ORIGINAL ARTICLE

THE EFFECT OF CASUMBA TURATE (Carthamus Tinctorius L) ON PERINEAL WOUND HEALING OF GALIST WISTAR

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ABSTRACT

Perineal injury is one of the most common causes of first birth and results in perineal tears, which categorized into four degrees, including stage I, stage II, stage 3 III, and stage 4 IV. The study aimed to examine the effect of the casumba turate extract ointment (Carthamus tinctorius L) on improving the perineal wound healing among Wistar (Rattus norvegicus). An experimental laboratory test with a randomized control trial in the post-test only with control group design was applied in this study. Thirty-two samples comprised of experimental group (n=16) and control group (n=16) were involved in this study. REEDA scores using the Mann Whitney test analysis were used to determine the progress of perineal wound healing. The results showed that there is a significant difference in mean score between intervention and control group after implementation of the casumba turate ($p < 0.05$). In conclusion, casumba turate extract 5% ointment has a positive impact on the wound healing process for perineal of Wistar (Rattus norvegicus).

Keywords: casumba turate, perineal wounds, Wistar

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INTRODUCTION

Prevalence of perineal injury among mothers is rising in the last decades. World Health Organization (2009) estimated that 2.7 million cases of perineal injury in maternal mothers (1). In Indonesia, 85% of mothers with vaginal birth experienced have 32-33% perineal trauma from an episiotomy, whereas 52% from spontaneous rupture. From that number, 2.7% of patients developed to be infection puerperium, and 0.7% extends to infection (2). Although the incidence of puerperium infection is not quite high, it may impact recovery duration in the puerperium period (3,4).

Caring for the wound on perineal commonly used betadine or betadine gauze; however, it has not been proved to decrease the length of time in perineum wound healing (5,6). The intervention of perineal wound treatment currently still used antibiotics due to bacterial resistance occurrence when misuse of taking medicine. Whereas, antibiotic was associated with the wound healing process following the expected time. Previous studies applied a natural of casumba turate (Carthamus tinctorius.L) showed wound healing was quick. This finding proved that the casumba turate plant might be as a therapy to prevent

infections (7,8). Another study showed that local wisdom natural ingredients such as black cumin ointment, betel leaf extract gel, and Binahong leaf decoction were useful in the wound healing process.

This Tinctorius L consisted of flavonoids, saponins, terpenoids, phenylethanoid glycosides, coumarins, fatty acids, and steroids (8,9). The extraction of Carthamus tinctorius L has a positive effect on managing cardiomyopathy, gynecological diseases, menstrual problems, and anti-tumor agent. Casumba turate contains flavonoids that can increase absorption and use of vitamin C in the body, as an antibiotic, and anti-inflammatory, which has a positive effect on wound healing (10).

A literature review study mentioned that casumba turate has flavonoid content, which effects as an anti-inflammatory. It has the benefit of the response of tissue damage, an infection caused by pathogenic microbes, and irritation due to chemicals. The inflammation process started from the migration of immune cells from blood vessels and releases mediators to the site of damage (11). The pharmacological activities of flavonoids that occur are anti-inflammatory, analgesic, anti-oxidation. Also, anti-inflammatory mechanisms will occur through an effect of inhibition that appears on the arachidonic acid metabolism pathway, prostaglandin formation, release of inflammatory histamine (12).

Although the previous study confirmed the positive effect of casumba turate on the general wound, however, Not study examined the impact of casumba turate (Carthamus tintorius.l) on the speed of wound healing for perineal. Whereas common injuries and perineal wounds differ in types of scars, the location, causes, and anatomical structure of the perineal muscle itself are different from other muscle anatomical structures. Therefore, the researcher focused on this casumba turate on the speed of wound healing for perineal among rats Wistar strain. The progress of wound healing was monitored by using REEDA score measurements (redness, edema, ecchymosis, discharge, and approximation).

OBJECTIVES

The study aimed to examine the effect of casumba turate ointment on the wound healing process of rats Wistar (Rattus norvegicus) based on REEDA scores.

