EVIDENCE BASED CASE REPORT (EBCR): THE EFFECT OF BETEL LEAF DECOCTION ON THE HEALING OF PERINEAL WOUNDS IN POSTPARTUM WOMEN

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Abstract **Background**: The postpartum period is a time for the restoration of the reproductive organs to their pre-pregnancy condition. One of the problems that often occurs in postpartum mothers is perineal rupture. Betel leaves are known to have chemical content that acts as an antiseptic and antibacterial drug, in addition betel leaves also contain chemicals as anti-inflammatories that are good for mothers who experience perineal wounds, which can help accelerate perineal wound healing.
Objectives: This study aimed to apply the administration of boiled betel leaves to postpartum women with second-degree perineal tears at the Rancaekek DTP Health Center.
Method: Systematic searching was conducted to find the best literature before implementing the intervention. The intervention was given to Mrs. R P3A0 postpartum with a second-degree perineal suture wound. The formula given was 25 grams of betel leaves added to 100 ml of water and boiled for 15 minutes. Then filtered and the boiled water was used to clean the vulva in the morning and evening. Perineal wound healing was evaluated daily using the REEDA questionnaire.
Results: The results of the first day's evaluation obtained a REEDA score of 9, day 2 score 4, day 3 score 3, and day 4 REEDA score 0 which means the wound healed. Thus, the healing of the perineal wound in Mrs. R took place in 4 days.. Betel leaf decoction is effective in accelerating the healing of stitches in Mrs. R.
Conclusion: The use of betel leaves decoction can be used as an effective alternative for perineal wound care.

Keywords: Betel leaves, Perineal wounds.

BACKGROUND

The postpartum period is a period that begins 2 hours after the birth of the baby until 42 days after birth. This period is the time for the recovery of the reproductive organs back to their pre-pregnancy condition.[1] During the postpartum period, the mother will experience a recovery process both physically and psychologically. One of the problems that often occurs in postpartum mothers is a tear in the birth canal or perineal rupture. The perineum is the surface of the lower pelvic opening located between the vulva and vagina. The perineum consists of the muscles and urogenital fascia and the pelvic diaphragm. The perineum is an important active supporting component for the pelvic organs. Its normal function is to protect and place the pelvic organs.[2]

The labor process can cause tears in the vagina and perineum which cause bleeding in varying amounts and a lot. Perineal laceration is a tear that occurs in the perineum during labor. Perineal lacerations can be classified according to the degree of laceration, namely degree I, degree II, degree III, and degree IV. A study conducted in England showed that 85% of women who give birth normally will experience perineal trauma. More than two-thirds of these women will require stitches.[3] Perineal trauma will affect the physical, psychological, and social well-being of women in the immediate and long-term postnatal period. Puerperal infections can be caused by birth canal wounds that do not heal properly.[4] Perineal infection can occur because the perineum is moist, making it a breeding ground for bacteria. Infection that occurs in perineal wounds can spread to the birth canal or urinary tract. Infection in perineal wounds will slow down the wound healing process because it can increase damage to the supporting tissue of the skin. This condition will worsen the degree of perineal wounds and their treatment.[4]

Betel leaves are known to contain chemicals that act as antiseptic and antibacterial drugs. In addition, betel leaves also contain chemicals as anti-inflammatories that are good for mothers who experience wounds, especially perineal wounds, which can help speed up wound healing and the healing process of perineal wounds.[5] Betel leaves contain EO, hydroxykavicol, clavicula, cavibetol, allypyrokatekol, cineole, caryopyllene, cadinene, estragol, terpennea, sesquiterpene, phenylpropane, tennin, diastase, and arecoline. The content of betel leaves such as kavicol and EO are antifungal and antibacterial. Among these contents, betel also has antibiotics, arecoline is useful for stimulating the central nervous system to increase peristaltic motion so that blood circulation in the wound becomes smooth, oxygen becomes more abundant, thus affecting faster wound healing. Based on these effects, betel can be used as a wound treatment.[4]

METHODS

Case overview

A postpartum mother, Mrs. R P3A0, gave birth 6 hours ago at the Rancaekek DTP Health Center. The history of delivery on 10/28/2024 at 23.02 WIB at the Rancaekek Health Center PONED was assisted by a midwife with a 2nd degree perineal tear. Stitching was performed using the running and subcuticular techniques. Complaints during the assessment at 6 hours postpartum were that the mother still felt pain in the stitches. The results of the vital signs examination showed BP 110/70, N 80x/minute, P 20x/minute, S 36.4 C. Physical examination was within normal limits. The vulva vagina showed red lochia discharge, 30 cc in quantity, the stitches had not dried, did not smell, there was no blood or pus discharge.

