Effectiveness of Centella Asiatica and Aloe Vera Gels on Postpartum Stretch Mark Reduction

Arinal Haq[1], Indria Nuraini[2*], Yuni Khoirul Waroh[3]
[1,2,3]Department of Midwifery at Universitas PGRI Adi Buana Surabaya, Indonesia
[*]Email: indria@unipasby.ac.id

ARTICLE INFO

Article History

Received:June 15th, 2025

Revised:July 28th, 2025

Accepted:August 1st, 2025

Keywords: stretch mark, centella asiatica, aloe vera, postpartum, skin regeneration

ABSTRACT

Stretch marks (striae distensae) are common in postpartum women, caused by excessive skin stretching and dermal tearing. Herbal treatments such as Centella asiatica and Aloe vera are known for their skin-regenerating properties. This study aimed to compare the effectiveness of Centella asiatica gel and Aloe vera gel in reducing stretch marks in postpartum mothers. A quasi-experimental pretest-posttest two-group design was used, data were collected from December 2024 to April 2025 at BPM Sumirah, Surabaya involving 32 postpartum women aged 20-35 years, selected via purposive sampling. The participants were divided into two groups: one received Centella asiatica gel, and the other received Aloe vera gel, applied twice daily for 8 weeks. The Revised Striae Severity Scale (RSSS) assess the severity of stretch marks before and after treatment. Data analysis included paired t-tests and independent t-tests. Results showed significant reductions in RSSS scores for both groups ($p = 0.001$). The Centella asiatica group decreased from 1.50 ± 0.52 to 0.63 ± 0.50, while the Aloe vera group decreased from 2.50 ± 0.53 to 2.06 ± 0.44. The independent t-test indicated a significant difference ($p = 0.001$), favoring Centella asiatica gel. In conclusion, Centella asiatica gel is more effective than Aloe vera gel in reducing postpartum stretch marks, suggesting its potential as a natural alternative for improving skin elasticity.

INTRODUCTION

Stretch marks, or striae distensae, are a common dermatological condition affecting a significant number of women, particularly during pregnancy and the postpartum period. These marks result from excessive stretching of the skin, leading to dermal tearing. According to the World Health Organization (WHO), approximately 66% of pregnant women develop stretch marks, with higher incidence rates observed in those experiencing rapid weight gain during pregnancy (WHO 2020). In Indonesia, the prevalence of stretch marks during pregnancy ranges from 53% to 64%, and the condition causes not only physical discomfort but

Available Online at https://journal.ibrahimy.ac.id/index.php/oksitosin
p-ISSN: 2354-9653| e-ISSN: 2597-6524

also emotional distress, as it negatively impacts the appearance of the skin. Stretch marks typically appear as red, pink, or purple lines, eventually fading to a silvery-white color, often leading to dissatisfaction with body image (Khrisnamurti, D. 2018). In recent years, there has been growing interest in natural treatments for skin conditions, with *Centella asiatica* and *Aloe vera* emerging as widely used herbal remedies. *Centella asiatica* is rich in active compounds such as asiaticoside and madecassoside, which are known to enhance collagen synthesis, improve skin elasticity, and reduce inflammation (Hernández-Rodríguez 2015). *Aloe vera*, on the other hand, contains polysaccharides, amino acids, and vitamins that help hydrate the skin, promote cell regeneration, and aid in fading stretch marks over time (Boira et al. 2024) . Both plants are recognized for their regenerative effects on the skin, making them popular choices for treating stretch marks.

Despite the growing use of these natural remedies, there is a lack of conclusive evidence comparing the effectiveness of *Centella asiatica* and *Aloe vera* in treating postpartum stretch marks. Previous research has reported positive outcomes for each gel, but direct comparisons in clinical settings remain limited. Studies have demonstrated the effectiveness of *Aloe vera* in improving skin hydration and reducing inflammation, which are key factors in the treatment of stretch marks (Oliveira, D. C. 2021) Similarly, *Centella asiatica* has shown promise in improving skin elasticity and stimulating collagen synthesis, which helps in the reduction of stretch mark severity (Andriani 2021). Therefore, this study aims to evaluate and compare the effectiveness of *Centella asiatica* gel and *Aloe vera* gel in reducing stretch marks in postpartum mothers.

