



Original Article

## The effectiveness of aloe vera gel in reducing the pain of perineal wound

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### ABSTRACT

**Background:** Researches on applying ice gel and aloe vera gel compress to reduce perineal wound pain scale after childbirth has been widely studied and proven effective. However, the effectiveness of using both has not been studied.

**Objective:** The purpose of this study was to determine the effectiveness differences of ice gel and aloe vera gel in reducing the intensity of perineal wound pain.

**Methods:** It applied a quasi-experimental research design. The population was 116 post-partum mothers, a sample of 56 mothers with sutured perineal wounds grade II, divided into two groups of intervention (aloe vera gel compress) and control (ice gel compress), with a consecutive sampling technique. The pain before and after the intervention was observed and analyzed using the Wilcoxon and Maan Whitney tests.

**Result:** The mean reduction in pain scale in the group with the aloe vera gel treatment was more than that in another group with ice gel treatment, with a mean difference of 2.46 and 1.61. The statistical analysis results showed a significant difference in pain relief between the two groups,  $p < 0.05$ .

**Conclusion:** The aloe vera gel compresses are more effective than the ice gel compresses in reducing the scale of perineal pain after childbirth.

### INTRODUCTION

Management methods aimed at reducing perineal wound pain for post-partum mothers are generally divided into pharmacological<sup>1</sup> and non-pharmacological therapy<sup>2</sup>. The former has an instant and immediate effect, but it brings some adverse consequences for the mother and her baby; it may cause allergic symptoms and can accumulate in the content of breast milk<sup>3</sup>. The principle of non-pharmacological management can use hypnotherapy, acupuncture, Transdermal Electrical Nerve Stimulation (TENS)<sup>4</sup>, and others. However, these techniques have many obstacles in their implementation; some must be done by particular experts and cost a lot. Thus, It needs non-pharmacological therapies that are cheap, safe, and effective in pain management. Such non-pharmacological treatments include ice gel<sup>5</sup> and aloe vera gel<sup>6</sup> compresses.

An ice gel compress is one of the methods in managing perineal pain<sup>7</sup>. Its working mechanism is that ice gel's cold nature makes blood vessels vasoconstriction in the wound

area and its surroundings to decrease the blood flow to the wound area. As a result, the edema in them becomes minimal. It also inhibits the inflammatory process so that the sensation of pain in the perineal area can be reduced<sup>8</sup>. Meanwhile, the aloe vera gel compress is the aloe vera plant's meat, which clinically has more than 75 active compounds that function as antiseptic, anti-fungal, anti-inflammatory, and wound healing<sup>9</sup>.

Aloe vera's mechanism in reducing perineal pain is through anthraquinones, allantoin, and other polysaccharides compound that will inhibit histamine and bradykinin synthesis. This inhibits prostaglandin formation and finally prevents the inflammatory process, reducing the pain sensation<sup>10</sup>. Studies on using aloe vera gel and ice gel compresses have been extensively done and have proven their effectiveness. However, the differences between the two gel effectiveness have not been addressed. This study examines aloe vera gel's efficacy, and ice gel compresses in reducing the scale of perineal wound pain.

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## METHOD

### Study Design

This is quasi-experimental research.

### Setting and Respondent

The research was conducted in the Duta Mulya Majenang Hospital, Cilacap Regency, Central Java, in March 2020. The population was all post-partum mothers at the hospital. Its sample was 56 respondents<sup>5</sup>. The inclusion criteria are 2-hour puerperal mothers, vaginal delivery, second-degree perineal wounds sutured with chromic catgut thread, no history of cold allergy and aloe vera gel, willing to be respondents, and no disabilities such as deaf, blind, mute, or mental disorders. Exclusion criteria include post-partum mothers with grade I, III, IV perineal wounds, those given analgesics, and those having comorbidities. The sampling technique was done by using a consecutive sampling technique.

### Experimental Procedure

The intervention group was given aloe vera gel compresses. An aloe vera gel measuring 5 cm x 5 cm x 1 cm was wrapped in sterile gauze and then compressed into the respondent's perineum's wound area for 30 minutes at 2-hrs of post-partum. It was repeated at 6-hrs post-partum for 30 minutes. Meanwhile, the counterpart group was given ice gel compresses. An ice gel in size of 10 cm x 8 cm x 1 cm, which has been stored in a freezer of 10°C, packed in sterile gauze, then it was compressed into the perineal wound at the same time and interval.

