red onion compress therapy on fever in infants post-DPT immunization in the working area of Indraloka Jaya Primary Health Care, Tulang Bawang Barat Regency 2024.

Method: This is a quantitative study using a pre-experimental design with a one-group pretest and posttest approach. The sample consists of 40 infants experiencing fever post-DPT immunization in the working area of Indraloka Jaya Primary Health Care, Tulang Bawang Barat Regency. Purposive sampling was used for selecting the sample. Data analysis was conducted using the Wilcoxon test.

Results: The results indicate that the average body temperature before administering red onion compress therapy was 38.038°C, and it decreased to 37.15°C after the therapy. The median temperature before the compress was 38.0°C and 37.0°C after the compress. The Wilcoxon test yielded a p-value of 0.000 < 0.05, indicating a significant difference in the effect of red onion compress therapy on fever in infants post-DPT immunization.

Conclusion: A significant difference in the effect of red onion compress therapy on fever in infants post-DPT immunization.

Keywords: Compress, Red Onion, Fever, DPT Immunization, AEFI

INTRODUCTION

Immunization is an effort to induce or enhance an individual's active immunity against a specific disease, ensuring that if exposed to said disease, they will either not contract it or experience only mild symptoms. Communicable diseases prevented through immunization include Diphtheria, Pertussis, Tetanus, Tuberculosis, Measles, Poliomyelitis, Hepatitis B, Haemophilus influenzae type b (Hib), Human Papillomavirus (HPV), and Hepatitis A. As immunization coverage increases, so does the incidence of side effects (Ministry of Health, Republic of Indonesia, 2022).

The national coverage of complete basic immunization has increased from 84.2% in 2021 to 99.6% in 2022. At the provincial level, Central Java achieved the highest coverage (114.1%), while Aceh had the lowest (48.1%). Lampung Province reached 106.4% coverage (Ministry of Health, Republic of Indonesia, 2023).

Undesirable events following immunization are referred to as Adverse Events Following Immunization (AEFI). These encompass medical occurrences related to immunization, including vaccine reactions, injection reactions, pharmacological effects, procedural errors, and coincidental events. The National Committee for Assessment and Management of AEFI categorizes AEFI etiologies into two classifications: procedural/technical errors and known causes, which include injection reactions, vaccine reactions, and coincidental factors (Ministry of Health, Republic of Indonesia, 2022).

According to United Nations Children's Fund (UNICEF) data, mild AEFI (local and systemic reactions) caused by DPT-HB immunization account for 78% of total doses administered. The World Health Organization reports that AEFI rates are 60 times higher in developing countries compared to developed nations. This disparity is attributed to developing countries' use of whole-cell DPT-HB vaccines, which have greater side effects, while developed countries like the United States and European nations have transitioned to acellular DPT-HB vaccines with minimal side effects for 80% of their immunization programs (Ministry of Health, Republic of Indonesia, 2022).

The Indonesian Demographic and Health Survey (2017) reported that 31% of children under 5 years old experienced fever, with 37% of infants aged 6-23 months being more susceptible to fever. 74% of these cases were brought to health facilities (Ministry of Health, Republic of Indonesia, 2022). Indonesia's Basic Health Research data indicates that 33.4% of infants experienced AEFI out of 91.3% who received immunizations, with symptoms including redness (20.6%), swelling (20.2%), high fever (6.8%), and suppuration (6%) (Ministry of Health, Republic of Indonesia, 2022).

Post-immunization side effects may include fever (resolving within 1-2 days), pain at the injection site, inflammation, and seizures. Common AEFI reactions at the injection site include pain, swelling, and redness, sometimes accompanied by fever one to two days post-immunization (Harianah, 2014).

Fever, a frequent AEFI, is a common disorder in infants and young children. Body temperature can be measured using a digital thermometer, with fever defined as an increase of 0.8˚C to 1.1˚C above normal body temperature, typically exceeding 38˚C. Fever is a normal bodily response to infection or an adjustment of antibodies following immunization. Causes of fever in infants include viral infections, excessive heat exposure (overheating), dehydration, allergies, AEFI, and immune system disorders. While generally not dangerous, high fevers can pose risks to infants, potentially leading to dehydration, oxygen deprivation, neurological damage, and febrile convulsions (Azriful et al., 2018; Fadli & Hasan, 2018; Ridha, 2019).

