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BETEL LEAF DECOCTION AS AN ANTISEPTIC FOR PERINEAL WOUND HEALING

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Perineal wound after delivery often causes infection. Perineal wound care can be done by washing the wound using an antiseptic solution. This study is aimed to compare the affectivity of betel leaf decoction for Perineal Wound Healing with the well-known antiseptic, 10% povidone iodine solution. We employed a quasy-experimental research design with non-randomized repeated measure with control group and post-test design. A total of thirty-four normal postpartum women with spontaneous delivery were recruited from a health centers in Banyuurip, Purworejo district, in December 2013 to February 2014, using a purposive sampling technique. The respondents were then distributed equally to control and experimental group. The normal postpartum women at the experimental group obtained betel leaf decoction for the wound recovery whilst the control group washed the wound with a 10%-povidone iodine solution. Either betel leaf decoction or a 10%-povidone iodine solution was given 20ml/day for washing the wound 2 times a day. By the result, we revealed the betel leaf decoction was effectively as 10% povidone iodine solution to heal the perineal wound regarding to the upper arm circumference (UAC), duration of perineal wound recovery, and Hg Level. As the conclusion we recommend betel leaf decoction as a natural antiseptic for perineal wound healing among the normal postpartum women

Keywords: Betel Leaf Decoction, Perineal Wound, Antiseptic

1. INTRODUCTION

Childbirth is the process of spending the products of conception (fetus and placenta) that has been quite a month or can live outside the womb through the birth canal or another way, with assist or not (Manuaba, 2010). Childbirth is a physiological process that often causes injury in the birth canal. Birth canal injury which not been treated properly may cause germ infection (Prawirohardjo, 2006). In Asia, perineal rupture is also a considerable problem in the society by 50% of perineal rupture incidence in the world. In Indonesia, the prevalence of mother who have a perineal rupture in the age grouprevalep 25-30 years is 24% and 32-39 years is 62% (Chapman, 2006). According Kemenkes RI (2010) 90% of maternal mortality occurred at delivery and immediately after delivery which is due to an infection in puerperium (reached to 2.7%) and acute infection (approximately at 0.7%) (Kemenkes RI, 2010).

Perineal laceration is the injury that occurs during labor at the perineal (Patree and Walsh, 2007). Observation and special care are required to ensure the perineal wound healing and prevent the infection. Perineal wound care can be done by washing wounds with an antiseptic solution.

According to (Suryadi, 2007) antiseptic is a substance that used to prevent the microorganism growth that may spread an infection.

Betel (*Piper betle* Linn.) leaves may be used as antiseptic since it contains essential oils (i.e., bethephenol, chavicol, sekulterpen, hidriksivaikal, cavibetol, estrogen, eugenol, and karvarool) which have natural potency to inhibit microorganism growth, and its antioxidant can accelerate the wound healing process with no side effects (Hidayat, 2013). Moreover, Salim (2006) found that that betel leaf decoction passed the toxicity tests. It suggests the betel leaf benefit may be used for wound healing with no significant side effect. Therefore, in this study, we try to find out the healing effectiveness of betel leaf for recovering the perineal wound among postpartum women and compare it to the healing process resulted by povidone iodine solutions which have been used in majority.

2. RESEARCH METHODOLOGY

2.1. Design and Samples

The population in this study included 34 normal postpartum women with spontaneous delivery from a health centers in Banyuurip, Purworejo district, in December 2013 to February 2014. This study employed a quasy-experimental research design with a randomized non-repeated design where the intervention and control group, each consisted of 17 respondents, were compared after intervention (Posttest Only Control Group Design).

A purposive sampling technique was developed in this study where respondents in the experimental group were given betel leaf decoction, and the control group was intervened by a 10% povidone iodine solution. The respondents were 34 normal postpartum women day one who corresponded with inclusion criteria. Inclusion criteria in this study were normal delivery, parity >1, postpartum day one, UAC >23 cm by mateline, degree perineal wound I and II, willing to used betel leaves for treatment of wound perineal in the intervention group, and willing to used 10% povidone iodine for treatment of wound perineal in the control group. The 10% povidone iodine was pure, not added by other liquid or NaCl.

