



Analysis of Red Betel Leaf Tests As A Natural Anti-Infection In Post Partum Mothers

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ABSTRACT

Background: Incidence of infection contributes to maternal mortality. Innovative efforts to treat infection in postpartum mothers continue to be made, including non-pharmacological techniques. The local wisdom of red betel leaves is believed by the community to be able to handle it. The true efficacy of this extraordinary red betel leaf deserves further investigation. The purpose of this study was to assess the effectiveness of red betel on perineal wound healing in postpartum mothers.

Methods: This study used the Quasi Experiment with Control Group Design method. The study was conducted on 80 postpartum mothers with perineal wounds degrees 1 to 3. 40 women were included in the intervention group who were given red betel ointment made by researchers from 2 hours to 7 days postpartum. 40 people as the control group were given perineal wound care according to standard. Assessment of wound healing was carried out every day until the 7th day postpartum. Statistical tests used the dependent and independent t-tests to examine differences in healing scores in the two study groups.

Results: There was an increase in the average perineal wound healing value in the intervention group which was higher and there was an increase in the average healing value every day, starting from the first day (mean = 9.25), the second day (mean = 11.55), and the seventh day (mean = 12.65) compared to the control group, p value <0.001. On the third day postpartum, the intervention group had the maximum healing value (100%) compared to the control group (52.5%).

Conclusion: Giving red betel leaf formulation to postpartum mothers with perineal wounds indicated that the results were optimal in increasing perineal wound healing, so that the incidence of infection could be minimized.

Keywords: Red Betel; Infection; Perineal Wounds; Postpartum

BACKGROUND

Maternal mortality in Indonesia can occur due to infection during the puerperium (Handayani et al., 2015). The puerperium period occurs after the delivery period until 6 weeks after delivery which is the time for healing and the return of the reproductive organs to their pre-pregnancy state (Hartaty et al., 2020a). During the recovery period, the mother will experience many changes both physically and psychologically, most of which are physiological. This period is quite an important period for health workers to always monitor because implementation that is not optimal can increase maternal mortality such as bleeding, infection or complications during the puerperium (Hartaty et al., 2020a).

In addition, during the postpartum period, there are generally many problems or complaints that accompany postpartum mothers, including breastfeeding, maternal independence, suture pain, suture wound care, causing discomfort for the mother in going through the puerperium (Hartaty et al., 2020b). Postnatal education plays a role in the learning process provided by health workers to mothers and families during the postpartum period in order to increase mothers' knowledge and ability to adapt to maternal changes that occur during the postpartum period, both physical and psychological changes (Grimes et al., 2014).

If the perineal tear during the puerperium is not treated properly, it will increase the risk of postpartum infection cases (Damarini et al., 2013b). Infection is the third leading cause of maternal death during 2010-2015 in Indonesia after bleeding and hypertension. The maternal mortality rate has been known since ancient times and has not changed much (Nan et al., 2020).

Injury to the birth canal is one of the entry points for pathogenic germs that can cause infection. This wound is certain to occur in every delivery. The average vaginal delivery in Asia occurs in 50% of cases of perineal rupture during labour (Indrayani et al., 2018; Indrayani & Tuasikal, 2020). This figure is estimated to reach 6.3 million in 2050. As many as 50% of perineal rupture events in the world occur in Asia (Nan et al., 2020). In Indonesia perineal lacerations are experienced by 75% of women giving birth vaginally. In 2013 found that out of a total of 1,951 spontaneous vaginal births, 57% of mothers received perineal sutures (28% due to episiotomy and 29% due to spontaneous tears).

Wounds in perineal rupture are local wounds, proper care is needed to avoid systemic spread of infection. Improper perineal wound care can lead to infection (Wiseman et al., 2019a). The condition of the perineum that is affected by lochia and is moist will greatly support the proliferation of bacteria which can cause infection in the perineum.

