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Aloe Vera effectiveness for Perineal Wound Healing for Post Partum Mothers

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ABSTRACT:

Background: Perineal rupture is the cause of postpartum maternal bleeding. Postpartum hemorrhage is the main cause of 40% of maternal deaths in Indonesia. One way of natural treatment is by giving aloe vera which can speed up the wound healing process.
Purpose: This study aims to determine the effectiveness of aloe Vera as a wound medicine on the perineum of postpartum women.
Methods: This type of research was quantitative research with a quasi-experimental approach. The subjects of this study were mothers who experienced I and II degree perineal rupture in the Karang Anyar Health Center Work Area, South Lampung as many, a sample of 51 respondents. Data obtained from questionnaires. Data analysis used for univariate and bivariate analysis were independent t-test.
Results: The data showed that the average score of perineal wound healing due to the use of aloe vera was 4.72, with a standard deviation of 1.815. while the average score of perineal wound healing that did not use aloe vera was 7.35, with a deviation of 2.545. There is a difference in the effectiveness of using aloe vera on perineal wound healing in postpartum mothers at Karang Anyar Health Center, South Lampung with P-value = 0.026..
Conclusion: The use of aloe vera was very effective for healing perineal wounds in postpartum mothers and could be used as an option in accelerating the healing of perineal wounds.

Keywords: *Aloevera; Perineum; Rupture; Postpartum*

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BACKGROUND

The quality of childbirth is influenced by several things. One of them is the damage caused by an episiotomy on the genital organs because it can cause pain (Carroli & Mignini, 2009). Pain in the perineum can cause stress. Some of its derivative effects are sleep disturbances, fatigue, anxiety. The next result is a disturbance in the emotional relationship between mother and baby, maternal movements such as sitting, walking, and lifting the baby in the wrong position for breastfeeding, and the inability to care for the baby (Apurva et al., 2016; Golezar, 2016; Khasanah et al., 2017).

Damage due to genital episiotomy in childbirth were one of many the hemorrhage. Postpartum hemorrhage is the main cause of maternal mortality as much as 40% in Indonesia (Jiang et al., 2015). This prevalence also occurs in Australia, reaching 20,000 mothers giving birth. In Asia, the perineum repercussion is up to 50% (Anwar et al., 2015; Dinas Kesehatan Provinsi Lampung, 2019).

Injuries from childbirth are common. Many efforts are recommended to treat wounds so that they heal quickly. Basic care such as maintaining the cleanliness of the perineum, keeping the wound dry up to both non- and pharmacological treatments (Steen & Cummins, 2016). Pharmacological treatments include cryotherapy, laser therapy, electrical stimulation, acupuncture, and pelvic floor exercises but those are not enough. In addition, the treatment of these wounds can use herbal remedies. Several herbal plants are used such as lavender, olive, turmeric, cryotherapy and aloe vera. The act of using aloe vera is reported as the most effective method in healing and reducing episiotomy pain (Abbas et al., 2015; Delaram & Dadkhah, 2015).

Aloe vera has long been known to have properties for health, beauty care, and skin care. Aloe vera leaves have three layers namely; 1) the inside contains a clear gel containing 99% water and the rest consists of glucomannan, amino acids, lipids, sterols, and vitamins; 2) the middle layer contains yellow latex with a bitter taste and contains anthraquinones and glycosides; and 3) a thick outer layer containing 15-20 cells called fruit skin which functions as a protector and synthesizes carbohydrates and proteins and inside the skin there are bundles of vessels that carry substances such as water (xylem) and starch (phloem) (Holden et al., 2019).

A study comparing the antibiotic content of aloe vera with standard antibiotics such as methicillin, bacitracin, novobiocin, and erythromycin showed that aloe vera gel was effective up to 75.3% gram of isolated bacteria including staphylococcus aureus, staphylococcus epidermis, streptococcus pyogenes and gram-negative bacteria while standard antibiotics were able to up to 100% gram of bacteria. Thus, aloe vera leaf gel is not effective for all positive and negative bacteria (Emilda, 2017).