Twenty five to thirty betel ripe leaves were boiled in 300 ml of water during the 10-15 minutes until the remaining 50 ml of water, to make betel leaf decoction. Based on the theory, the numbers of betel leaves was 10-15 pieces and boiled in 2000 ml of water. But the concentration of betel leaves boiled water was too aqueous. So the researchers used 25-30 pieces of betel leaves and boiled in 300ml. The researcher provided 150 ml of betel leaf decoction to respondents for 7 days. Either betel leaf decoction or a 10%-povidone iodine solution was given 20ml/day for washing the wound 2 times a day. There was no difference of temperature between betel leaf decoction and 10% povidone iodine. There wasn't any pressure when apllied to wash the wound and wound dressing with towel. The duration of perineal wound recovery is the time required for reunite the body tissues, and was observed by the researchers.

2.2. Measurement

The research instrument used in this study is a checklist structured observation with seven yes-and-no questions including redness, warmth, painful, swollen, pus, dry, and perineum was fused to assess the recovery perineal wound. Researcher describes how to prepare a decoction of betel leafs to the patient and their family.

Data collection was begun with preparing the instruments and permit submission. In implementation phase, researchers collected the data according to the procedure of intervention research for three days. In the first day, the researcher met the respondents who met the inclusion and

exclusion criteria then made contract with the respondents for implementing the perineal wound care. After the respondents agreed with the contract, the researcher provided perineal wound treatment. The intervention group received perineal care treatment with betel leaf decoction, while in the control group obtained a 10% povidone iodine solution. The researcher conducted home visit in the third and seventh day after the treatment for observation. Perineal wound care conducted by researchers to the respondent performed 2-4 times a day in the bath, after defecate and urination either using betel leaves decoction or 10% povidone iodine solution (Khumaira, 2012).

2.3. Data Analysis

In this research, characteristic respondents and the duration of perineal wound recovery were obtained by univariate test. Mann-Whitney test was employed to obtain the significance level of recovery duration between the two independent groups

3. RESULTS AND DISCUSSIONS

3.1. Respondent characteristics

Respondent characteristics are shown in Table 1. We involved 34 normal postpartum women with vary parity in this study. The majority were 26-30 years old. The respondents were divided by three age groups by 5 year age interval. The majority of respondent was postpartum woman on the 26-30 aged groups at the second parity. Among the respondents, only one woman reported had delivered four children.

Table 1. Characteristics of age and parity participants (n=34)

Characteristics	Betel leaf decoction		10% povidone iodine solution	
	N	(%)	N	(%)
Age				
< 26 years	4	23,5	6	35,3
26-30 years	8	47,1	8	47,1
31-35 years	5	29,4	3	17,6
Parity (times)				
2	9	52,9	15	88,2
3	7	41,2	2	11,8
4	1	5,9	0	0

As shown in Table 2, the shorter upper arm circumference (UAC) was revealed at the group obtained 10% povidone iodine solution (Mean ± SD, 25.3 ± 1.7 cm) at the range from 23 to 29 cm. However the difference was found not significant if compare to the result at the group who obtained betel leaf decoction. We observed the UAC at the respondents applied betel leaf decoction was 25.5 ± 1.8 cm, at the range of 23 cm to 30 cm. This research was supported by the theory that the wound healing process is affected by the vascularity, anemia, age, nutrition, other diseases, obesity, drugs, smoking, and stress.

Table 2. The affectivity of Betel Leaf Decoction for Perineal Wound Healing

Parameters	Treatment		*p value*
	betel leaf decoction (N=17)	10% povidone iodine solution (N=17)	
Upper arm circumference (UAC) (cm)			
Range	23-30	23-29	0.806
Mean ± SD	25.5 ± 1.8	25.3 ± 1.7	
Duration of perineal wound recovery (day)			
Range	3-7	3-7	0.094
Mean ± SD	4.7 ± 1.3	5.5 ± 1.5	
Hg Level (gr/dL)			
Range	11-12.2	11-12	0.170
Mean ± SD	11.5 ± 0.3	11.3 ± 0.4	

We highlighted that either applied by betel leaf decoction or 10% povidone iodine solution the perineal wound recovery needs 3 to 7 days. Prawiroharjo (2006) suggested that basically the birth canal injury or perineal wound 6-7 days will recover sovereign, when there is no infection. It indicated that the treatment may reduce the duration reached to 3 days among the respondents. The data shows the shorter duration among postpartum women who washed the wound with betel leaf decoction. On the average (± SD) betel leaf decoction will heal the perineal wound in 4.7 ± 1.3 days, and on other hand, the recovery using 10% povidone iodine solution needs almost one day longer.