Non-pharmacological methods which are one of the innovative efforts that are believed to reduce the incidence of infection during the puerperium need to consider the structure of society in Indonesia (Adelekan et al., 2021; Damarini et al., 2013b; Nan et al., 2020; Wiseman et al., 2019b). Problem solving and the current situation of public health status in Indonesia are still based on a logical and rational approach, so that health problems are becoming increasingly complex (Satrianegara et al., 2021). When a rational

approach feels deadlocked in dealing with health problems, it is necessary and important to raise local wisdom as a way to solve it, one of which is the use of herbal plants that are believed to be passed down by people in Indonesia, such as the use of red betel leaves.

Red betel leaf extract is known to have chemical compounds that have antiseptic and antibacterial effects (Damarini et al., 2013b). According to research red betel leaf extract is better than green (Amini et al., 2022). The red betel plant contains chemical compounds such as β -avonoids, alkaloids, saponins, tannins, and essential oils. Essential oil from betel leaves contains flying oil (betlephenol), sesquiterpene, starch, abovee, sugar and tanning substances and chavicol which has the power to kill germs, anti-oxidation and fungicide, anti-fungal.

A quasi-experimental study on 32 respondents who compared the effectiveness of binahong boiled water and red betel as vaginal cleansing water on perineal wound healing, found that red betel water proved to be effective in healing perineum wounds faster than binahong boiled water Previous study have stated that red betel is more effective than iodine in the treatment of perineal wounds during the postpartum period (Damarini et al., 2013a).

Various studies on the effectiveness of using red betel have been carried out (Damarini et al., 2013a; Darulis et al., 2021; Hastuty & Ariska, 2022; Karimah et al., 2019), but the right formulation has not been found in the form of an ointment so that it is easy to use for perineal wound healing in postpartum mothers.

OBJECTIVE

This study aims to assess the effectiveness of red betel ointment on the healing of perineal wounds grades 1 to 3 in postpartum mothers.

METHODS

This was study with a quasi-experimental design using a control group. This research was conducted in 2 stages. The first stage was the formulation of red betel ointment using 6 months old red betel which was taken specifically from the betel farming area in Lampung. Red betel aged 6 months is proven to contain compounds that can provide antibacterial, antifungal and antiseptic effects. Furthermore, the betel leaf is made into an ointment by a pharmacologist. The second phase is a trial of red betel ointment in postpartum women with grades 1-3 perineal wounds.

Sample selection was carried out using non-probability sampling through accidental sampling, namely using samples according to the inclusion and exclusion criteria who came to the research site. The process of determining the sample that goes into the intervention group and the control group is done by using a lottery. Calculation of the number of samples is done by using the calculation of the minimum sample size for which the total population is unknown, the number of samples obtained is 35 postpartum mothers. To achieve maximum results and to prevent possible lost follow-up, 80 postpartum mothers were taken as a sample and divided into 2 groups, 40 people in the intervention group and 40 people in the control group.

Inclusion and exclusion criteria for research respondents

The inclusion criteria for respondents from this study were postpartum women 2 hours postpartum at the study site, had perineal tears of degree 1.2 or 3, good nutritional status with BMI before pregnancy was 18.5-24.9 and no anemia, no complications of pregnancy and childbirth. While the exclusion criteria from this study were women with complications of pregnancy and childbirth, history of diabetes mellitus, perineal edema, experiencing sexually transmitted infections and mothers with possible allergies to red

betel ointment. Allergy assessment of red betel ointment was carried out before the research process. The red betel ointment was first smeared behind the respondent's ear and checked after 5 minutes for any allergic reactions such as itching and swelling (Brockow et al., 2019).

Assessment in the intervention group and the control group

The intervention group will be given standard education about perineal wound care (Hartaty et al., 2020b), and apply red betel ointment to the perineal stitches every day after cleaning the perineum from 2 hours to 7 days postpartum. Mothers are taught to apply red betel ointment to the stitches of the perineal wound. The control group was given standard midwifery care for perineal wound care such as how to care for the perineal wound, how to wash the perineum, change the pads immediately if they feel wet, do Kegel exercises and consume high protein foods. Assessment of wound healing was carried out by midwives on the first, third and seventh days postpartum. Assessment of wound healing is carried out by looking at indicators of wound healing using the REEDA standard (redness, edema, ecchymosis, discharge and approximation) (Khalefa & El-Saidy, 2018). For the healing rating scale used by REEDA and the researcher's modification, the value used for the healing scale is 0-15 points. The greater the REEDA value, it means that the healing of the perineal wound is getting better.

