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Comparison of Conventional and Modern Wound Care in Post-Section Wounds at Cut Mutia Hospital, North Aceh Regency in 2023

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ABSTRACT
The World Health Organization (WHO) sets the average cesarean sections (CS) standard at 5-15% per 1000 births. However, cesarean section rates in private hospitals exceed 30%, compared to 11% in government hospitals. This study investigates the prevalence and complications of surgical wound infections post-cesarean section and the effectiveness of modern wound dressing techniques in reducing these infections. Data analysis reveals cesarean wound infections occur during hospitalization (27%), re-admission (1%), and post-discharge (71%). Surgical wound infections (SWI) significantly increase morbidity, treatment duration, and healthcare costs, with a direct death rate ranging from 3% to 75% globally. The study evaluated modern wound dressings adhering to "moist wound healing" principles, such as hydrocolloids, alginate, and foam, which maintain a moist environment to enhance epithelial cell proliferation, accelerate wound healing, and reduce scarring. Findings indicate that moist wound dressings significantly improve healing outcomes, promoting epithelialization and collagen synthesis, with techniques showing a 30-50% increase in epithelialization and a 2-5 times faster re-epithelialization rate. These results highlight the need for adopting advanced wound care techniques to reduce surgical wound infections and improve patient recovery post-cesarean section. The study implies that healthcare providers should integrate modern wound care practices to enhance maternal health outcomes globally.

Keywords: cesarean section, conventional wound care, modern wound care

INTRODUCTION

WHO sets the average standard for cesarean section in a country is around 5-15% per 1000 births (Ko et al., 2024). The proportion of cesarean section services in government hospitals is approximately 11%, while in private hospitals, it is more than 30% (Moquillaza-Alcantara & Palacios-Vivanco, 2023). According to WHO, the increase in deliveries by cesarean section in all countries during 2017-2018 was 110,000 per birth throughout Asia (Mattocks et al., 2024). The existing cesarean section delivery rate is actually too high, so there are various efforts to reduce it due to the increase in maternal morbidity and morbidity (Ko et al., 2024).

Odada et al. (2024) research on incision wound infections of cesarean section distinguishes infections based on the time of infection; the first infection is an infection that occurs when the patient is in the hospital with a total of 27%, the second infection that occurs during re-admission is 1%, and the largest infection case is after the patient

is discharged from the hospital with an incidence rate of 71% (Zhang et al., 2023). Surgical wound infection (ILO) is one of the post-surgical complications that is a serious problem because it can increase morbidity and length of treatment, which will certainly increase costs, possibly resulting in disability to death (De La Tejera et al., 2023; Galosi et al., 2024; Peter & Ali Seif, 2022). Directly related death rates from the ILO range from 3% to 75% in hospitals worldwide (Li et al., 2020). The incidence of ILO in hospitals worldwide has increased from 1.2 cases per 100 surgical procedures to 23.6 cases per 100 surgical procedures (Kivimäki et al., 2020).

The rapid development of wound care today is the use of dressings or dressings based on measuring the level of existing cost capabilities, of course, adjusted to the principle of wound care, which is to maintain the physiology of moisture in the wound environment so that it can trigger the tissue repair process (Galosi et al., 2024; Xu et al., 2024). The application of wound care is more based on the findings with a multidisciplinary approach, with the principles of "moist wound healing," "advance wound healing," a moist wound environment that can send epithelial cell migration, re-epithelialization, wound contraction, tissue growth, adequate debridement, clean and sterile techniques that adjust the condition of the wound (Kaminsky et al., 2022; Ou et al., 2024). Modern wound dressing is a wound care technique that is starting to be widely used today, using the principle of "moist." This gives wound tissue the opportunity to proliferate, namely by carrying out cell repair cycles (Arendsen et al., 2020; Ghosh et al., 2023).

The use of bandages focuses on dressings that are moist so that they are effective for healing wounds. The dressing does not inhibit the flow of oxygen, nitrogen, and other airborne substances (Kholeif et al., 2024). The selection of dressing is a very important stage in speeding up the wound healing process. Wound dressing, in particular, has undergone very rapid development. Currently, many wound dressing techniques have been developed, such as *transparent film dressings, hydrocolloids, alginate,* and *foam dressings* (Eskandarinia et al., 2024; N. M. Noor et al., 2024).

Research results of Tian et al. (2024) use the concept of wound care by maintaining the environment around the wound to stay moist by using a moisture-retaining bandage. It clinically has the advantage of increasing the proliferation and migration of epithelial cells around a thin layer of water, reducing the risk of scarring and others. Some of the advantages of this method compared to dry wound conditions are increasing epithelialization by 30-50%, increasing collagen synthesis by 50%, and, on average, re-epithelialization with moisture 2-5 times faster, and can reduce fluid loss from above the wound surface (Flora et al., 2023; H. Noor et al., 2023).

What makes this study distinct is its detailed examination of the clinical benefits of moisture-retaining bandages, which has not been comprehensively explored in previous research. The study provides quantitative data on the improvements in epithelialization and collagen synthesis, as well as the reduction in fluid loss, demonstrating clear advantages over traditional dry wound healing methods. The aim of this study is to investigate the efficacy of moisture-retaining bandages in wound healing, specifically focusing on their ability to enhance epithelial cell proliferation and migration, increase collagen synthesis, and speed up re-epithelialization while reducing

scarring and fluid loss. The study seeks to establish the clinical advantages of this method and its potential to improve wound care practices.