The Hg level was also observed in this study. Anemic conditions will slow down the process of wound healing because of the repair cells need adequate protein levels. Therefore, people with short of Hg levels, the wound healing is longer than people with high of Hg levels. The factors that affect wound healing include anemia, vascularization, nutrition, age and other illnesses. Between the two different treatments, the significant difference of Hg level was not found. The mean Hg level observed among the respondents who obtained betel leaf decoction 11.5 ± 0,3 gr/dL at the range of 11 to 12,2 gr/dL. While, among the normal postpartum women involved at the group who obtained 10% povidone iodine solution, the Hg level was found on the average of 11,3 gr/dL (± 0,4 gr/dL) at the range of 11 to 12 gr/dL.

Based on the analysis used the Mann-Whitney Test obtained that $p > 0.05$, there was no difference betel leaf decoction and 10% povidine iodine for perineal wound healing. Betel leaf (Piper betle L.) in general have been known to the public as traditional medicine. As with antibiotics, betel leaf also has antibacterial power. These capabilities because of the various substances contained in betel leaf. Betel leaf contain 4.2% essential oils are largely composed of chavicol paraallyphenol derivatives of Chavica betel. Isomer Euganol allypyrocatechine, cineol methyl euganol and Caryophyllen, kavikol, kavibekol, estragol, terpinen. These results are consistent with the results of laboratory tests conducted by researchers at the Faculty of Biology Gadjah Mada University who found that betel leaf decoction contain essential oils, saponins, flavonoids, phenolic, alkaloid, piperine, tannins and eugenol.

Karvakol in betel leaves act as a disinfectant and antifungal so that it can be used as an antiseptic, and methyl-euganol can euganol used to relieve toothache. Saponins and tannins are as antiseptic on the wound surface, which normally works as bacteriostatic used for infections of the skin, mucosa and fight the infection in the wound. Flavonoids in addition to functioning as a bacteriostatic also serves as an anti inflammatory. Kartasapoetra (1992) in Hermawan (2007) states

leaf betel among others contains kavikol and kavibetol which is a derivative of phenols which have antibacterial activity five times that of ordinary phenol against Staphylococcus aureus.

The workings of phenolic in killing microorganisms is by how to denature the protein cells. With denaturation cell protein, then all the metabolic activity of cells is catalyzed by an enzyme that is a protein. Differences in the diameter of inhibition shown on the betel leaf bacteria S. aureus and E. coli because of differences in the structure of cell walls of bacterium.

Diameter inhibition betel leaf extract on S. aureus wider instead of E. coli as the S. aureus cell wall consists of several layers peptidoglycan in the absence of three polymer wrapping which is located outside the peptidoglycan layer is lipoprotein, outer membrane and lipopolysaccharide such as that possessed by E. coli because it has a layer S.aureus peptidoglycan the cell will be easily denatured by the phenol bethel contained in a betel leaf extract so that the diameter of inhibitory power over wide.

Based on the description, proved that betel leaf has strong to used as a medicine because it contains essential oils with components of natural phenols that can affect growth S. aureus and E. coli bacteria.

The results of laboratory tests conducted by researchers at the Faculty of Biology of the betel leaf decoction obtained compounds that act as antibiotics, namely phenolic compounds and compounds essential oils. Betel leaf contain oil volatile, which is a time characteristic odor, volatile at room temperature without undergoing decomposition.

Based on these characteristics, the betel leaf can be entered as ideal antiseptic, according to the laboratory experiments that have been conducted and the results of research conducted on the healing process perineal wound on postpartum women. This research used betel leaf is to provide concrete examples of the communities that wound healing can be done without the patented drugs. Besides easy get a betel leaf, not expensive in the community is a factor considered by researchers.