Ethical aspect in this research

Before being included in the group, each respondent had been explained about the research process and there was the possibility of being in the intervention group who would be given red betel ointment on their perineal wounds. Explanation is done before the birth process occurs. All respondents had signed an informed consent as a willingness to be a respondent in this study. The research process followed the Helsinki declaration standards for the use of humans as research subjects. Each respondent has the right to stop participating in the research as a subject at any time. This research has received a research ethics certificate from Respati University number 147/SK.KEPK/UNRI/IV/2022

Statistical analysis

Dependent test analysis and independent t-test were carried out to test the two study sample groups and see differences in the results of perineal wound healing in the two study groups.

RESULTS

Respondents in this study amounted to 80 people who were divided into two groups, namely the intervention and control groups.

Table 1. Respondent characteristic

Variable	Group				P-value
	Intervention		Control		
	n	%	n	%	
Age (year)					
1. 20-35	34	85	36	95	0.67
2. < 20, >35	6	15	4	5	
Education					
1. High (University)	25	62.5	28	70	0.63
2. Low-middle (≤Senior high school)	15	37.5	12	30	

Occupation					
1. Employment	12	62.5	28	70	1.00
2. Unemployment	28	37.5	12	30	
Parity					
1. Multiparity	30	75	30	75	0.80
2. Primiparity	10	25	10	25	
Grade of perineal laceration					
1. I	12	27.5	10	25	0.89
2. II	11	30	14	35	
3. III	17	42.5	16	40	

Based on table 1, most of the respondents from both groups were aged 20-35 years, highly educated, employed, multiparity and with third degree perineal injuries.

Table 2. Effect of Red Betel Leaf on Perineal Wound Healing in the Intervention and Control Groups

Variable	Group									
	Intervention					Control				
	Mean±SD	Min	Max	Mean rank	P-value*	Mean±SD	Min	Max	Mean Rank	P-value*
Perineal wound healing value-1 st day of postpartum day	9.25±2.69	5	12	1.00		7.90±1.33	6	12	1.28	
Perineal wound healing value-3 rd day of postpartum day	11.55±1.37	10	13	2.23	< 0.001	9.00±1.90	6	12	1.99	< 0.001
Perineal wound healing value-7 th day of postpartum day	12.65±0.48	12	13	2.78		9.80±1.65	7	13	2.74	

* The Friedman tests

Table 2 shows the average value of perineal wound healing before intervention (day 1) was 9.25 in the intervention group, increasing on day 3 of 11.55 and day 7 of 12.65. Friedman test results p-value <0.001, there is a difference in the average perineal wound healing rank between before the intervention, day 3 and day 7. In the control group, the results also showed that there was a difference in the average perineal wound healing rank between before the intervention, day 3 and day 7, but the mean rank value in the control group was lower than in the intervention group, especially on day 3 after the intervention was 1.99 in the control group compared to 2.23 in the intervention group.

Table 3. Conditions of increasing and/or decreasing perineal wound healing in the intervention and control groups

Parameters	Group					
	Intervention			Control		
	n	%	p-value*	n	%	p-value*
Perineum wound healing value on the first to third day of intervention						
- Negative different	0	0		1	2.5	
- Positive different	40	100	<0.001	21	52.5	<0.001
- Ties	0	0		18	45	
Perineum wound healing value on the first to third day of intervention						
- Negative different	0	0		2	5	
- Positive different	22	55	<0.001	23	57.5	<0.001
- Ties	18	45		15	37.5	

* The Wilcoxon t-tests

Table 3 shows that giving betel leaf ointment to the intervention group increased the healing value of the perineal wound optimally on the 3rd day after the intervention. In the control group, there was only an increase of 52.5% on the third day, even on the 7th day as many as 5% of mothers in the control group experienced a decrease in the perineal wound healing rate. In addition, it was found that 5% of postpartum mothers on the seventh day in the control group experienced a decrease in the value of perineal wound healing.