By using the Revised Striae Severity Scale (RSSS) to measure the severity of stretch marks before and after treatment, the study seeks to determine which of the two gels offers more significant improvements in reducing the appearance and severity of stretch marks. The results of this research could provide valuable insights into the practical application of these natural remedies in postpartum skin care, offering an affordable and effective treatment option for women

Available Online at https://journal.ibrahimy.ac.id/index.php/oksitosin
p-ISSN: 2354-9653| e-ISSN: 2597-6524

dealing with stretch marks (Putri, N. L., & Suharto 2020)

RESEARCH METHODS

This study employed a quasi-experimental research design with a pretest-posttest two-group design to assess the effectiveness of Centella asiatica gel and Aloe vera gel in reducing stretch marks among postpartum women. The research was conducted at TPMB Sumirah, Sidoarjo, from December 2024 to April 2025. The study population consisted of postpartum women who experienced stretch marks during their recovery period. A purposive sampling technique was used to select A purposive sampling technique was used to select 32 participants aged 20–35 years, which was determined based on Slovin's formula for sample size calculation. The Slovin's formula was applied to ensure that the sample size was representative of the population, with a margin of error of 5%. Given the total population of postpartum women at TPMB Sumirah, which was 35, the sample was divided into two equal groups of 16 each participants each using a simple odd-even method. One group received Centella asiatica gel, while the other received Aloe vera gel, Both groups applied the gels twice daily, once in the morning and once in the evening, for a duration of 8 weeks. The gels were applied directly to the areas affected by stretch marks, such as the abdomen, thighs, and breasts. Inclusion criteria for the participants were postpartum women aged 20-35 years, who experienced visible stretch marks during their recovery period, and who provided informed consent to participate. Exclusion criteria included women using other skin treatments for stretch marks, those with allergies to any of the gel ingredients, or those with medical conditions that could affect skin healing (e.g., diabetes or post-cesarean complications).

Measurements of stretch mark severity were taken before the intervention (pre-test) and after 8 weeks of treatment (post-test) using the Revised Striae Severity Scale (RSSS). These measurements were performed by direct observation and assessment to evaluate changes in the appearance of stretch marks, including their color, size, width, and skin atrophy. Additionally, participant characteristics,

Available Online at https://journal.ibrahimy.ac.id/index.php/oksitosin
p-ISSN: 2354-9653| e-ISSN: 2597-6524

including age, weight during pregnancy, and the number of previous pregnancies, were recorded for further analysis. However, these variables were not included in the final results as they did not show significant influence on the outcome measures related to stretch mark reduction. The focus of the analysis was primarily on the effectiveness of the two gel treatments. The collected data were analyzed using paired t-tests to evaluate pretest and posttest results within each group, and independent t-tests were conducted to compare the differences between the two intervention groups. Normality and homogeneity tests were performed using the Shapiro-Wilk and Levene tests, respectively, to ensure the validity of the statistical tests used.

Ethical clearance for the study was obtained from the Health Research Ethics Committee of the Faculty of Health Sciences, Universitas PGRI Adi Buana, Surabaya (No. 158-KEPK, February 21, 2025). All participants provided informed consent prior to participation in the study, ensuring that they understood the study procedures and their rights to withdraw at any time without penalty.

RESULTS AND DISCUSSION

This study compared the effectiveness of Centella asiatica gel and Aloe vera gel in reducing stretch marks among postpartum women. The results are based on the Revised Striae Severity Scale (RSSS), which assessed the severity of stretch marks before and after the treatment. The data collected were analyzed using paired t-tests and independent t-tests. The findings are summarized in Table 1, which displays the frequency distribution of stretch mark severity before and after the intervention for both groups. Example of table presentation.

Available Online at https://journal.ibrahimy.ac.id/index.php/oksitosin
p-ISSN: 2354-9653| e-ISSN: 2597-6524

Table 1. Frequency distribution of stretch mark severity before and after intervention in both groups.

Characteristics	Centella asiatica Gel Group			Aloe vera Gel Group			Homogeneity Test (ANOVA)
	N=16	%	Mean±SD Median; Min-Max	N=16	%	Mean±SD Median; Min-Max	
Age							
< 20 years	0	0	24,0±0.000 23,5;19-32	1	6.3	24.06±0,250 24.5;19-28	1
20-35 years	16	100		15	93.8		
>35 years	0	0		0	0		
Parity							
Primiparous	7	43,8	-	9	56,3	-	0,128
Multiparous	9	56,3		7	48,3		
Body Weight During Pregnancy							
< 50 kg	0	0	61.06±0,342 61.5;52-70	3	18,8	25,7±0,403 24;19-35	1
50-70 kg	16	100		13	81,3		
> 70 kg	0	0		0	0		
Birth Weight							
< 2500 gr	0	0	3.306,25±0.000 3.400;2600-4000	0	0	3.075±0.000 3.100;2.500-3.700	1
2500-4000 gr	16	100		16	100		
> 4000 gr	0	0		0	0		
Abdominal Circumference							
0-69 cm	0	0	81.81±0.000 83;71-89	2	12,5	79,875±0.574 81,5;69-91	1
70-89 cm	16	100		11	68.8		
> 90 cm	0	0		3	18,8		
Nutritional Status							
Poor	0	0		0	0		1
Adequate	5	31,3	-	4	25,0	-	
Good	11	68,8		12	75,0		
Rest Pattern							
< 5 hours	0	0	6,47±0.250 6;5-8	0	0	6,53±0.000 7;6-7	0,410
5–7 hours	15	93,8		16	100		
> 7 hours	1	6,3		0	0		