Fever in children can be managed through various methods, including pharmacological interventions such as antipyretics. These work centrally to lower the temperature set point in the hypothalamus, followed by physiological responses including decreased heat production, increased blood flow to the skin, and enhanced heat release through radiation, convection, and evaporation. However, antipyretics can have side effects, including bronchospasm, gastrointestinal disturbances, reduced renal function, and potential suppression of serum antibody responses (Sumarmo, 2010).

Non-pharmacological methods for reducing fever include hot water compresses, ice therapy, and onion compresses. A traditional method utilizing conduction and evaporation principles involves using onion compresses. Onions contain an organic sulfur compound, Allylcysteine sulfoxide (Alliin), which functions to disrupt blood clot formation. This promotes blood circulation, facilitating the transfer of internal body heat to peripheral blood vessels. Alliin is volatile, especially at temperatures between 20ºC and 40ºC (Dompas, 2019).

A pre-survey of 10 children experiencing AEFI following DPT immunization at the Indraloka Jaya Non-Inpatient Community Health Center revealed that 40% of mothers used traditional remedies such as warm water compresses and resorted to pharmacological treatments only if the fever

worsened. 30% of mothers administered antipyretics provided during immunization, while the remaining 30% sought immediate medical attention at healthcare facilities without attempting alternative treatments).

RESEARCH METHODS

This is a quantitative study using a pre-experimental design with a one-group pretest and posttest approach. The sample consists of 40 infants experiencing fever post-DPT immunization in the working area of Indraloka Jaya Primary Health Care, Tulang Bawang Barat Regency. Purposive sampling was used for selecting the sample. Data analysis was conducted using the Wilcoxon test.

RESEARCH RESULTS

Based on the table above, it is known that from 40 respondents, the average body temperature of babies after DPT immunization before being given onion compress therapy was 38.038° C with a standard deviation of 0.3078° C, a minimum temperature of 37.7° C and a maximum of 38.5° C.

Table 1
Average body temperature before giving onion compress therapy to babies after DPT immunization

Baby's Body Temperature	n	Mean	Standard Deviation	Min-Max
Before giving a red onion compress	40	38,038	0.3078	37.7 - 38.5

Table 2
Average body temperature after giving red onion compress therapy to babies after DPT immunization

Baby's Body Temperature	N	Mean	Standard Deviation	Min-Max
After being given a red onion compress	40	37.15	0.2944	36.7 – 37.6

Based on the table above, it is known that of the 40 respondents, the average baby's body temperature after DPT immunization after being given red onion compress therapy was 37.15 ° C with a standard deviation of 0.2944 ° C, a minimum temperature of 36.7° C and a maximum of 37.6 ° C.

Table 3
Differences in the effect of shallot compress therapy on fever in babies after DPT immunization

Baby's Tube Temperature	n	Mean	Median	Ties	P *value*
Before Intervention	40	38,038	38	0	0,000
After Intervention	40	37.15	37		

Based on the table above, it is known that body temperature before being given shallot compress therapy was found to be a median value of 38 ° C and after being given shallot compress therapy it decreased to 37 ° C. The tie value was 0. The mean before being given shallot compress therapy was 38.03 ° C and the mean after 37.15 ° C. *The Wilcoxon test results* showed that the p *value* was 0.000 < 0.05, meaning there was a difference in the effect of shallot compress therapy on fever in babies after DPT immunization in the Indraloka Jaya Non-Inpatient Health Center Working Area, Tulang Bawang Barat Regency in 2024.

DISCUSSION

Average body temperature before giving onion compress therapy to babies after DPT immunization

The results of this study showed that from 40 respondents the average body temperature of babies after DPT immunization before being given onion compress therapy was 38.038 ° C with a standard deviation of 0.3078 ° C, a minimum temperature of 37.7 ° C and a maximum of 38.5 ° C.