DISCUSSION

In this study it was found that giving red betel leaf ointment was effective in accelerating the healing of perineal wounds degrees 1, 2 and 3 in postpartum mothers less than 7 days after the puerperium and can decrease the possibility of infection. This study is in accordance with several previous studies which stated that red betel leaf compounds were effective in accelerating the healing of perineal wounds after childbirth (Alfiana et al., 2022; Damarini et al., 2013b; Emelda et al., 2021; Kyu et al., 2018; Stianto et al., 2018). It's just that most previous studies used boiled water from red betel leaves and had not yet formed an ointment with a measurable dose for how to use it. The use of red betel leaves for wounds on the skin has been done on animals before. This study states that red betel leaf preparations which have been extracted through a pharmacological process and given to the skin by episiotomy in mice have been shown to be effective in reducing inflammation in the skin, increasing the expression of vascular endothelial growth factors thereby accelerating the healing of skin wounds.

Red betel leaves have many ingredients that are very useful for healing perineal wounds, including containing arecoline in all parts of the plant which are useful for stimulating the central nervous and thinking power, increasing peristaltic movements. By

increasing peristalsis, it means that it can improve blood circulation so that the oxygen content also becomes better and really helps the wound healing process. The leaves contain eugenol which is able to eradicate the *Candida albicans* fungus, and is analgesic so that it can relieve pain in the wound. Meanwhile, the carvacrol content is disinfectant and antifungal so it can be used as an antiseptic to remove odor and vaginal discharge and prevent infection. The chemical constituents of essential oils in betel leaves act as antiseptics and deodorizers such as kadinen, kavikol, cineol, eugenol, carvanol and tanning substances (Damarini et al., 2013a).

Infection during the puerperium involves pathogenic anaerobic and aerobic microorganisms which are the normal flora of the cervix and birth canal or may also come from the outside. The most common cause (>50%) is *Streptococcus anaerobe*. *Staphylococcus aureus* is a type of germ that often causes infection during the puerperium (Karsnitz, 2013). *Staphylococcus aureus* is a normal flora found on human skin. Is a type of pathogenic bacteria that can cause infections and disorders of the skin (Karsnitz, 2013).

Red betel leaf extract can significantly inhibit the growth of *Staphylococcus aureus* bacteria using the disc diffusion method with Mueller Hinton Agar media (Damarini et al., 2013b). The antibacterial effect of red betel leaves is due to the presence of several compounds such as phenols which work to change the properties of bacterial cell proteins so that the permeability of the bacterial cell wall increases and the bacteria become lysed, flavonoids interfere with the integrity of the bacterial cell membrane, and alkaloids interfere with the constituent components of peptidoglycan in bacterial cells (Amini et al., 2022).

Several previous studies have carried out clinical trial tests on the effect of red betel on the healing of incisions in rats, it was found that red betel leaf extract had the highest effect to help speed up the healing time of incisions performed on rats, both excision and burn wounds (Lien et al., 2015; Lienert et al., 2018).

This research is still in micro capacity. However, this research is research for the application of health science and technology which has been able to formulate and create red betel leaf preparations in the form of an ointment that will be easily used by postpartum mothers with perineal wounds later. However, the samples tested were still relatively small, so further trials with larger samples were needed so that this preparation could be considered as a standard for perineal wound care in the future.

CONCLUSION

In conclusion from this study, red betel leaf extract which has been developed into an ointment has proven effective in accelerating the healing of perineal wounds grades 1, 2 and 3 and is able to prevent infection of the perineal wound. Midwives have an important role in facilitating and providing safe and effective care, so in order to optimize health services, especially for postpartum mothers, it is necessary to integrate services that are based on local wisdom and are proven to be safe, such as the use of red betel ointment to accelerate perineal wound healing, in addition to red betel ointment. Midwives are also obliged to provide education about healthy postpartum care, with the integration of these two things, the recovery of postpartum women will go well, this will also reduce morbidity and mortality during the postpartum period.

ACKNOWLEDGMENTS

Researchers would like to thank the Jakarta III Health Polytechnic and the Ministry of Health for providing funds for the implementation of this research. Acknowledgments

also go to the research location, namely the biochemistry laboratory of the Jakarta I Health Polytechnic and the independent practice of midwives in the East Jakarta area who have agreed to be the location for this research.

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