

VIRGIN COCONUT OIL AND ALOE VERA TO CURE DIAPER RASH IN BABIES 0-2 YEARS OLD

Mei Lia Nindya Zulis Windyarti^{1*}, Yuni Fitri Prestian², Dyah Ayu Wulandari³

¹⁻³Faculty of Nursing and Health Sciences, Karya Husada Semarang University, Indonesia

Corresponding Author: mmeilia60@gmail.com

ABSTRACT

Background: Diaper rash is dermatitis due to irritation in the form of skin manifestations caused by various things. In Indonesia, as many as 22 million toddlers in Indonesia, around 1/3 of the number of these babies experience diaper rash. Treatment of diaper rash can be done with non-pharmacological therapy, namely by using Aloe vera because it has a therapeutic effect as an anti-inflammatory and antimicrobial and has safety in dealing with diaper rash because it contains alpha-bisabolol. Another alternative that can be used to prevent or treat diaper rash is coconut oil (coconut oil) for skin health and anti-microbial. Objective: To determine the effectiveness of VCO and Aloe vera in accelerating the healing of diaper rash in infants 0-2 years. Research Methods: Type of quantitative research with a quasi-experimental approach and a pretest-posttest design. The population in this study and with the inclusion criteria of babies 0–2 years old who experienced moderate–severe diaper rash and babies who were using diapers. Research Results: Based on the results of the Mann-Whitney test, the p-value of the Mann-Whitney test was obtained, respectively above 0.05 ($p > 0.05$), namely 0.658; 0.593; and 0.483. This insignificant difference can also be interpreted that Aloe vera and VCO have relatively similar effectiveness in healing diaper rash inflammation. Conclusion Aloe vera and VCO have the same effectiveness in healing inflammatory diaper rash.

Keywords: aloe vera, diaper rash, VCO.

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INTRODUCTION

The toddler years are a golden period and a critical period for a person's growth. It is said to be a crucial period because, during this period, toddlers are susceptible to the environment. All toddlers have very sensitive skin in the first month. The relatively thinner skin condition of toddlers makes them more susceptible to inflammation, irritation, and allergies (Argentina, 2016).

The skin of neonates and toddlers is different from the skin of adults. This comparison is often not realized, resulting in the exposure of the skin of neonates and toddlers to various dangerous substances (Cahyanto, 2017). A toddler's skin contains a lot of water, and the epidermis is loosely connected to the dermis. This causes friction to occur easily, which causes separation of these structures, which causes the formation of blisters or skin damage. This condition of a toddler's skin makes them more susceptible to inflammation,

irritation, and allergies. One of the skin problems that toddlers often experience is dermatitis, or diaper rash, often called diaper (Fölster-Holst & Wollenberg, 2017)

Diaper rash is a skin disorder that often occurs in toddlers and babies. Diaper rash is dermatitis due to irritation in the form of skin indications caused by various things. This disease often occurs in toddlers aged less than 3 years, most often aged 9 to 12 months (Lebsing, Chaiyarit, & Techasatian, 2020)

The incidence and age of the onset of diaper rash globally vary; this is related to the use of diapers, toilet training, and poor domestic hygiene. The prevalence of diaper rash is estimated at 7–35%, and the highest incidence occurs at the age of 9–12 months (Lebsing et al., 2020). Based on information released by the World Health Organization in 2012, the prevalence of skin irritation (diaper rash) in toddlers is quite large;

namely, 25% of the 6.8 million toddlers born in the world suffer from diaper dermatitis. In Indonesia, it reaches 35% of children under 3 years of age (Yuliati, 2020).

Although diaper rash is often a mild and self-limited skin disease, it represents a gateway for germs and fungi that require treatment. The trigger for diaper dermatitis or diaper rash is not yet clear, but factors such as friction, humidity, abrasion, urine and feces in contact with the skin, and changes in pH are thought to trigger diaper rash (Šikić Pogačar, Maver, Marčun Varda, & Mičetić-Turk, 2018). Currently, many drugs are used to treat diaper dermatitis, including Vaseline, talc, zinc oxide, and topical corticosteroids, but each drug has side effects, including allergies. Corticosteroids are not recommended because they cause skin atrophy, allergic dermatitis, and telangiectasis. The beneficial therapeutic effects and low side effects are two of the factors that have contributed to the increase in the use of medicinal plants in the last few decades (Boediardja, 2016; Fölster-Holst & Wollenberg, 2017).