Based on the results of a preliminary survey conducted in the Work Area of the Karang Anyar Health Center, South Lampung, the average monthly deliveries were 140-150 deliveries. The survey results in December 2020 there were 148 spontaneous vaginal deliveries, 82 mothers (55.4%) with a perineal tear of degree 1, 22 women (15%) experienced a second degree perineal tear, while 44 other women (29.7%) did not experience a perineal tear, there were 30 women with longer perineal wound healing, including women who felt pain after giving birth so that mothers were reluctant to move, because the reproductive organs change, causing pain when urinating and defecating so that the mother becomes afraid and uncomfortable. Based on the above background, the researchers are interested in conducting further research on "Effectiveness of the Use of Aloe Vera (Aloe vera) on the Healing of Perineal Wounds in postpartum mothers in the Karang Anyar Health Center, South Lampung".

OBJECTIVE

The objective of this study was to determine the effect of aloe vera on the healing of perineal wound in post-partum mothers

METHODS

The type of research used in this study was quantitative with a quasi-experimental approach, namely a study by conducting experimental activities that aim to determine the symptoms that arise as a result of certain treatments or experiments (Notoatmodjo, 2012). For group Treatment (given aloe vera) with a dose of 3cc/1 teaspoon every 8 hours or 2 times a day for 5 days. For make aloe vera gel, one aloe vera tree, cut/sliced and peeled, then take the gel inside tree thunk. For group control no giving anything.

Inclusion Criteria 1) Postpartum mother with perineal rupture grade I and grade II 2) Postpartum mothers visit the first day until the fifth day postpartum 3) Willing to be a respondent and have signed the consent form Exclusion criteria 1) Postpartum mothers with complications

This research conducted in the Karang Anyar Health Center, South Lampung. While the research is approved with ethical clearance no. 1865 EC/KEP-UNMAL/VI/2021. a Post-test Only Control Group Design. In this design, neither the experimental group nor the control group were selected randomly. In this design, both the experimental group and the control group are compared. The experimental class received treatment (given aloe vera) while the control class did not receive treatment (was not given aloe vera). The Post-test Only Control Group Design scheme is shown in table 1 as follows:

Table 1. Post Test Scheme

Post-test Only Control Group Design Scheme	Treatment	Post-Test
Experiment	X	O
Control	-	O

The independent variable in this study was aloe vera administration, while the dependent variable in this study was perineal wound healing. The total population in this study were mothers who experienced perineal rupture of degree I and degree II in the Work Area of the Karang Anyar Health Center, South Lampung in December 2020 as many as 104 respondents. The sample in this study were mothers who experienced perineal rupture of degree I and degree II in the Karang Anyar Health Center Work Area, South Lampung in December 2020 as many as 51 respondents, with 26 respondents from the experimental group and 25 respondents from the control group.

A tool to assess perineal wound healing using the REEDA scoring system using disposable paper tapes (disposable paper tapes) with a length of 4 cm marked with 0.25 cm for each part. When the mother is tilted left or right, disposable paper tapes are placed perpendicular to the line of the perineal wound so that a centimeter size can mark the wound (Winarsih et al., 2019).

A scoring system to evaluate wound healing in the postpartum period. REEDA tool, this tool is to assess redness, edema, ecchymosis (purplish patch of blood flow), discharge, and approximation (closeness of skin edge) associated with perineal trauma after delivery. REEDA assesses five components of the healing process and perineal trauma for each individual (Eghdampour et al., 2013a; Grimes et al., 2014).