Problem formulation

The formulation of clinical questions using the case above is: is there a relationship between the use of boiled betel leaves and the healing of stitched wounds:

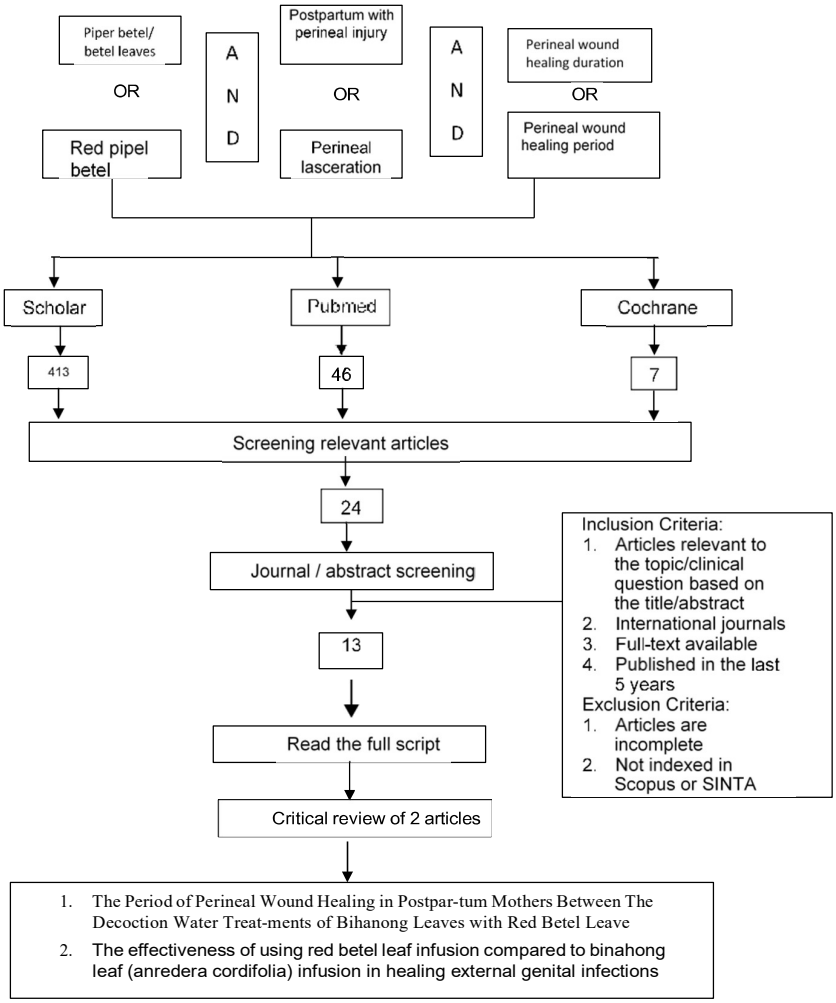
P (Population): Postpartum mothers with stitched wounds / postpartum with perineal lasceration / postnatal with perineal lasceration

I (Intervention): administration of boiled betel leaves / piper betel / piper betel leaves / red betel leaf / piper cocratum / red piper betel

C (Comparation): None / no comparison / other methods O (Outcome): Duration of perineal wound healing

Method

Literature search was conducted on Google Scholar, Pubmed, Cochrane, Sciencedirect, and Directory of open access journals using the terms “piper betel” and “perineal wound” and synonyms of related terms. The search results obtained a number of articles. The first review was made based on the title and abstract, articles published in the last five years, and the availability of full text. Then reviewed again based on the inclusion criteria that have been set. Based on a review of several articles, 2 articles were obtained that will be used in the application of this evidence-based case report.