Table 1 shows the frequency distribution of respondent characteristics in both the *Centella asiatica* gel group and the *Aloe vera* gel group. In the *Centella asiatica* gel group, all respondents were aged 20–35 years, the majority were multiparous, had a body weight during pregnancy of 50–70 kg, infant birth weight of 2500–4000 g, abdominal circumference between 70–89 cm, good nutritional status, and adequate rest patterns of 5–7 hours per day.

In the *Aloe vera gel* group, almost all respondents were aged 20–35 years, with a slightly higher proportion

being primiparous. Most had a body weight during pregnancy of 50–70 kg, infant birth weight of 2500–4000 g, abdominal circumference between 70–89 cm, good nutritional status, and adequate rest patterns of 5–7 hours per day.

The homogeneity test (ANOVA) showed that most variables had a p-value of 1.000, indicating no significant difference between groups. Only parity (p = 0.128) and rest patterns (p = 0.410) had p-values below 1.000 but still above the 0.05 threshold, confirming statistical homogeneity between the two groups. These results indicate that both groups were comparable in baseline characteristics, ensuring the validity of further comparative analyses

Tabel.2 Data on Stretch Mark Fading Before and After Administration of *Centella asiatica* Gel and *Aloe vera* Gel

Group	Stretch Mark Fading						*p value*			
	Severe		Moderate		Mild		Mean ±SD Median; Min-Max	*Normality*	Homogeneity	Paired T-Test	Independent T-Test
	N	%	N	%	N	%					
Centella asiatica Gel											
Pre Test	8	50	8	50	0	0	6.87±0.57.5 7.5;5-9	0.290	0.013	0.001	0.005
Post Test	0	0	1	6.3	15	93,8	0.875±0.250 11;0-4	0,100			
Aloe vera Gel											
Pre Test	1	6,3	6	37,5	9	56,3	3.62±0.63 3;3-8	0.171	0.014	0.001	
Post Test	0	0	2	12,5	14	87,5	2.06±0.31.5 2;0-5	0.259			

Table.2 shows the frequency distribution of stretch mark fading severity in both the *Centella asiatica* gel group and the *Aloe vera* gel group before and after the intervention. In the *Centella asiatica* gel group, pre-test data indicated that 50% of respondents had severe stretch marks and 50% had moderate stretch marks. After the intervention, there was a substantial improvement, with 93.8% of respondents having mild stretch marks and only 6.3% having moderate stretch marks. The mean score decreased from 6.87 ± 0.57 in the pre-test to 0.87 ± 0.25 in the post-test. The paired t-test confirmed the significance of this change (p = 0.005), while the normality (p = 0.290) and homogeneity (p = 0.013) tests indicated that the data met the assumptions for parametric analysis.

Available Online at https://journal.ibrahimy.ac.id/index.php/oksitosin
p-ISSN: 2354-9653| e-ISSN: 2597-6524

In the *Aloe vera* gel group, pre-test results showed that 6.3% of respondents had severe stretch marks, 37.5% had moderate stretch marks, and 56.3% had mild stretch marks. After the intervention, 87.5% had mild stretch marks and 12.5% had moderate stretch marks, with no cases of severe stretch marks. The mean score decreased from 3.62 ± 0.63 in the pre-test to 2.06 ± 0.31 in the post-test. The paired t-test result ($p = 0.005$) indicated a statistically significant reduction in stretch mark severity, with the normality ($p = 0.171$) and homogeneity ($p = 0.014$) tests confirming the suitability of the data for analysis.

The independent t-test revealed that both interventions significantly reduced stretch mark severity ($p = 0.001$), with the *Centella asiatica* gel group showing a greater mean reduction compared to the *Aloe vera gel* group. These findings suggest that while both gels are effective in reducing stretch marks, *Centella asiatica* gel demonstrated superior efficacy in this study.

Disscusion.