### The Variable, Instrument, and Measurement

The variable in this study is the pain scale, which was measured before and after the treatment. The instrument used was Numeric Rating Scale (NRS)<sup>12</sup>. Pain scale measurement was done 2 hours (before intervention) and 6 hours after the intervention.

### Data Analysis

The data analysis employed the Wilcoxon test to determine the effect of aloe vera, and ice gel compresses to reduce pain scales. The Mann Whitney test examines the difference in the effectiveness of the two gels in easing the pain<sup>13</sup>.

### Ethical Consideration

This research had been permitted to be carried out based on a letter from the ethics committee of the University of Respati I Yogyakarta with a registration number: 051.3 /FIKES /PL /II/2020.

## RESULTS

A normal-age group dominated the respondents compared to the high-risk age group from their characteristics. Meanwhile, based on their parity, most of them were multiparous. The respondents' initial pain scale varied greatly from mild, moderate to severe pain (Table 1). Table 2 showed that the interventions with aloe vera gel compresses could reduce the perineal wound pain scale. Likewise, the ice gel was also effective,  $p < 0.001$ . However, based on statistical analysis (Table 3), there was a difference in the mean reduction of pain by 0.85 between the two techniques ( $p < 0.05$ ) for the aloe vera superiority. It means that the aloe vera gel compress was more effective than its counterpart in reducing the pain.

**Table 1.** Characteristics of Respondent (n=56)

Characteristics	Frequency	Percentage
<b>Age (yrs)</b>		
<20 and >35	18	32.1%
20 – 35	38	67.9%
<b>Parity</b>		
Primipara	21	37.5%
Multipara	35	62.5%
<b>Pain scale</b>		
Mild	16	28.5%
Moderate	35	62.5%
Severe	5	9%

**Table 2.** Pain Scale Before and After the Intervention of the Aloe Vera Gel and Ice Gel Groups.

Group		Mean $\pm$ SD	Z	p-value
Aloe vera gel	Pre	4.96 $\pm$ 1.374	-4.657	0.0001
	Post	2.25 $\pm$ 1.041		
Ice gel	Pre	4.14 $\pm$ 1.145	-4.501	0.0001
	Post	2.14 $\pm$ 1.239		

Wilcoxon test

**Table 3.** The Difference of Pain Scale Between the Aloe Vera Group and Ice Gel Group.

Group	Mean $\pm$ SD	Mean difference	U	p-value
Aloe vera	2.46 $\pm$ 1.374	0.85	- 2.550	0.011
Ice gel	1.61 $\pm$ 0.832			

Mann Whitney test

## DISCUSSION

The results showed a significant effect in the aloe vera gel compress intervention to reduce the pain. This was seen from the decrease in the respondent's pain scale score before and after being given the intervention<sup>14</sup>. Aloe vera gel compresses are more effective than the ice gel because it contains natural antibiotics<sup>9</sup>. Its working effect and its extracts have been tested to penetrate the skin's stratus corneum layer so that it becomes an effective therapy<sup>15</sup>. The gel has been proven to increase the synthesis of glycosaminoglycan (Asam hyaluronic dan dermatan sulfate) component on the wound healing matrix to boost collagen in the wound granulating process<sup>16</sup>. It has an anti-inflammatory effect<sup>17</sup>. Its salicylic acid content plays a role in inhibiting the formation of bradykinin and histamine and preventing the oxidation of arachidonic acid. This blocks prostaglandin synthesis shortens the inflammatory process, and accelerates wound healing<sup>18</sup>.

The process of decreasing the pain occurs due to the inhibition of the inflammatory process and the granulation process's acceleration. Besides, aloe vera gel contains amino acetic, which can overcome pain; these plants' analgesic effect works through peripheral mechanisms<sup>19</sup>. Using aloe vera gel compress accelerates the healing process of post-partum wounds and relieves the pain naturally.

A significant effect was also found out in the ice gel compresses to decrease the respondents' pain scale scores. It comes from the cold sensation provided by the ice gel. It can reduce pain in two ways: first, by reducing edema, muscle spasm associated with inflammatory reactions or trauma, secondly reducing pain by inducing short-term pain sensations in peripheral nerve fibers and reducing the inflammatory response. Cold therapy makes skin, and its underlying tissue becomes cooler, thereby activating alpha receptors in the blood, stimulating the sympathetic nervous system to reduce blood flow to the wound's area. This reduces the pain, as it is proved in another study<sup>20</sup>.