No	Artikel	Research design	Level of evidence	Validity	Importancy	Applicability
1	Author: Nahdiyah K, Nur Khafidhoh, Triana SH, Riska IH. Journal: GHMJ (Global Health Management Journal) Title : The Period of Perineal Wound Healing in Postpartum Mothers Between The Decoction Water Treatments of Bihanong Leaves with Red Betel Leaves	Quasi-experiment post-test only without control group design	1b	The research design in this journal uses a Quasi experiment with a Randomized Controlled Trial approach. The research sample consists of 32 respondents taken using the accidental technique. The sample was divided into 2 groups, namely the group receiving binahong and the group receiving betel leaves. The study was conducted in the Gubug I health center work area. Perineal wound healing was assessed using the REEDA scale.	The average healing period for perineal wounds in the binahong group was 6 days, while the red betel group was 4.69 days. There was a significant difference in the healing period for perineal wounds between the binahong group and the red betel group with a p value of 0.0001 < (0.05).	This study shows that the processing of boiled red betel leaves is effective for the recovery of postpartum maternal perineal wounds. Thus, boiled red betel leaves are recommended as an alternative treatment for postpartum mothers who suffer from perineal wounds.
2	Author: Salmiani Abdul Manaf Journal: Science Midwifery Title: The effectiveness of using red betel leaf infusion compared to binahong leaf (anredera cordifolia) infusion in healing external genital infections	quasi-experimental study with randomization and pre-post test design	1b	This study employs a quasi-experimental method with a pre-post test design and randomization. The research subjects are divided into two groups: treatment group I, which undergoes washing with boiled red betel leaf (Piper Ornatum) infusion, and treatment group II, which undergoes washing with boiled binahong leaf (Anredera cordifolia) infusion. The	The results show a significant difference in the healing of external genital infections in female cockle seekers before and after the use of boiled water from red betel leaves, with p=0.000 (p<0.05), as well as a significant difference before and after the use of Binahong leaf decoction, with p=0.000 (p<0.05).	he findings indicate that boiled water from red betel leaves is more effective in healing external genital infections compared to Binahong leaf decoction among female cockle seekers in Krueng Tibang, with an average infection healing score of 25

Table 1 shows two articles were obtained from the journal search. The first journal is a study by Karimah, et al. (2019) who conducted a quasi-experimental study on 32 respondents who were divided into the binahong group and the red betel leaf group. The study was conducted to analyze the differences in the healing period of perineal wounds in postpartum mothers who were given boiled binahong leaves and boiled red betel leaves. Perineal wound healing was evaluated using the REEDA score from the 2nd day postpartum until the wound healed. The average healing period for perineal wounds in the binahong group was 6 days, while the red betel group was 4.69 days. There was a significant difference in the healing period for perineal wounds between the binahong group and the red betel group with a p value of 0.0001 < (0.05).[6]

The second journal used as a reference in the application of evidence based case report (EBCR) is the research of Manaf & Novemi, (2024) who conducted a study with a quasi-experimental design with a randomized pretest posttest design approach on 60 postpartum mothers who experienced perineal wounds. The sample was divided into 2 groups, namely treatment group 1 (given red betel leaf decoction) and treatment group 2 (given binahong leaf decoction). The washing process is carried out for 14 days with the assistance of trained enumerators. Evaluation is conducted every 5 days, and a repeat speculum examination is performed on the 15th day. The data obtained are analyzed using Wilcoxon signed-rank and Mann-Whitney statistical tests. The average healing score using red betel leaf decoction was 25, while using binahong leaf decoction was 36. Statistical test results show a significant difference between the two groups (p = 0.004, p <0.05).[7]

Based on the results of the study and suggestions from the 2 research journals, the author conducted an intervention by giving boiled betel leaves to Mrs. R P3A0 postpartum with a 2nd degree perineal suture wound which aims to evaluate the healing time of the perineal wound. The treatment given was to give boiled red betel leaves in the morning and evening for 7 days. The procedure for making boiled betel leaves is 25 grams of betel leaves added to 100 ml of water then boiled for 15 minutes and waited until the boiled betel leaves are cold.[8] The boiled betel leaves were then filtered and the boiled water was used to clean the vagina in the morning and evening. Perineal wounds were observed every morning to assess the recovery of perineal wounds from the first day postpartum until fully recovered using the REEDA score.

Table 2. REEDA Score (Hill, 1990).[9]

Points	Redness	Oedema	Ecchymosis	Discharge	Approximation
0	None	None	None	None	None
1	Within 0.25 cm of the incision bilaterally	Perineral, < 1 cm from incision	Within 0.25 cm bilaterally or 0.5 cm unilaterally	Serum	Skin separation 3 mm or less
2	Within 0.5 cm of the incision bilaterally	Perineal and or between 1-2 cm from the incision	Between 0.25-1 cm bilaterally or between 0.5-2 cm unilaterally	Serosanguinous	Skin and subcuntaneous fat separation
3	Beyond 0.5 cm of the incision bilaterally	Perineal and or vulvar > 2 cm from incision	> 1 cm bilaterally or > 2 cm unilaterally	Bloody, purulent	Skin, subcuntaneous fat and fascial layer separation