Table 2. The Characteristics of Postpartum Mother Treated with and without Aloe Vera

Score	*Redness*	*Edema*	*Ecchymosis*	*Discharge*	*Approximation*
0	None	None	None	None	None
1	<0.25 cm due to laceration process on both sides	<1 cm due to perineal laceration	<0.25 cm on both sides (0.5 cm on one side)	Serum	< 3 mm to 3 mm on skin wide
2	< 0.5 cm on both sides	From a 1 cm to 2 cm laceration on the perineum and/or vulva	The range between 0.25 cm to 1cm on both sides (0.50 cm on one side)	Serosanguineous	The skin and subcutaneous fat are spaced
3	>0.5 cm on both sides	In lacerations > 2 cm in the perineum and/or vulva	> 1 cm on both sides (2cm on one side)	Bloody, purulent	There are gaps among the skin, subcutaneous fat, and fascia

Source: (Sushen et al., 2017)

The REEDA scale is read that a scale of 0 means that wound healing is said to be good; a scale of 1 to 2 means that wound healing is moderate; and a scale of 3 means poor wound healing. Data were obtained through direct observation of patients who were given treatment using aloe vera at a dose of 3cc/1 teaspoon every 8 hours 2 times for 5 days.

Research ethics is carried out by researchers by applying to the ethics committee of Malahayati University, Bandar Lampung. The ethics committee approved to continue research with the approval letter number 1865 EC/KEP-UNMAL/VI/2021

RESULT

Table 3. The Characteristics of Postpartum Mothers treated with and without Aloe Vera

No	Respondents' Characteristic		Observation Group (experiment)		Observation Group (control)		P-Value
1	Age	20 – 35 years	24	96.0	24	92.3	0.003
		> 36	1	4.0	2	7.7	
2	Education	Junior High School (SMP)	11	44.0	3	11.5	0.000
		Senior High School (SMA)	4	16.0	23	88.5	
3	Parity	1 - 3	23	92.0	25	96.2	0.000
		>3	2	8.0	1	3.8	
		<17kgs/m^2	0	0.0	0	0.0	
4	IMT	18.5 – 25.0kgs/ m^2	0	0.0	0	0.0	
		25.1-27.0kg/ m^2	20	80.0	21	80.8	0.017
		>27.0kg/ m^2	2	8.0	3	11.5	
5	Baby's weight	<2500 gram	0	0.0	0	0.0	40
		>2500 gram	25	100	26	100	

Table 3 states that there are 25 participants (respondents) as the experimental group. Participants in the experimental group ranged in age from 20 to 35 years (96.0%). Participants' education was junior high school (44.0%) with parity 1 to 3 (92.0%), with normal BMI 80.0% and baby's weight > 2500 grams (100%). While in the control group,

there were 26 participants. The education of the participants was high school (88.5%) with parity 1 to 3 (96.2%). Participants aged between 20 to 35 years (92.3%), with normal BMI 80.8%, and infant weight > 2500 grams (100%).

Table 4. Perineal Wound Healing is given by Aloe Vera to Postpartum Mothers

Variable	N	Mean	Median	SD	Min.	Max.	95% CI
perineal wound healing given aloe vera	25	4.72	5.00	1.815	2	8	3.97 - 5.47

Table 4 is the result of the research data. Table 3 shows that wounds treated with aloe vera obtained a mean healing score of 4.72, a median score of 5.00, and a standard deviation of 1.815. Table 3 also says that wound healing takes 2 days and the longest time is 8 days. Interval estimates say that the up to 95% confidence level of healing with aloe vera is in the range of 3.97 to 5.47. Next is the P-value stating that age (0.003), education (0.000), parity (0.000) BMI (0.017), and baby's weight (0.040)

Table 5. Healing of Perineal Wounds not given by Aloe Vera to Postpartum Mothers

Variable	N	Mean	Median	SD	Min.	Max.	95% CI
perineal wound healing given aloe vera	26	7.35	8.00	2.545	4	12	6.32 - 8.37

Table 5 is the data from the group study that was not treated with aloe vera. Table 5 shows that the average score of wound healing is 7.35, with a median score of 8.00, and a standard deviation of 2.545. Table 5 shows that the perineal wound healing time is at least 4 days and the longest perineal wound healing time is 12 days. The results of the interval estimation also said that the 95% confidence level of perineal wound healing that was not given aloe vera was between 6.32 to 8.37.