Healing diaper rash can be tried with non-pharmacological treatments such as cleaning the diaper area carefully using water in oil, which is repeated every time after defecating, and after cleaning, using cream to avoid penetration of irritants. You can use zinc oxide, dimethicone, lanolin, and petrolatum. On the other hand, for pharmacological treatment, you can use topical hydrocortisone ointment. If you are infected with candida, give a candida antifungal such as nystatin, the azole derivative miconazole, fluconazole, clotrimazole, or a mixture of miconazole nitrate with zinc oxide and petrolatum (Cahyanto, 2017). Aloe vera has a therapeutic effect as an anti-inflammatory and antimicrobial and is safe for treating diaper rash because it contains alpha-bisabolol (Panahi, Rastgar, Zamani, & Sahebkar, 2020). Alpha-bisabolol can kill both gram-negative and gram-positive germs. Not only that, it contains flavonoids and umbelliferon, which are antifungal and anti-inflammatory. The use of aloe vera at a dose of 100–300 milligrams/kgBB can be used as an injury healer, like hydrocortisone, which is usually used as a treatment for diaper dermatitis (Nugraha, 2015; Panahi et al., 2020).

According to previous research (Yunes Panahi, 2012), aloe vera and calendula can significantly reduce the severity of diaper dermatitis in the experimental group (p-value 0.001). Not only that, there are no side effects from either of these drugs, so healing is accelerated and comfortable. Efficient in the treatment of diaper dermatitis in toddlers (Panahi et al., 2012). Another alternative that can be used to prevent or cure diaper rash is coconut oil (VCO) for skin health and anti-microbial properties. VCO also has a natural moisturizer and contains longer-chain saturated fatty acids, which can enter the skin structure. One of the contents of VCO is lauric acid and capric acid, which can kill microbes. Head oil also prevents dryness and flaking of the skin (Hussain et al., 2017). In Saidah et al.'s research, in experiments before and after giving coconut oil for diaper rash to toddlers at Siloam Hospital in Palembang, the results showed that there was a significant comparison with a p-value of 0.003. This shows that the Virgin VCO intervention can treat diaper rash in toddlers. VCO will provide nutrients through an absorption process by the skin to reduce the effects of friction and moisture, restore skin elasticity, and protect the skin from cell damage. This healing can use the natural surroundings where many medicinal plants are found, which have no less benefits in healing (Sadiah & Trianingsih, 2022).

Based on preliminary research conducted at the Bonang II Community Health Center in July–August 2021, 53 babies experienced diaper rash. Baby's diaper rash is caused by using the wrong diaper. In dealing with diaper rash, mothers always check their children at the Community Health Center, and midwives, dealing with diaper rash, generally give them hydrocortisone ointment. The contents of hydrocortisone ointment are corticosteroids, which have anti-inflammatory properties. There are side effects to using hydrocortisone ointment, including skin allergies. On the other hand, when using aloe vera and VCO, there are no side effects. So far, health workers, especially midwives, have not recognized the use of aloe vera and VCO as alternative treatments to speed up the process of treating diaper rash in babies.

METHOD

This type of research is quantitative with a research design using a quasi-experimental design with a pretest-posttest-only approach with a control group design. Sampling used a purposive sampling technique. This study was divided into 2 groups, namely the VCO and Aloe vera groups, given a topical dose of 2 x 0.5 ml for 5 consecutive days. Accelerate the healing of diaper rash using the Dermatitis Area Grading Scale measuring tool. The total sample in this study was 64 babies, with the inclusion criteria of babies 0–2 years old who experienced moderate–severe diaper rash and babies who were using diapers. Research ethics test number 0315/KEP/UNKAHA/LPPM/I/2022.

RESULTS

Analysis of the differences in the effectiveness of administering Aloe vera and VCO in accelerating the healing of diaper rash was carried out by testing the comparison of scores for inflammatory signs of diaper rash between the Aloe vera and VCO groups at each length of intervention using the Mann-Whitney test with the following results:

Table 1. Identification of Accelerated Healing of Diaper Rash Before and After Giving Aloe Vera

Length of treatment	Min-Max	Median	Mean	Modus
Day 1	2,0 – 3,0	2,50	2,44(0,44)	2,0
Day 3	1,0 – 2,5	2,00	1,66(0,63)	1,0
Day 5	0,5 – 1,0	0,75	0,75(0,26)	0,5

Table 1 shows that the inflammatory sign score for diaper rash on day 5 was lower than on days 1 and 3, namely ranging from 0.5 to 1.0 with a median and average of 0.75, respectively, and the standard deviation is 0.26. The score that appears most often is 0.5.