The ice gel was given for 10 to 30 minutes<sup>21</sup>. This therapy is cheap, safe, easy to use, and it indeed has no side effects<sup>22</sup>. In this study, the ice gel treatment significantly reduced the respondent's pain scale. This indicated that ice gel compressing had an analgesic effect<sup>23</sup>, but it did not have any active substances or compounds that could accelerate the wound healing process. This indirectly would affect the pain frequency in respondents.

The perineal wound's pain can be reduced because aloe vera gel, apart from relieving pain, has active compounds to inhibit the inflammatory process and speed up the wound healing process. As the wound healing process goes faster, the pain scale will indirectly decrease. Aloe vera contains more than 75 potentially active ingredients,

including vitamins, enzymes, minerals, sugars, lignin, saponins, salicylic acids, and amino acids<sup>6</sup>. Due to its rich content of these benefits, aloe vera is widely used for treatment and various pathological conditions, one of which is for wound healing<sup>24</sup>. The aloe vera gel is clinically tested to accelerate the internal wound healing process<sup>10</sup>, such as peptic ulcer and external, such as dermal or subdermal<sup>19</sup>. It can also reduce pain due to magnesium lactate in aloe vera gel, which is used as an anti-itching and analgesic drug by inhibiting histidine-decarboxylase, which controls the conversion of histidine to histamine in mast cells<sup>25</sup>.

This study's weakness is that the variables examined do not represent all the factors that can affect pain. The formula was still in its original form, making it challenging to apply.

## CONCLUSIONS AND RECOMMENDATION

Aloe vera gel compresses are more effective at reducing the intensity of perineum pain in post-partum mothers. Therefore, it is recommended to be used as an alternative therapy to reduce wound pain in post-partum mothers. Further research is suggested to undertake for using aloe vera gel cream to make it easier to apply.

## REFERENCES

1. Nisbet G, Sehgal A. Pharmacology in the management of chronic pain. *Anaesth Intensive Care Med.* 2019;20(10):555-558. doi:10.1016/j.mpaic.2019.07.009
2. Thomson G, Feeley C, Moran VH, Downe S, Oladapo OT. Women's experiences of pharmacological and non-pharmacological pain relief methods for labour and childbirth: a qualitative systematic review. Published online 2019.
3. Ito S. Mother and Child: Medication Use in Pregnancy and Lactation. *Clin Pharmacol Ther.* 2016;100(1):8-11. doi:10.1002/cpt.383
4. Vance CGT, Dailey DL, Rakel BA, Sluka KA. Using TENS for pain control: *the state of the evidence.* *Pain Manag.* 2014;4(3):197-209. doi:10.2217/pmt.14.13
5. Francisco AA, De Oliveira SMJV, Steen M, Nobre MRC, De Souza EV. Ice pack induced perineal analgesia after spontaneous vaginal birth: Randomized controlled trial. *Women Birth.* 2018;31(5):e334-e340. doi:10.1016/j.wombi.2017.12.011
6. Menezes PM. Effectiveness of Aloe Vera Gel Vs Lavender Oil on Episiotomy Wound among Postnatal Mothers in a Selected Hospital, Mangalore. *Int J Nurs Midwifery Res.* 2017;04(03):48-54. doi:10.24321/2455.9318.201732
7. Purwaningsih A, Rahayu H, Wijayanti K. Effectiveness of warm compress and cold