Table 6. The Effectiveness of Using Aloe Vera (Aloe Vera) on the Healing of Perineal Wounds in Postpartum Mothers in the Work Area of Karang Anyar Health Center, South Lampung

Variable	N	Mean	SD	SE	P-value
Perineal wound healing is given aloe vera	25	4.72	1.815	0.363	0.026
Healing perineal wounds that are not given aloe vera	26	7.35	2.545	0.026	

Table 6 is a t-test calculation. Table 6 states that the t-test assumes the variance of the two groups is the same and the t-test assumes that the variance of the two groups is different. The test results used can be seen from the variance similarity test through the Levene test. If the value of p<alpha then the variance is different, and if the value of p>alpha then the variance is said to be the same as the alpha value of 0.05. Levene test results show that the P-value for F Lavene is 0.26, meaning that the variance of the two groups is not the same, because the P-value > alpha. So, the t-test used is on unequal variances (it is not assumed that the variance is the same). The results of the above study obtained a P-value = 0.026, which means at an alpha of 5% (0.05) it can be concluded that there is the effectiveness of using aloe vera on perineal wound healing in postpartum women.

DISCUSSIONS

The results of statistical calculations showed that postpartum mothers who were treated with aloe vera obtained an average score of 4.72, a mean score of 5.00, and a standard deviation of 1.815. Furthermore, the perineal wound healing time requires the fastest time for 2 days and the longest for 8 days.

The results of the study are in line with research (Eghdampour et al., 2013b) the results obtained that the average REEDA after being given for 5 days showed a significant difference between the Aloe vera group and the ointment group (p = 0.001), regarding redness 5 days after the intervention showed a significant difference. significant between groups with (p=0.001). The research of Nazari et al (2019) also stated that the use of Aloe Vera gel, compared to normal saline, could reduce pain and accelerate the healing of episiotomy ulcers without side effects.

Theoretically, perineal wounds were injuries that occur due to a tear in the birth canal either due to rupture or due to an episiotomy during delivery of the fetus (Fatimah et al., 2019). Perineal rupture is a tear that occurs in the perineum during childbirth (Winkjosastro & Hanifa, 2005). Wound healing is the process of replacing and repairing the function of damaged tissue. In mothers who have just given birth, many normal physical components in the postnatal period require healing with varying degrees, wound healing is a quality of tissue life, this is also related to tissue regeneration. According to (Setiabudi & Wijaya, 2008), aloe vera liquid contains the main elements, namely aloin, emodin, gum, and other elements such as essential oils (Winarti et al., 2005) the efficacy of aloe vera can heal wounds, kristophan acid contained in aloe vera promotes healing of damaged skin wounds.

Aloe vera conceives 75% active ingredients: vitamins, enzymes, minerals, sugars, lignin, saponins, salicylic acid, and amino acids. Aloe vera conceives antioxidants vitamins A, C, and E. It also contains vitamin B12, folic acid, and choline. Antioxidants neutralize free radicals. The enzymes contained include 8 enzymes e.g., aliiase, alkaline phosphatase, amylase, brady kinase, carboxypeptidase, catalase, cellulase, lipase, and peroxidase. Brady kinase assists to reduce excessive inflammation when applied to the skin, while others help in the breakdown of sugar and fat. The minerals contained include calcium, chromium, copper, selenium, magnesium, manganese, potassium, sodium, and zinc. They are essential for the proper functioning of various enzyme systems in different metabolic pathways and only a few are antioxidants. The sugars contained include monosaccharides (glucose and fructose), and polysaccharides (glucomannan/polymannose) (Lestari & Andiani Budi, 2017; Pegu & Sharma, 2019).