Most babies' body temperatures found during research experienced an increase in the range of 37.7-38.5 ° C, namely between the ages of 2 months and 5 months. From the observation sheet and data analysis carried out, babies who received DPT 1 immunization were more susceptible to AEFI fever with a higher temperature increase compared to babies who received DPT 2 or DPT 3 immunization.

One of the causes of fever is DPT immunization. Vaccines are antigens in the form of dead microorganisms or live weakened microorganisms, which have been processed into

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toxoids, recombinant proteins which, when given to a person, will create active specific immunity against certain infectious diseases. Therefore, there will be medical events related to immunization in the form of vaccine effects or side effects, toxicity, sensitivity reactions, pharmacological effects or program errors, coincidences, injection reactions or causal relationships that cannot be determined (Ambarwati and Iswati, 2023).

This research is in line with research conducted by Rahmawati et al (2024) which shows that the average body temperature of children who experienced fever after DPT immunization before the onion compress was applied in the intervention group was 38.58 ºC. (SD +0.273) with a temperature min-max 37.00 º C-39.00 º C. as well as research conducted by Cahyaningrum (2017) entitled "Differences in Body Temperature of children with fever before and after Red Onion Compress". The results of the study showed that there was a difference or difference in the average temperature before and after the onion compress, namely 0.734 °C with a significant value (p = 0.000), so it was concluded that there was a significant difference in body temperature between before and after the onion compress.

According to researchers, fever that occurs due to immunization usually occurs because a pathogen is introduced (bacteria, viruses, germs or small animals) into the body. This fever usually occurs due to the body's reaction when fighting incoming pathogens. The fever that appears can be treated using pharmacological and non-pharmacological methods. Apart from that, the protective layer between the blood vessels and the nervous system of babies less than 3 months old is still very thin so they do not have strong immunity.

Average body temperature after giving onion compress therapy to babies after DPT immunization

The results of this study showed that from 40 respondents, the average body temperature of babies after DPT immunization after being given onion compress therapy was 37.15 º C with a standard deviation of 0.2944 º C, a minimum temperature of 36.7 ºC and a maximum of 37. 6 ºC.

Shallots (*Allium cepa variety ascalonicum*) can be used as a medicine to reduce fever in infants and toddlers with fever. The content of organic sulfur compounds, or *Allylcysteine Sulfoxide (Alliin)* can reduce fever by breaking down the formation of blood clots, allowing blood circulation to stabilize and heat from the body to be distributed to peripheral blood vessels. Other ingredients in red onions that can reduce body temperature include essential oils, phlorogusin, cycloaliin, methylalin, kaempferol and quercetin. The atsirin content as an external medicine functions to dilate capillary blood vessels and stimulate sweating. Rubbing red onions all over the body will cause strong vasodilation in the skin, which accelerates the transfer of heat from the body to the skin (Pebriani et al, 2023).

This research is in line with research conducted by Rahmawati et al (2024) which showed that after being given intervention the average temperature of children was 37.09 ºC. (SD +0.239) with a min-max temperature of 36.78 ºC - 37.44 ºC. and cahyaninggrum (2017) that there is a difference or difference in the average temperature before and after the shallot compress, namely 0.734 °C with a significant value (p = 0.000).

The results of body temperature measurements from 40 respondents showed differences in the decrease in body temperature for each baby. The difference between the decrease in the baby's body temperature and the highest temperature decrease is 1.3 °C and the lowest temperature decrease is 0.7 °C. with a mean of 0.9 °C and a median of 0.9 °C and a mode of 0.7 °C. Based on observations made by researchers, there was a significant decrease in body temperature in babies aged 3 months and over. And the difference in the average decrease in body temperature before and after the onion compress was 0.88 °C.

According to researchers, 5 grams of grated red onion used to compress a feverish baby and placed on the baby's stomach for 15 minutes has a significant effect on the baby's body so that it can reduce the baby's body temperature. The decrease in body temperature that occurs is very diverse, this is due to several things, including fussy babies so it is difficult to give grated shallots to their stomachs so that the shallots do not work optimally, because the baby moves a lot, cries and so on.