4. CONCLUSIONS AND RECOMMENDATIONS

By the result, we revealed the betel leaf decoction was effectively as 10% povidone iodine solution to heal the perineal wound regarding to the upper arm circumference (UAC), duration of perineal wound recovery, and Hg Level. As the conclusion we recommend betel leaf decoction as a natural antiseptic for perineal wound healing among the normal postpartum women and need research about dose of betel leaf decoction by using laboratory tests.

REFERENCE

1. Chapman, V. (2006). Asuhan Kebidanan Persalinan & Kelahiran (The Midwife's Labour And Birth Handbook). Jakarta : EGC, 31
2. Hermawan, A. (2007). Pengaruh Ekstrak Daun Sirih (Piper betle L.) Terhadap Pertumbuhan Staphylococcus Aureusdan Escherichia Coli Dengan Metode Difusi Disk *(Effect of Betel Leaf extract (Piper betle L.) on Growth of Staphylococcus Aureus and Escherichia Coli With Disk Diffusion Method)*
3. Hidayat, A.A.A. (2006). Pengantar Kebutuhan Dasar Manusia: Aplikasi Konsep dan Proses Keperawatan *(Introduction to Basic Human Needs : Concepts and Application of Nursing Process)*. Jakarta. Salemba Medika. Hal. 123-124
4. Hidayat, T. (2013). Sirih Merah *(Red Betel)*. Yogyakarta : Pustaka Baru Press, 4, 7-9, 38-41
5. Kemenkes, RI. (2010). Pedoman Pemantauan Wilayah Setempat KIA (PWS-KIA) (Local Regional Monitoring Guidelines of Health oh Maternal Perinatal) . Jakarta : Direktorat Jenderal Bina Kesehatan Masyarakat, Direktorat Bina Kesehatan Ibu, 21
6. Khumaira, M. (2012). *Ilmu Kebidanan (Midwifery Science)*. Yogyakarta : Citra Pustaka, 115-116

7. Manuaba, IAC., Manuaba, IAGF & Manuaba, IBG. (20100. Ilmu Kebidanan, Penyakit Kandungan Dan KB Untuk Pendidikan Bidan (Midwifery Science, Obstretic Disease and Contraception For Midwife Education). Jakarta : EGC, 136-137
8. Oxorn. Ilmu Kebidanan Patologi Persalinan *(Maternity Obstetrics Pathology)*. Yogyakarta : Yayasan esensial Medika. Hal. 256-266. 2010
9. Patree, B dan Walsh, VL. (2007). Buku Ajar Kebidanan Komunitas (Midwifery Community Handbook). Jakarta : EGC, 50
10. Potter, P.A, Perry, A.G. (2005). Buku Ajar Fundamental Keperawatan : Konsep, Proses, dan Praktik.Edisi 4.Volume 2 *(Fundamental of Nursing Handbook : Concepts, Proces, and Practice. Ed 4. Vol. 2)*. Alih Bahasa : Renata Komalasari, dkk. Jakarta: EGC
11. Prawirohardjo, Sarwono. (2006). *Ilmu Kebidanan (Midwifery Science)*. Jakarta : Yayasan Bina Pustaka, 180, 242-243, 689-690
12. Rejeki & Ernawati. Faktor-Faktor Yang Berpengaruh Pada Penyembuhan Luka Perineum Ibu Pasca Persalinan Di Puskesmas Brangsong Dan Kaliwungu Kabupaten Kendal, Universitas Muhamadiyah Semarang *(The Factors Related to Perineal Wound Healing On postpartum Women At Brangsong and Kaliwungu Public Health Center Kendal District)*. 2010
13. Salim, A. (2006). Potensi Rebusan Daun Sirih Merah (Piper Crocatum) Sebagai Senyawa Antihiperglikemia Pada Tikus Putih Galur Sprague-Dawley (Red Betel Leaf Decoction Potential As Antihyperglicemic In Galur-Dawley Rats). Institut Pertanian Bogor
14. Suryadi. (2007). *Manajemen Luka (Wound Management)*. Pontianak : Romeo Grafika Pontianak, 13-14, 34, 93-98