These are derived from the mucus layer of plants and are known as mucopolysaccharides. The most prominent monosaccharide is mannose-6-phosphate, and the most common polysaccharide is called glucomannan. Acemannan is a prominent glucomannan. Recently, a glycoprotein with hypoallergenic properties called alprogen, and a new anti-inflammatory compound, C-glucosyl chromone, has been isolated from aloe vera gel. This anthraquinone supplays12 anthraquinones, which are phenolic compounds traditionally known as laxatives. Aloin and emodin act as an analgesic, antibacterial and antiviral agents. These fatty acids supply 4 plant steroids; cholesterol, campesterol, -sitosterol, and lupeol. All of these substances have anti-inflammatory action. Besides lupeol also has antiseptic and analgesic properties. The hormones contained include auxin and gibberellins which aid in wound healing and have anti-inflammatory action. As well as other content, namely 20 of the 22 amino acids needed by humans and 7 of the 8 essential amino acids. It also contains salicylic acid which has anti-inflammatory and antibacterial properties. Lignin, an inert substance, when administered in a topical preparation, enhances the penetration effect of other substances

into the skin. Saponins which are soapy substances make up about 3% of the gel and have cleansing and antiseptic properties (Novyana & Susianti, 2019; Surjushe et al., 2008).

In the process of wound recovery, glucomannan, a polysaccharide-rich in mannose, and gibberellins, a growth hormone, interact with growth factor receptors on fibroblasts, thereby stimulating their activity and proliferation, increasing collagen synthesis. Aloe vera gel not only increases the collagen content of the wound but also changes the collagen composition (more type III) and increases the degree of collagen cross-linking. Collagen is the main protein of the extracellular matrix and is a component that ultimately contributes to wound healing, thereby accelerating wound contraction and increasing the strength of the resulting scar tissue (Asri et al., 2018).

Protease enzymes with glucomannan could also eliminate bacteria. In addition, the antibacterial and antifungal effects of aloe vera can stimulate fibroblasts for wound healing. These elements in aloe vera when combined would be able to stimulate macrophages that control the immune system. Aloe vera mucus also consists of several glycoproteins, which prevent pain inflation and accelerate repair. Likewise, aloe vera was composed of polysaccharides, which stimulate wound healing and skin growth. The mucus from this plant could be used for the treatment of internal and external wounds. Aloe vera mucus includes several compounds such as vitamin E and vitamin C and some amino acids, which could play an important role in accelerating wound healing in such a way that experiments have shown that vitamin C can play a role in increasing collagen production and preventing the synthesis of DNA strands, as well as vitamins. E is a powerful antioxidant in wound healing. Aloe vera mucus has an enzymatic system of antioxidants such as glutathione peroxidase and superoxide dismutase, which accelerate wound healing by neutralizing the effects of free radicals generated at the wound site and with anti-inflammatory properties (Furnawanthi, 2010).

Based on the explanation above, the authors argue that the administration of aloe vera could provide vitamin E nutrition to support the perineal wound healing process to run well. Perineal lacerations that occur during vaginal delivery will require suturing. After suturing, it is necessary to examine the perineal wound to assess the results of the sutures that may cause problems during the postpartum period. Therefore, it is necessary to treat wounds properly so as not to cause problems for the mother after giving birth. The results of the study found that wound healing that was not given aloe vera (aloe vera) resulted in the mean value or average value of wound healing is 7.35, with a median value of 8.00, and a standard deviation of 2.545. The results of the study also found that perineal wound healing obtained a minimum wound healing time of 4 days and a maximum time for perineal wound healing that was 12 days.

In line with (Indria Nuraini, 2017) on the Use of Herbs in Healing Perineal Wounds and Cesarean Section Wounds. The results of the study the impact of aloe vera and calendula on episiotomy healing in primiparous women, it was found that between the control and experimental groups there was no statistically significant difference regarding the intervention of demographic and other variables. However, it showed a statistically significant difference between the control and experimental groups in the perineal wound healing process seen from redness, edema, ecchymosis, discharge, and scale of approach (REEDA). compared to those who were not given aloe vera, this proves that the efficacy of aloe vera can be used as an alternative for wound healing. Postpartum care is the care for mothers who have just given birth until the uterus returns to its pre-pregnancy state. The function of postpartum care is to provide facilities so that the physical and psychological healing process takes place normally, observes the process of the uterus returning to its normal size, helps mothers to be able to give breast milk, and gives instructions to mothers in caring for their babies. Wound healing is the process of

replacing and repairing the function of damaged tissue. In mothers who have just given birth, many normal physical components in the postnatal period require healing at various levels. Immediately after delivery, placental implantation scars are rough and protrude into the uterine cavity. The protrusion is approximately -7.5 cm in diameter. In addition, from the uterine cavity, a secret fluid called lochia comes out (Suherni, 2009)