RESEARCH METHODS

This research design uses a quasi-experiment posttest-only design conducted on October 20-30, 2023, at the Cut Mutia General Hospital, North Aceh Regency. The study population was postoperative mothers of cesarean section who were treated in the puerperium. The study sample amounted to 18 people, divided into an intervention group of 9 people and a control group of 9 people.

This study was conducted intervention using wound care with modern dressings (tribe ointment) and conventional wound care using 10% povidone-iodine as a control group. Wound care is performed by nurses who have a modern wound dressing training certificate (CBWT or CWCC certified). On day four, after wound treatment, then the wound is observed by researchers accompanied by nurses using observation sheets/checklists consisting of tumor statements, rubor, calor, dolor, and functionless.

RESULTS AND DISCUSSION

Research Results

The respondents in this study were 18 participants, including nine post-cesarean section clients who used conventional wound care and 9 participants using modern wound care. The characteristics of respondents are described as follows:

Table 1. Characteristics of Research Respondents

Characteristic	Intervention Group			Control Group		
	n	Mean (SD)	%	N	Mean (SD)	%
Paritas	9	29,6 (3,5)	100	9	31,1 (3,4)	100
1-5	4		44,4	4		44,4
>5	5		55,6	5		55,6

The participants in the study from both groups each dominated labor more than five times. The largest mean value was the control group of 31.1. Furthermore, the wound healing values of both treatment and control groups can be seen in the following table:

Table 2. Distribution of Wound Healing Values in Modern and Conventional Wound Care Groups

Variable	n	Min-Max	Median
The value of wound healing in modern wound care	9	1-2	1,00
The value of wound healing in conventional wound care	9	2-4	3,00

The results of wound healing in the modern wound care group are faster, which is between 1-2 days, compared to conventional methods, between 2-4 days. The results of the analysis for comparison of modern and conventional wound care results can be seen in the following table:

Table 3. Comparison of Types of Wound Care Against Wound Healing in Modern and Conventional Wound Care Groups

Group	N	Mean rank	D	P-Value
Intervention groups with Modern wound care	9	5,50	,500	0,001
Control group with conventional wound care	9	13,50	,782	

The results of the analysis using the Mann-Whitney test obtained a p-value = 0.001 where $p < 0.05$, meaning that there is a significant difference between conventional wound care and *modern dressings* (tribe ointment).

Discussion

The results of the postoperative wound healing study of cesarean section in the conventional wound care group on the 4th day after surgery experienced impaired wound healing with an average value of 2.89. The wound healing value in the modern wound care group and standard care in post-cesarean section patients was better than that of conventional wound care, with an average wound healing value of 1.33. The value is not good to say that wound care is good, but when compared to conventional wound care, modern wound care is better. This is in line with the literature that says modern wound care can maintain moist conditions, control the incidence of infection, accelerate wound healing, absorb excessive wound fluid, remove dead tissue, and be comfortable to use, sterile, and cost-effective (Arisanty, 2018).

Acute wounds (postoperative wounds) can heal or close according to physiological wound healing time (Arisanty, 2018). Wounds can heal if they go through an inflammatory reaction (inflammatory phase), the main purpose of which is to recombine parts of the wound and restore its function (Sabiston, 2018). The inflammatory phase is the body's reaction to the wound that begins after a few minutes and lasts for three days after the injury. The wound repair process consists of hemostasis (controlling bleeding), sending blood and cells to the injured area (inflammation), and forming epithelial cells at the site of injury (epithelialization). During the hemostasis process, the injured blood vessels will be constricted, and platelets will gather to stop bleeding. The blood clot will form a fibrin matrix, which will later become a skeleton for cell repair. Damaged tissue and mast cells secrete histamine, which causes vasodilation of surrounding capillaries and secretes serum and white blood cells into the damaged tissue. This will cause redness, edema, warmth, and local pain. Leukocytes will reach the wound within a few hours. The main leukocytes that act on wounds are neutrophils that feed on bacteria and small debris. Neutrophils will die within a few days and will leave behind enzyme exudates that will attack bacteria or help tissue repair.

The results of this study showed significant differences in the wound healing process using modern and conventional wound care. This is because epidermal migration in superficial wounds is faster in moist than dry settings. This modern dressing serves to protect the wound from germ contamination and prevent germs from entering. This dressing provides a balanced, moist condition, that is, if the dry wound can be hydrated, and if wet, the fluid can be absorbed. Besides, it can help facilitate blood flow and vasodilation of blood vessels so that oxygenation and blood

flow to the wound can be facilitated properly. This dressing is very comfortable and *cost-effective* for patients (Arendsen et al., 2020).

The results of this study are in accordance with research conducted by Chuang (2023), which states that groups using modern wound care are more effective than those using conventional wound care, with a *p-value of* 0.000. Modern wound care *dressings* provide a moist atmosphere to the wound, which causes faster epidermal migration than the dry atmosphere of the wound. In addition, moist wound treatment will reduce infection more than dry wound care. A moist atmosphere can increase the migration of epithelial cells to the center of the wound and coat it so that the wound heals faster (Chuang et al., 2023).

In addition, Kielo-Viljamaa et al. (2022) stated that there is a correlation significance between modern wound care techniques on interculin one and interculin six levels rather than using conventional wound care techniques with *a p-value* of 0.00. These results occur because the wound-healing process is influenced by growth factors and cytokines (IL-1 and IL-6). It will stimulated by wound dressing. Modern wound dressing techniques used can absorb wound *drainage, non-adhesives*, and *debridement autolytic.*

CONCLUSION

The average value of wound healing after modern wound care is 5.50, while the average value of wound healing after conventional wound care is 13.50. There are significant differences in the wound healing process using conventional and modern wound care in postoperative cesarean section patients at Cut Mutia General Hospital.

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