Table 2. Identification of Accelerated Healing of Diaper Rash Before and After Giving VCO

Length of treatment	Min-Max	Median	Mean	Modus
Day 1	2,0 – 3,0	2,40	2,36 (0,39)	2,0
Day 3	1,0 – 2,5	1,00	1,53 (0,65)	1,0
Day 5	0,5 – 1,0	0,50	0,69 (0,25)	0,5

Table 2 shows that the inflammatory sign score for diaper rash on day 5 is lower than on days 1 and 3, namely ranging from 0.5 to 1.0 with a median of 0.5 and an average of 0.69, the standard deviation is 0.25, and the score that appears most often is 0.5.

Table 3. Results of the Friedman test. Differences in scores for signs of inflammatory diaper rash according to the length of administration of Aloe vera

Intervention	Diaper Rash Inflammatory Sign Score (Mean ± SD)			p-value
	Day 1	Day 2	Day 3	
Aloe vera (n = 32)	2,44 ± 0,44	1,66 ± 0,63	0,75 ± 0,26	0,000

Table 3 shows that based on the results of the Friedman test, a p-value of 0.000 (p<0.05) was obtained, meaning that there was a significant difference in scores for signs of inflammatory diaper rash between the three durations of administration of aloe vera. The results of the Friedman test indicate that there is a difference in the acceleration of the healing of diaper rash between days 1 and 5 after intervention with Aloe vera.

Table 4: Friedman Test Results Differences in Diaper Rash Inflammation Sign Scores according to Length of VCO Administration

Intervention	Diaper Rash Inflammatory Sign Score (Mean ± SD)			p-value
	Day 1	Day 2	Day 3	
VCO (n = 32)	2,36 ± 0,39	1,53 ± 0,64	0,69 ± 0,25	0,000

Table 4 shows that based on the results of the Friedman test, a p-value of 0.000 (p<0.05) was obtained, meaning that there was a significant

difference in scores for signs of inflammatory diaper rash between the three durations of VCO administration. The results of the Friedman test indicate that there is a difference in the acceleration of the healing of diaper rash between days 1 and 5 after intervention with VCO.

Table 5: Mann-Whitney Test Results Differences in Diaper Rash Inflammatory Sign Scores between Aloe vera and VCO Groups in Various Intervention Times

Diaper rash inflammatory signs	Score Group(Mean \pm SD)		Difference	P-Value*
	VCO (n=32)	Aloe vera (n=32)		
Post	0,69 \pm 0,25	0,75 \pm 0,26	0,06	0,483

Table 5 shows that the comparison of diaper rash inflammatory signs scores between the Aloe vera and VCO intervention groups did not differ significantly on either the 1st, 3rd, or 5th day of intervention. This is shown by the p-value of the Mann-Whitney test, each of which is above 0.05 ($p > 0.05$), namely 0.483. This insignificant difference can also mean that Aloe vera and VCO have the same effectiveness in healing inflammatory diaper rash, which is relatively similar.

DISCUSSION

The change in the level or degree of diaper rash is due to the administration of aloe vera, which functions to moisturize and nourish the skin. Aloe vera also has anti-inflammatory and antimicrobial properties, so it can reduce the severity of diaper rash. Similar results regarding the efficacy of aloe vera in diaper rash were also shown by Heidari et al. If diaper rash is severe in children aged 6–18 months, you can give aloe vera ointment. The impact of aloe vera treatment on diaper rash is due to the thromboxane content and cyclooxygenase derivatives in it, which have anti-inflammatory properties (Heidari, Parizad, Shirazi, Alinejad, & Badelbuu, 2020). Regarding its ability to speed up the treatment of diaper rash, aloe vera in various

preparations is widely offered on the market, both in the form of ointment, gel, and cream.

The results of this research also show that there is a comparison of scores indicative of diaper rash inflammation between the length of time of Aloe vera intervention. This comparison represents the effectiveness of aloe vera in treating diaper rash. The average score of inflammatory symptoms of diaper rash decreased according to the time of administration of aloe vera, which shows that the application of aloe vera is efficient in treating diaper rash in toddlers. Aloe vera's ability to treat diaper rash has also been demonstrated in several previous studies, such as research by Panahi et al., Hamdanah, and Murni(Hamdanah, 2021).