METHODS

Research design

An experimental randomized control trial, post-test only with the control group, was applied in this study. This study compared the mean differences of wound healing duration of the Wistar strain (Rattus norvegicus). The study divided into an experimental group that received the Casumba turate ointment, while the control group received dry treatment.

Setting, samples, sampling technique

Subjects in this study were 2 to 3 months aged of Wistar strain rats (Rattus norvegicus). Samples were selected by using simple random sampling. Thirty samples were allocated in the experimental group, and 30 samples were the control group. The inclusion criteria of study including 1) adult aged and healthy Wistar (Rattus norvegicus) as well as no anatomical abnormalities; 2) female age and weights between 170 and 200 grams. The exclusion criteria of samples as follows; 1) Wistar strain rats (Rattus norvegicus) got sick during the process were excluded in this study; 2) 10% of weight loss during the research process; 3) developed an infection on wound.

Instruments

We used the observation sheet and REEDA scores to observe the progress of wound healing. The instrument used a total of 30 pieces of bisturi used to make incision wounds in the perineum of female rats. Disposable ruler with a length of 1 cm.

Ethical consideration

This research had been approved by the Animal Laboratory Faculty of Medicine, Diponegoro University, Semarang, and had permission from the RSUD Dr. Moewardi Solo.

Data analysis

Univariate analysis was performed on each study variable, using tests of normality, frequency, mean (x) standard deviation (SD), minimum, and maximum. Data were presented descriptively in tabular or graphical form and narrated. Variables analyzed using univariate analysis are subjective characteristics consisting of age, weight, and duration of wound healing. Data normality test uses the Shapiro Wilk test; the type of experiment was chosen because the number of samples in the study was small (<50) with a significance value> 0.05; otherwise, the data were normally distributed. The normality test was conducted on both two groups (p-value <0.05). The bivariate analysis conducted was a non-parametric test using the Man Whitney test to see differences between groups and the Friedman test and the post hoc Wilcoxon to see differences between measurements in each - each group.

RESULTS

Comparison of age and weight between the experimental and control group

Table 1 described a comparison of age and weight of samples. The average age was 2-3 months. Comparison of weight showed that samples in the experimental group were 190.20 (SD=7.408) grams, while in control group was 185,53 (SD=7.549)

Table 1 Age and weight characteristic

Characteristics of Respondent		Group						*P*
		Intervention			*Control*			
		Mean±SD	*Min*	*Max*	*Mean±SD*	*Min*	*Max*	
Age	*2-3 month*	*2,40±0,507*	*2*	*3*	*2,40±0,507*	*2*	*3*	*1,000*
Weight	*170 - 200*	*190,20±7,408*	*178*	*200*	*185,53±7,549*	*178*	*200*	*0,455*

Notes Mann Whitney

Comparison of REEDA score between the experimental and control group

Table 4.2 showed the correlation of REEDA (Redness, Edema, Ecchymosis, Discharge, Approximation) score between the experimental and control group. The REEDA scores of the experimental group in day-2, day-4, and day-6 showed significant different than the control group.

Table 2

Data Normality

Variable	Group					
	Intervention		*p*	Control		*p*
	Mean	SD		Mean	SD	
REEDA Score Day-2	10,93	0,549	0,001	13,27	0,799	0,002
REEDA Score Day-4	2,40	0,000	0,000	10,00	1,732	0,000
REEDA Score Day-6	2,40	0,000	0,000	7,47	3,067	0,000

Comparison of wound healing based on REEDA scores between the experimental and control group

Table 3 showed the comparison of wound healing based on REEDA scores between the experimental and control group. The results showed there are significantly different between on mean of wound healing between experimental and control groups in the second day, fourth day as well as the sixth day for each study group with p-value <.001.