Table 2 shows the wound healing observation sheet instrument with REEDA score. REEDA score is a perineal wound healing assessment tool mainly developed by Davidson. This scale is used to monitor and assess the level of wound healing using a scoring system. REEDA score includes redness, edema, ecchymosis, discharge, and approximation with the highest score of each aspect is 3 and the lowest score is 0. A higher score indicates a higher degree of tissue trauma and the perineal wound is healed when the REEDA score is 0.[10] The value of the number of healing items is as follows:

0 = good wound healing / wound healing days
1-5 = poor wound healing
>5 = poor wound healing

RESULT AND DISCUSSION

The administration of betel leaf decoction was carried out to Mrs. R P3A0 on October 29, 2024-November 4, 2024 in the working area of the Rancaekek DTP health center. In its implementation, the betel leaf solution given to Mrs. R was made according to evidence in previous journals with a frequency of use in the morning and evening, and sometimes added when cleaning the vagina when changing pads. Mrs. R cleaned the vulva with boiled betel leaves for 5 days because on the 4th day she no longer felt any complaints in her stitches. This is in accordance with recommendations in previous studies that the time of administration of boiled betel leaf water (piper betle) is given for 5 consecutive days, used 4x a day as hygienic vulva douching water, then the length of time for healing perineal wounds after douching using boiled betel leaf water (piper betle) is evaluated, namely the longest time for 7 days, the slowest 4 days and with the fastest healing of perineal wounds 3 days.[11] In this study, the REEDA instrument was used to evaluate the healing of perineal wounds in Mrs. R from the first day until the perineal wound healed. The evaluation results are attached in table 2.

Table 2. Evaluation of perineal wound healing in Mrs. R

Day-	Redness	Oedema	Ecchymosis	Discharge	Approximation	Total
1	2	2	2	3	0	9
2	1	1	1	1	0	4
3	1	0	0	0	0	1
4	0	0	0	0	0	0
5	0	0	0	0	0	0

Table 2 shows the results of the evaluation of perineal wound healing in Mrs. R periodically for 5 days. The REEDA score on the first day obtained a total score of 9 with a redness score of 2 (there is redness less than 0.5 cm on both sides of the laceration) edema 2 (there is edema between 1-2 cm from the laceration), ecchymosis 2 (there is bruising/spots 0.25-1 cm from the laceration), discharge 3 (bleeding), and approximation 0 (closed wound). On the 2nd day the REEDA score decreased with a total score of 4, namely a redness score of 1 (there is redness less than 0.25 cm on both sides of the laceration) edema 1 (there is edema on the perineum <1cm from the laceration), ecchymosis 1 (there is bruising/spots <0.25 cm from the laceration), discharge 1 (serum), and approximation 0 (closed wound). On the 3rd day evaluation, a total score of 1 was obtained, there was 1 indicator with a score of 1, namely redness (there was redness less than 0.25 cm on both sides of the laceration). On the 4th day evaluation, a score of 0 was obtained, meaning that no indicator had a score and the perineal wound was declared healed. The criteria for a wound with a good assessment if the wound is dry, the perineum is closed, and there are no signs of infection such as redness, swelling, heat, or pain.
Based on the REEDA score, Mrs. R's perineal wound obtained a score of 0 on the 4th day, which means that the perineal wound was declared healed on that day. This is in accordance with the research of Putri R (2024) which stated that the healing time for perineal wounds in postpartum women who were given boiled betel leaves was within 4-5 days. This time is shorter than the healing time for perineal wounds in normal postpartum women in general, which is on average on the 7-10th day postpartum. This shows the effectiveness of boiled betel leaves (piper betle) in the process of accelerating the healing of perineal wounds in postpartum mothers.[11] Similar research was also conducted by Hastuty (2022) with the results that giving boiled red betel leaves to

postpartum mothers was faster than giving boiled binahong leaves, namely the healing time for perineal wounds using boiled red betel leaves was on average healed on days 4-5.[12]

The wound healing process is characterized by the process of breaking down or forming catabolic and anabolic. The healing time of perineal wounds lasts about 7-10 days and no more than 14 days.[13] In wound healing there are 4 stages, namely the hemostatic phase, inflammatory phase, proliferation phase, and maturation phase.[14] Proper and proper perineal wound care can prevent perineal wound infection. One of the potential medicinal plants is betel leaf. Betel leaf contains various active ingredients that are believed to help the wound healing process and function as antioxidants and antimicrobials so that they affect the wound healing process and accelerate epithelialization.[8]

Betel leaf or piper crocatum is a plant belonging to the Piperaceae family that has many active substances. Some of the identified active substances include phenol, flavonoids, tannins, polysaccharides, essential oil compounds (betlephenol, sesquiterpene, starch, diastase of 0.81%, sugar), clavicol, alkaloids, and saponins which are useful for wound healing, antifungal, and antioxidant. These properties are empirically able to kill candida albicans fungus and prevent infection so that they are useful for wound healing.[15] Several studies have reported that betel leaves provide anti-allergic and anti- inflammatory effects by inhibiting several pro-inflammatory cytokines.

