

Abelmoschus Manihot L as Fever Reducing (Adverse Event Following Immunization) After Dtp- Hb-Hib Vaccine

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ABSTRACT

Fever is a common clinical complaint for toddler as well as a frequently reported Adverse Event Following Immunization (AEFI) after DTP-HB-Hib vaccine administration. Commonly, the parent used a reliever as a drugs fever. Naturally, therapies from natural products consider better than chemical drugs cause can relieve the body from the effect of chemical substances contains in drugs fever. *Abelmoschus Manihot L.* leaf boiled water has vitamin A, vitamin C, potassium, folic acid, collagen substances, riboflavin, flavonoids, methanol, polyphenols, saponins, alkaloids, so they give an anti-inflammatory effect, antioxidant effect after consumption. The study aims to determine the effect of *Abelmoschus Manihot L.* leaf boiled water to reduce the fever after DTP-HB-Hib vaccine. The study was a quasy experiment with one group pre-post test design. The population was 19 toddlers with simple random sampling who have a fever (37.5°C until 39°C) after the vaccine was given *Abelmoschus Manihot L.* leaf boiled water as much 200 cc. The study was conducted in Surantih Public Medical Centre, Pesisir Selatan, West Sumatera, Indonesia. With inclusion criteria toddler aged 1 - 5 year and have given informed consent. The statistical analysis used paired sample t-test. There was significant differences in the body temperature of the toddler ($p = 0.001$). Further analysis demonstrated a favorable effect, before administration (mean = 38,10°C) and after administration (mean = 36,95°C). From the effects obtained, it can be recommended to therapies reliever fever (AEFI).

Keywords: *Abelmoschus Manihot L, Fever, AEFI, Vaccine*

1. INTRODUCTION

Immunization is one of the most effective ways to prevent morbidity and mortality from infectious disease, and the way is by injecting vaccines [1]. The government of Indonesia provides vaccines against five vaccine preventable diseases which include diphtheria, tetanus, pertussis (whooping cough), hepatitis B, and *Haemophilus influenzae type b*, which are serious and sometimes fatal diseases. In Indonesia, this vaccine was namely DTP-HB-Hib pentavalent vaccine (combination vaccine) developed and manufactured by Biofarma, Bandung, Indonesia [2]. This vaccine was injected into infants from 2 to 4 months of age [3].

Fever is frequently associated with an Adverse Event Following Immunization (AEFI) [4][5]. AEFI was a form of the body's response to an injected

vaccine with a different reaction for each person [6]. List of AEFI (adapted from AEFI Epidemiological Surveillance Manual and the vaccine package insert), Very common (> 10% of vaccinated patients), the reaction are: somnolence, redness at vaccine site (erythema), swelling at vaccine site, fever (>37.5°C <39°C), induration, pain at the vaccine site. Common (1% to 10% of vaccinated patients), the reactions are gastrointestinal symptoms, diarrhea, vomiting, reactions at vaccine administration, itching, and pain. Uncommon (0.1% to 1.0% of vaccinated patients), the reactions are headache, coughing, bronchitis, skin rash, stiffness, fatigue, fever (>39.1°C), diffuse swelling of the limb in which vaccine was administrated and diffuse swelling of limb joint. Rare (0.01%), the reaction is lymphadenopathy. Very rare, the reaction is an allergic reaction. Extremely rare, the reactions are collapse or shock (syncope), and convulsion [3][7][8].

Commonly, fever is part of the normal as affects inflammatory response and frequently occurs in response to infection. This is a body mechanism against infections. Although generally benign, fever as an Adverse Event Following Immunization (AEFI) concern for parents and healthcare professionals, driven by fears of febrile convulsion and considered to be a serious case, pathological, and severe case [9]. The categorize of the fever was defined as axillary temperature of 37.5–39.0°C (mild), 39.1–40.0°C (moderate), and >40.0°C (severe) [4].

Therefore, both parents gave prophylactic paracetamol to decrease the febrile reactions. But, many studies reported prophylactic paracetamol has also been shown to reduce immune responses to some vaccine antigens and needs careful consideration [10][4].

Abelmoschus Manihot L, a traditional/ herbal plants have benefits in the treatment of diseases. In Indonesia, Its namely “Daun Gedi”. In addition to being used as medicine, the people in Pesisir Selatan use this leaf as a vegetable in traditional dishes like “Gulai” but in South Sulawesi, this leave used a dish like “Bubur Manado” [11].

In several studies, Liwei Shi et al (2019), *Abelmoschus Manihot L* can be recommended to protect the kidney function in a patient with Diabetic Nephropathy [12]. Jun Zhang et al (2020), the flower of *Abelmoschus Manihot L* could significantly attenuate ethanol-induced gastric injury via antioxidative, anti-inflammatory, and antiapoptotic effects [13]. Jianhao Hou et al (2020), *Abelmoschus manihot L* derived Huangkui capsules exerted protective effects on multiple myeloma in mice [14].