- compress to reduce laceration perineum pain on primiparous at Candimulyo Magelang 2015. *Int J Res Med Sci*. Published online 2015:S24-S29. doi:10.18203/2320-6012.ijrms20151516
8. Lu Y-Y, Su M-L, Gau M-L, Lin K-C, Au H-K. The efficacy of cold-gel packing for relieving episiotomy pain - a quasi-randomised control trial. *Contemp Nurse*. 2015;50(1):26-35. doi:10.1080/10376178.2015.1010257
  9. Kumar R, Singh AK, Gupta A, Bishayee A, Pandey AK. *Therapeutic potential of Aloe vera—A miracle gift of nature. Phytomedicine*. Published online July 1, 2019. doi:10.1016/j.phymed.2019.152996
  10. Rathor N, Mehta AK, Sharma AK, Mediratta PK, Sharma KK. *Acute effect of Aloe vera gel extract on experimental models of pain. Inflammation*. 2012;35(6):1900-1903. doi:10.1007/s10753-012-9512-z
  11. Lemeshow S, Jr DWH, Klar J, Lwanga SK. *Adequacy of Sample in Health Studies*. 1st ed. John Wiley & Sons Ltd; 1990.
  12. Grove, Susan K., Jennifer R. Gray. NB. *Understanding Nursing Research Building an Evidence-Based Practice*. Vol 15.; 2015. doi:10.2307/486972
  13. Siswosudarmo R. *Pendekatan Praktis Penelitian Epidemiologi Klinis Dan Aplikasi SPSS Untuk Analisis Statistika*. Vol 1.; 2015.
  14. Radha MH, Laxmipriya NP. Evaluation of biological properties and clinical effectiveness of Aloe vera: A systematic review. *J Tradit Complement Med*. 2015;5(1):21-26. doi:10.1016/j.jtcme.2014.10.006
  15. Laux A, Gouws C, Hamman JH. Aloe vera gel and whole leaf extract: functional and versatile excipients for drug delivery? . *Expert Opin Drug Deliv*. Published online October 5, 2019:1-3. doi:10.1080/17425247.2019.1675633
  16. Long V. Aloe Vera in Dermatology-The Plant of Immortality. *JAMA dermatology*. 2016;152(12):1364. doi:10.1001/jamadermatol.2016.0077
  17. Sun YN, Li W, Yang SY, Kang JS, Ma JY, Kim YH. Isolation and identification of chromone and pyrone constituents from Aloe and their anti-inflammatory activities. *J Funct Foods*. 2016;21:232-239. doi:10.1016/j.jff.2015.12.026
  18. Eghdampour F, Jahdie F, Kheyrikhah M, Taghizadeh M, Naghizadeh S, Hagani H. The Impact of Aloe vera and Calendula on Perineal Healing after Episiotomy in Primiparous Women: A Randomized Clinical Trial. *J caring Sci*. 2013;2(4):279-286. doi:10.5681/jcs.2013.033
  19. Aysan E, Bektas H, Ersoz F. A new approach to postoperative peritoneal adhesions: prevention of peritoneal trauma by aloe vera gel. *Eur J Obstet Gynecol Reprod Biol*. 2010;149(2):195-198. doi:10.1016/j.ejogrb.2009.11.019
  20. Senol DK, Aslan E. The Effects of Cold Application to the Perineum on Pain Relief After Vaginal Birth. *Asian Nurs Res (Korean Soc Nurs Sci)*. 2017;11(4):276-282. doi:10.1016/j.anr.2017.11.001
  21. de Souza Bosco Paiva C, Junqueira Vasconcellos de Oliveira SM, Amorim Francisco A, da Silva RL, de Paula Batista Mendes E, Steen M. Length of perineal pain relief after ice pack application: A quasi-experimental study. *Women Birth*. 2016;29(2):117-122. doi:10.1016/j.wombi.2015.09.002
  22. Susilawati E, Ilda WR. Efektifitas Kompres Hangat Dan Kompres Dingin Terhadap Intensitas Nyeri Luka Perineum Pada Ibu Post Partum Di Bpm Siti Julaeah Pekanbaru. *J Midwifery Sci*. 2019;3(1):7-14.
  23. Beleza ACS, Ferreira CHJ, Driusso P, dos Santos CB, Nakano AMS. Effect of cryotherapy on relief of perineal pain after vaginal childbirth with episiotomy: a randomized and controlled clinical trial. *Physiother (United Kingdom)*. 2017;103(4):453-458. doi:10.1016/j.physio.2016.03.003
  24. Molazem Z, Mohseni F, Younesi M, Keshavarzi S. Aloe vera gel and cesarean wound healing; a randomized controlled clinical trial. *Glob J Health Sci*. 2015;7(1):203-209. doi:10.5539/gjhs.v7n1p203
  25. Varaei S, Mohaddes Ardabili F, Sabaghzadeh Irani P, Ranjbar H. The Effect of Aloe Vera Gel and Nitrofurazone on Dressing Related Pain of Superficial Burn Wounds. *World J Plast Surg*. 2017;6(2):254-256. Accessed November 5, 2019.