The compounds in betel leaves that provide anti-inflammatory effects include catechaldehyde and tannin.[8] Catechaldehyde (also known as protocatechuic aldehyde) is an active component of betel leaves that provides anti-allergic and inflammatory effects. The anti-allergic inflammatory mechanism of Catechaldehyde has several biological activities such as neuroprotective effects, cardioprotective effects, and antioxidant stress effects.[16] Tannin compounds are similar to chemical compounds that have benefits for killing or inhibiting the growth of microorganisms on living tissue such as the surface of the skin, as well as anti-inflammatories or chemical compounds that are used to relieve inflammation. [17]

Betel leaves also have antibacterial properties. Phenolic compounds found in betel leaves act as antibacterial agents by inhibiting bacterial growth (bacteriostatic) and killing microbes (bactericidal). Investigations on the antibacterial activity of herbal extracts indicate that phenolic compounds are the most common metabolites with the ability to inhibit microbial growth.[18] A possible explanation for this is that the action is the activity of the carboxyl groups in aromatic hydrocarbons. These groups form complexes with extracellular and soluble proteins of the bacteria resulting in the loss of the ability of the bacteria to infect.[19] Apart from that, there is also chavicol 7.2-16.7% which functions as an antiseptic or substance that can inhibit the growth of germs.[17] Chavibetol and chavicol are compounds that have antiseptic properties closely related to inhibiting bacterial growth.[15] The flavonoid content in betel leaves will also bind to bacterial extracellular proteins through hydrogen bonds and covalent bonds to form a complex that will disrupt the function of bacterial cell walls, inactivate microbial adhesion, enzymes, cell transport proteins, and all four.[20] The mechanism of flavonoid also disrupting the potassium concentration of gram-positive bacteria which leads to the dysfunction of its cytoplasm membrane The inhibitory effect of tannin is due to tannic acid. The mechanism proposed was due to its ability to create a change in its potassium concentration, enzyme production inhibition, and enzymatic reactions inhibition [18]

In addition to the evaluation using the REEDA score, the author also explored the patient's experience when using boiled betel leaves to clean the vulva through interviews. Mrs. R said she felt comfortable when cleaning the vulva with betel leaves, the benefits felt were the absence of odor and stinging when used, and the healing of perineal stitches was faster than previous childbirth experiences, namely an average wound healing of 14 days. In line with Wulandari's research (2022) that the use of boiled betel for wound healing increased respondent satisfaction because the pain in the perineal stitches was quickly reduced.[17] In addition, the saponin content in red betel can stimulate the formation of

collagen, a structural protein that plays a role in the wound healing process.[15] This is what makes the healing of wounds in postpartum women who are given boiled betel leaves faster.

Mrs. R. said she felt comfortable with the aroma of the boiled betel leaf which made her perineum area not have an unpleasant odor and had a distinctive scent of betel leaves. The natural scent of betel leaves is caused by betel leaves containing a lot of essential oils. The essential oil content in betel leaves is 1-4.2% so that it gives a natural fragrant aroma to betel leaves and is effective in killing bacteria and fungi.[17] In addition, the essential oils contained in red betel leaves have properties as an anticonvulsant, antiseptic, analgesic, anti-dandruff, antidiabetic, hepatoprotective, antidiarrheal, immune booster, and anti-inflammatory.[21]

Treatment using betel leaves is widely chosen by most people because it is easy to obtain, cheap, easy to process, and is included in a series of herbal treatments that are very popular with the Indonesian people. The use of herbal plants, such as betel leaves, is also a natural treatment because the side effects can be minimized, unlike the use of chemical products. Thus, boiled betel leaves can be used for postpartum mothers with stitches as wound care.

CONCLUSION

The healing of the perineal wound in Mrs. R took place in 4 days. Thus, the administration of boiled betel leaves was effective in accelerating the healing of the stitched wound in Mrs. R. The use of boiled betel leaves can be used as an effective alternative for the treatment of perineal wounds.

COMPETING INTERESTS

All authors had none to declare

AUTHOR'S CONTRIBUTION

Dina Kurniasih conceived of the presented idea, data collection and analysis, and writing manuscript; Chris Sriyanti was in charge of presented idea and analysis; and drafting the manuscript. All authors contributed to the final manuscript.

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