Aloe vera can treat diaper rash because it has mucopolysaccharides, which function to protect skin moisture, so it can prevent the skin from irritation due to using diapers. 20 Not only does it have a moisturizing effect, but mucopolysaccharides can also stimulate fibroblasts, which produce collagen and elastin, so that the skin becomes more elastic (Atikasari, Malik, & Widayati, 2021). For Panahi et al., the mechanism of the effect of treating diaper rash by administering Aloe vera is related to the anti-inflammatory and antimicrobial properties of this plant (Panahi et al., 2020). Aloe vera can stimulate the formation of new skin with cooling, refreshing, and moisturizing effects. Aloe vera can also increase the body's immunity (Ghanipour Badelbuu et al., 2019). Aloe vera can also treat diaper rash because it is not only antimicrobial and anti-inflammatory, but it also has a moisturizing and nourishing effect on the skin. Aloe vera also has antioxidant properties, so it can speed up the treatment process. The moisturizing impact of Aloe vera can repair the epidermal barrier so that it can limit the penetration of irritants and allergies that can stimulate eczematous lesions. Aloe vera gel contains water, glucomannan and acemannan, carboxypeptidase, magnesium, zinc, calcium, glucose, cholesterol, salicylic acid, gamma linoleic acid, vitamins A, C, and E, saponins, lignin, sterols, and amino acids (Atikasari et al., 2021). Aloe vera also has antithromboxane A2, which has the function of increasing blood flow to injured cells and resulting in faster wound healing (Boediardja, 2016).

Identification of the accelerated healing process of diaper rash before and after administration of VCO can be seen from the score of inflammatory signs of diaper rash, which tends to decrease. In the three days of observation, the diaper rash inflammatory sign score, which was originally high on day 1, namely 2.36, fell to 1.53 on day 3 and fell again to 0.69 on day 5. The decrease in the average score of diaper rash inflammatory signs between these times was all significant ($p = 0.000$). The process of accelerating the healing of diaper rash by VCO was also shown in Susanti's research: before being given VCO, 43% of babies aged 0–2 years each experienced moderate and severe diaper rash, and after being given VCO twice a day for 7 days, the number of babies with moderate diapers was reduced to 39%, while severe diapers were reduced to 8% (Susanti, 2020). Meliyana and Hikmalia's research on toddlers at the Flamboyan Posyandu Karangjaya Pedes Community Health Center also reported that giving VCO can speed up the treatment of diaper rash, as indicated by the reduction in the number of toddlers who previously experienced grade 1 and 2 diaper rash by 8 toddlers each before giving VCO after being given it. VCO for 4 days in 2 administrations, namely morning and evening, 6 toddlers with grade 1 diaper rash and 1 toddler with grade 2 diaper rash were declared cured (Meliyana, 2018; Ramadhani, Hotimah, Agusti, Toibah, & Septiyorini, 2022).

The degree of diaper rash is gradually decreasing because VCO can speed up the process of treating diaper rash by containing saturated fatty acids, most of which are medium-chain triglycerides (MCT), which have antimicrobial and antibacterial properties. The use of VCO is useful for children's health, which in this case is to cure diaper rash (Jennifa, Ba'diah, & Purwaningsih, 2014; Silaban, Nasution, Juwita, A'yuni, & Fatmala, 2022). The natural moisturizers listed in VCO and MCT easily enter the inner layer of the skin, so they can maintain skin elasticity (Silaban et al., 2022).

VCO can treat diaper rash because it has active compounds including phenol, melamine, squalene, sterols, tocopherol, and vitamin E, all of which are useful in repairing damaged skin cells through an antioxidant mechanism, namely by neutralizing free radicals, so that it can reduce and

minimize residual redness on the skin. And it can protect the skin from irritation (Firmansyah, Asnaniar, & Sudarman, 2019). Application of VCO after bathing can refresh the skin condition because VCO also has antimicrobial activity, so tissue tolerance can be maintained. The antimicrobial properties of VCO are obtained from median-chain triglyceride (MCT) or longer-chain fatty acids, which are converted into free fatty acids (FFA) so that they can limit the growth of various microorganisms such as germs, fungi, yeast, and viruses (Cahyati, Idriansari, & Kusumaningrum, 2015). Giving VCO can treat diaper rash because of the lauric acid content in MCT. Lauric acid that enters the body will be converted into monolaurin, which has the function of protecting the body's immune system and repairing damage to cells, body tissue, and skin, including skin damage caused by diaper rash (Susanti, 2020).

CONCLUSION

There is no difference in the effectiveness of administering aloe vera and VCO in accelerating the healing process of diaper rash. This insignificant difference can also mean that aloe vera and VCO have the same effectiveness in healing inflammatory diaper rash.

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