Table 3

Total REEDA Score

REEDA Score	Group				
	Intervention		Control		*p*
	Mean ±	SD	Mean ±	SD	
Day-2	10,93	0,549	14,20	0,941	
Day-4	2,40	0,000	11,27	2,187	0,001
Day-6	0,00	0,000	9,33	3,848	

Comparison of duration of perineum wound healing on using EKT 5% and dry clean strategy

Table 4 showed a comparison of length of perineum wound healing on using EKT 5% and pure dry strategy. The results confirmed that the mean of wound healing time of Rats who used EKT 5% was 4.47 (0.516), whereas the control group was 6.87 (SD=0.352). In conclusion, there was significantly different from the duration of perineum wound healing on using EKT 5% and dry clean strategy (p-value=.001).

Table 6

The length of time healing perineum wounds to achieve REEDA Score = 0 In Rats (Rattus Norvegicus) wistar strain

Variable	Group				
	EKT 5%		Dry clean		
	Mean ±	SD	Mean ±	SD	p
Reeda score = 0	4,47	0,516	6,87	0,352	0,001

DISCUSSION

We evaluated the wound healing process by using REEDA included redness, edema, ecchymosis, discharge, and approximation. For t wound healing in time variables, all variables were a significant difference from the second day to the seventh day (p <0.05), but the difference in the fastest measurement time occurred in the intervention group ointment by achieving a minimum score (p <0.05) on the fourth day. This means that in the EKT 5% ointment group shows a stable value every day, the content of substances contained in the ointment is flavonoids that work to limit inflammatory cells so that the inflammatory reaction is shorter, saponins stimulate fibroblast in increasing collagen formation, resulting in tissue proliferation. Take place quickly, and terpenoids inhibit the growth of bacteria that can prevent infection that can hinder wound healing time.

At the time of injury, the body responds through several phases in the form of cellular and vascular responses that occur due to tissue damage. The inflammatory period starts with the aim of stopping the bleeding, cleaning the wound area from foreign bodies and dead cells, and preparing for the healing process to begin. On the second day, there was a difference in the total REEDA score in the intervention group (p <0.05). This was because the average for each group experienced a decrease in scores where the REEDA score on the second day for the group was (p <0.05) for the dry clean control group. This proves that the group faster decreased the total REEDA score compared to the dry clean control group, although it was not yet significantly different (p>0.05). Still, the intervention group experienced a decrease in total REEDA score caused by substances active flavonoid contained in the ointment, which acts as an anti-inflammatory, which can prevent infection and reduce inflammation in the wound.

On the fourth day, all groups had a significant difference based on the total REEDA score on the sixth day. The wound was not apparent in the group given the Casumba Turate Extract ointment. Based on statistical tests show that there is a difference between the intervention group and the control group on the duration of wound healing based on the REEDA score.

The mechanism of wound protection against wounds is reduced because fat is reduced in old age where the elasticity of the skin and connective tissue is stronger, which causes the surface to be more resistant to the factors causing the wound more quickly. The pressure that occurs in the peripheral tissue causes a static vein, which worsens the injury (13).

Chronic wound healing is a disruption of the standard structure and function of the skin associated with protracted wound healing. Due to chronic injury that affects the integument (8). The function of tissue union in unproductive skin has decreased. This study used adult mice that are ready and mature in terms of reproductive organs so that rats with adult age influence in the process of inflammation become faster, which affects the angiogenesis and vascularization so that the wound healing process takes place more quickly so that it is said to heal. Wound healing occurs more rapidly in old age than aging because the function of tissue pooling in the unproductive period has decreased (14)

Quality wound care affects wound healing, which aims to reduce pain and infection in wound sutures (15). The most dominant factor in wound healing is the treatment of perineum, where perineal care is the fulfillment of the need to nourish the injured area until the reproductive organs return to pre-pregnancy where perineal care is critical because the scarred stitches can become a bacterial medium that causes infection (16).

CONCLUSION

This study was an animal experiment to confirm the effect of casumba turate ointment (Carthamus tintorius l) on the perineal wound healing process among rats in the Wistar strain (Rattus norvegicus) based on REEDA scores. The results showed that there is a positive effect of the casumba turate ointment healing process on the second day, fourth day, and sixth day.

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