Alternative therapies with traditional/ herbal plants are commonly pursued because consumers perceive them to be wholesome and devoid of toxic chemicals so it's safe to consume [11]. With all the benefits, the study aims to determine the effect of *Abelmoschus Manihot L* to reduce the fever - Adverse Event Following Immunization (AEFI) after DTP-HB-Hib vaccine.

2. METHODS

The study was a quasy experiment with the one group pre-post test design. The study population was 25 toddlers. The Sampling technique used the simple ransom sampling as much as 19 toddlers. The study was conducted in Surantih Public Medical Centre, Pesisir Selatan, West Sumatera, Indonesia

from December 2019 until June 2020.

Inclusion criteria: toddlers aged range from 1 year to 5 years of age after DTP-HB-Hib Vaccine with fever. DTP-HB-Hib vaccines used in this study were developed and manufactured by Bio Farma, Bandung, Indonesia. The severity grading for measurable Adverse Events Following Immunization (AEFI) like the fever was defined as mild 37.5°C until 39°C (axillary temperature). The axillary temperature was measured by a digital thermometer.

Before giving the treatment, the researcher provided the information about the intervention that will be doing with the parents (informed choice) and then give a signed (informed consent).

Exclusion criteria: parents of the toddlers refused the informed consent and they were given prophylactic paracetamol after vaccination excluded as a sample. After vaccine injection appears redness after injection, induration, fever with convulsions, bruising and swelling in injecting located was excluded as a sample too.

Abelmoschus Manihot L leaves are processed by boiling with water until it boils. The selected leaf is a fresh green leaf then washed with water clean. 5 leaves were boiled in 500 cc water until the water boils as much as 200 cc. The boiled water of *Abelmoschus Manihot L* leaves was given to the toddlers three times if they were a fever.

The statistical analysis used paired sample t-test with a normality test. Summary statistics were expressed as means (mean of axillary temperature) ± Standard Deviation (SD) and 95% Confidence Intervals (CI) for comparing the group (paired group).

3. RESULT

Based on table 1, the result of the study was founding a significant difference between temperature before administration (38.10 ± 0.198) and temperature after administration (36.95 ± 0.273) with $p = 0.001$.

Table 1. Effect of *Abelmoschus Manihot L* As Relief The Fever (Adverse Event Following Immunization) After DTP-HB-Hib Vaccine

Groups N = 19	Mean ± SD	Min - Max	p-value
Temperature before administration	38.10 ± 0.198	37.8 – 38.5	0.001*
Temperature after administration	36.95 ± 0.273	36.5 – 37.5	

4. DISCUSSION

The study of Pecurariu et al (2016) reported, antipyretic paracetamol as administration if the toddlers were fever (immediate and 6-8 hour post vaccination) has also been shown to reduce immune responses. This reaction seems with significantly lower antibody Geometric Mean Concentrations (GMCs). The same study conducted by Walter et al (2017) also found the same thing. So we conclude that, prophylactic administration of antipyretic drugs like paracetamol at the time of vaccination should not be routinely recommended.

The significant effects were found in this study with giving the boiled water of *Abelmoschus Manihot L* can reduce the fever. Some benefits reported in study of Nurjanah (2016) *Abelmoschus Manihot L* leaf extract can reduce blood pressure in rats strain wistar [15]. The other study of Hou et al (2020), present that the bioactive component of this plants protect the multiple myeloma from chemicals effect (study with a mice).

Based on the phytochemical study of the *Abelmoschus Manihot L* leaf reported the leaves contains vitamin A, vitamin C, potassium, thiamin, folic acid, collagen, riboflavin, flavonoids, amino acids, polyphenolic, nucleosides, polysaccharides, organic acids, sterols, volatile oils, saponins, and alkaloids which when these compounds work together have pharmacological activities as; antidiabetic nephropathy activity, antioxidant and antiadipogenic activity, anti-inflammatory and analgesic activities, anticonvulsant and antidepressant activities, neuroprotective activity, antiviral activity, antitumor activity, hepatoprotective activity, cardioprotective activity, immunomodulatory activity, proangiogenic activity, antiplatelet activity, the effects that can treat various diseases [11]. So, there are many active

components this plant can protect the body from affect diseases.

Abelmoschus Manihot L boiled water can reduce the temperature axilla of the toddler with fever caused by the chemical compound in it, but the mechanism was unclear, suspected cause by inhibition in the specific pyrogens pathways that communicate with the hypothalamus. The inhibition of COX-2 as a trigger of fever then reduces the levels of PGE in the hypothalamus so the axillary temperature normally.

5. CONCLUSION

Further analysis demonstrated a favorable effect after administration with the use of *Abelmoschus Manihot L*. From the effects obtained, it can be recommended to therapies to relieve the fever - Adverse Events Following Immunization (AEFI). The mechanism of boiled water *Abelmoschus Manihot L* to reducing the fever (AEFI) is unknown, so it needs to be reviewed.

AUTHORS' CONTRIBUTIONS

Kholilah Lubis, Nopa Darmiati, Desti Nataria, Indah Putri Ramadhanti, and Riri Aprianti contributed with the study concept, design, data collection, analysis, interpretation data and also writing the manuscript. All authors have approved the final manuscript and responsibility in our study.

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