Shallot compress applied to the skin can be responded to by peripheral thermoreceptors and the peripheral nervous system so that it goes to the hypothalamus or thermoregulator to respond to existing stimuli, so that it can reduce skin temperature through skin vasoconstriction, which is coordinated by the hypothalamus through the output of the sympathetic nervous system. So the substances contained in shallots can reduce the body temperature of respondents.

Differences in the effect of shallot compress therapy on fever in babies after DPT immunization

Based on the research results, it is known that the median value before applying the shallot compress was 38.0°C and after applying the shallot compress was 37.0°C. ties value is 0°C. It is known that the significance value is 0.000 (ρ<0.05), which means there is a significant difference in the decrease in the baby's body temperature before and after giving the onion compress. It can be concluded that there is an effect of onion compresses on reducing body temperature in feverish babies after DPT immunization in the Indraloka Jaya Non-Inpatient Health Center Working Area, West Tulang Bawang Regency in 2024.

Rubbing shallots on the surface of the skin will stimulate the veins to change size which is regulated by the hypothalamus to control heat output. To provide a vasodilation response to blood vessels, making it possible for increased heat output through the skin, pores begin to open, and evaporative heat release (sweating) occurs so that ultimately body temperature will return to normal (Wardiyah & Romayati, 2016).

This research is in line with research conducted by Ambarwati and Iswati (2023) which shows that there is an influence on body temperature after DPT immunization before and after being given a shallot (*allium ascalonicum l*) compress. Supported by research conducted by Kurnia and Hanifa (2023) which showed that red onion compresses were proven to be effective in reducing baby's body temperature after DPT immunization in PMB N in 2023

Of the 40 respondents in this study, all babies experienced a decrease in body temperature. The difference in the average decrease in the baby's body temperature before and after the onion compress was 0.9°C. with the highest decrease of 1.3°C and the smallest decrease of 0.7°C. This is caused by several factors that influence the decrease in temperature, namely the child's age which greatly influences the body's metabolism due to hormonal mechanisms, thus having an indirect effect on body temperature. And there are other factors such as the frequency of DPT immunization that the baby has received.

Variations in body temperature reduction can be attributed to several key factors. Firstly, the age factor plays a significant role, with 2 month old babies showing the highest average body temperature (38.31°C), while older babies (3-5 months) have relatively lower and more stable temperatures. This may reflect ongoing development of the thermoregulatory system in younger infants. Second, immunization status influences body temperature response, with babies who have just received DPT immunization, especially DPT 1, showing a tendency for a higher increase in body temperature as a side effect of the vaccine. Babies who have received DPT 2 or DPT 3 have a more adaptive immune response, resulting in less intense fever side effects.

However, there are limitations in this research, including not testing further the effect of giving onion compresses on respondent characteristics such as the baby's age, gender, and the frequency of DPT immunization received by the baby.

Rubbing shallots on the surface of the skin will stimulate the veins to change size which is regulated by the hypothalamus to control heat output. To provide a vasodilation response to blood vessels, making it possible for increased heat output through the skin, pores begin to open, and evaporative heat release (sweating) occurs so that ultimately body temperature will return to normal (Wardiyah & Romayati, 2016).

According to researchers, onion compresses are effective in reducing body temperature in children with fever. This is because red onions contain *organic sulfur compounds*, namely *Allylcysteine sulfoxide (Alliin)*, which functions to destroy the formation of blood clots. This makes blood circulation smooth so that heat from within the body can be more easily distributed to the peripheral blood vessels.

CONCLUSION

The average body temperature before giving onion compress therapy to babies after DPT immunization in the Indraloka Jaya Non-Inpatient Health Center Working Area, West Tulang Bawang Regency in 2024 was 38,038 o C.The average body temperature after giving onion compress therapy to babies after DPT immunization in the Indraloka Jaya Non-Inpatient Health Center Working Area, West Tulang Bawang Regency in 2024 is 37,150 o C.

There is a difference in the effect of onion compress therapy on fever in babies after DPT immunization in the Indraloka Jaya Non-Inpatient Health Center Working Area, West Tulang Bawang Regency in 2024 with a p value of 0.000.

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