The results of the bivariate analysis obtained P = 0.000 which means that there is the effectiveness of using aloe vera (Aloe vera) on perineal wound healing in postpartum women in the Karang Anyar Health Center, South Lampung. (Santika et al., 2020) research on the effect of giving boiled eggs with accelerating perineal wound healing. The average perineal wound before being given the intervention of consuming boiled chicken eggs was obtained Mean 6.85 Min 3 Max 9 and Standard Deviation 1.694, after being given the intervention the consumption of boiled chicken eggs Mean 2.35 Min 1 Max 4 and Standard Deviation 0.813. The statistical test results obtained a P-value = 0.003 (<0.05), which means that there is an effect of giving boiled eggs with accelerating perineal wound healing at BPS Nurhasanah, Str., Keb Gudang Lelang, Bandar Lampung City in 2019.

(Indria Nuraini, 2017) found that between the control and experimental groups there was no statistically significant difference regarding the intervention of demographic variables However, the results of statistical calculations showed a significant difference between the control and experimental groups in the perineal wound healing process in terms of the REEDA approach scale. Thus giving aloe vera can help accelerate wound healing and speed up the process of replacing and repairing damaged tissue function. Aloe vera mucus which also contains several glycoproteins can prevent pain inflation and accelerate repair so that skin tissue heals quickly.

This healing period is important for health workers to pay attention to always monitoring because the implementation is not optimal causing postpartum mothers to experience various problems and even develop into complications, such as puerperal sepsis. When viewed from the cause of postpartum maternal death, infection is the second most common cause of death after bleeding, so health workers pay high attention to this period. The further impact is on the welfare of the babies who are born because the babies do not get maximum care from their mothers. Thus, infant morbidity and mortality will also increase (Sulistyawati & Ari, 2009). One of the natural remedies for this case is the use of aloe vera which can speed up the healing process. Aloe vera is traditionally used as a wound medicine because the leaves of the aloe vera plant contain saponins and flavonoids, and the leaves contain tannins and polyphenols. Saponins are capable of cleaning wounds and tannins are effective in preventing wound infections because they have antiseptic properties, while flavonoids and polyphenols are useful as antiseptics. Another advantage of aloe vera in wound healing is that aloe vera has antifungal, antiviral, and antibacterial activity against skin infections. Aloe vera can also reduce perineal pain through anthraquinone, allantoin, and other polysaccharides. This compound will inhibit histamine and bradykinin this can inhibit the formation of prostaglandins and ultimately prevent the inflammatory process and reduce the sensation of pain (Dewi et al., 2020).

Aloe vera contains derivatives in the form of anthracene hydroxyl including aloins A and B2 with an amount of 25-40% chromone compounds and their derivatives such as aloe resins A, B2, and C (Novyana & Susianti, 2019; Surjushe et al., 2008). Studies of aloe vera having several standard antibiotics (methicillin, bacitracin, novobiocin, and erythromycin) showed that aloe vera gel was effective against gram-positive bacteria by 75.3% of the bacteria isolated including staphylococcus aureus, staphylococcus epidermis, streptococcus pyogenes, and gram-bacteria negative. The bacteria isolated were 100% including Pseudomonas aeruginosa, while aloe vera leaves were not effective

against all gram-negative and gram-positive bacteria (Dewi et al., 2019). The moisturizing effect of aloe vera has been well proven in the form of topical products.

CONCLUSIONS

Wounds on the perineum were an inconvenience for pregnant women and many want wound healing in a natural way. Giving aloe vera is one of the natural ways to heal perineal wounds with a dose of 3cc/1 teaspoon per 8 hours 2 times for 5 days. Contains 75% active ingredients, proven to be effective in accelerating the healing of postpartum mothers' perineal wounds.

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