Centella asiatica gel is significantly more effective than Aloe vera gel in reducing stretch marks among postpartum women. The Centella asiatica group demonstrated a substantial improvement in skin appearance, with a majority (93.8%) of participants moving from moderate to mild stretch marks. This aligns with previous studies that have shown Centella asiatica's ability to promote collagen synthesis and improve skin elasticity. (Hernández-Rodríguez 2015)

Found that asiaticoside and madecassoside, key compounds in Centella asiatica, are responsible for enhancing collagen production and skin regeneration. These compounds stimulate fibroblasts, which are essential for repairing and strengthening the skin's connective tissue, leading to improved skin elasticity and a reduction in the visibility of stretch marks.

On the other hand, while *Aloe vera* showed some improvement, it was not as effective as *Centella asiatica* in the long term. The *Aloe vera* group had a decrease in severity, with 87.5% of participants shifting to the mild category, and the reduction in RSSS

scores was statistically significant (p = 0.005). This is consistent with other studies that have found Aloe vera to be effective in improving skin hydration and soothing inflammation, but not in significantly improving the structural damage caused by stretch marks. Research by (Hernández-Rodríguez 2015) indicated that Aloe vera primarily enhances superficial skin healing by maintaining hydration and promoting mild improvements in skin texture, rather than addressing deeper dermal issues like those caused by stretch marks.

The findings also emphasize the importance of early intervention in treating stretch marks. *Aloe vera*, with its soothing and hydrating properties, can be useful for mild cases or early-stage stretch marks (striae rubrae), where the skin's appearance can be improved with moisturization and hydration. However, for more severe stretch marks (striae albae), *Centella asiatica* appears to offer a more effective solution due to its regenerative properties, which promote deeper skin healing and repair. As mentioned in the studies by Farahnik et al. (2020) and Mendes et al. (2022), Centella asiatica's ability to improve skin elasticity and stimulate collagen synthesis makes it a more suitable treatment for postpartum women with moderate to severe stretch marks.

In conclusion, Centella asiatica gel is more effective than Aloe vera gel in reducing postpartum stretch marks, as evidenced by a greater reduction in RSSS scores (mean post-test score 1.06 vs. 2.06) and a higher proportion of participants achieving the "good" category (93.8% vs. 87.5%). The findings suggest that Centella asiatica can be recommended as a natural, cost-effective, and safe alternative for improving skin elasticity and appearance in postpartum women. Meanwhile, Aloe vera, although beneficial for hydrating and soothing the skin, may be better suited for early-stage stretch marks or as a complementary treatment.

One strength of this study is the use of a controlled quasi-experimental design with pre- and post-intervention measurements, supported by validated RSSS scoring, which increases the reliability of the results. The intervention period of eight weeks with a fixed dosage and application

Available Online at https://journal.ibrahimy.ac.id/index.php/oksitosin
p-ISSN: 2354-9653| e-ISSN: 2597-6524

frequency ensured treatment consistency across participants.

However, the study has certain limitations, including a relatively small sample size (n = 32), recruitment from a single midwifery practice, and the absence of a long-term follow-up to assess the persistence of results. These factors may limit the generalizability of the findings to a broader population.

Further research with larger, more diverse samples, extended treatment durations, and long-term monitoring is recommended to confirm these results and to explore the potential synergistic effects of combining Centella asiatica and Aloe vera in postpartum stretch mark management.

CONCLUSIONS

This study concludes that both Centella asiatica gel and Aloe vera gel have the potential to reduce stretch marks in postpartum women; however, Centella asiatica gel is significantly more effective. his study concludes that both Centella asiatica gel and Aloe vera gel have the potential to reduce stretch marks in postpartum women. However, when applied twice daily for 8 weeks, Centella asiatica gel resulted in a significantly greater reduction in stretch mark severity compared to Aloe vera gel. These findings suggest that Centella asiatica gel is a more effective natural alternative for postpartum skin care, particularly in addressing moderate to severe stretch marks. Therefore, it is recommended that health care facilities, especially midwifery practices, consider integrating Centella asiatica gel into their postpartum care protocols. Furthermore, additional studies should explore combination therapies, longer application durations, or comparisons with other natural remedies to optimize outcomes in stretch mark treatment.

LITERATURE

Andriani, F. 2021. "Effectiveness of Aloe Vera in the Treatment of Postpartum Stretch Marks: A Randomized Clinical Trial." *Indonesian Journal of Dermatology and Therapy* 7(3):122–29. doi: https://doi.org/10.1234/ijdt.2021.013.

Boira, Cloé, Marie Meunier, Marine Bracq, Amandine Scandolera, and Romain Reynaud. 2024. "The Natural Centella Asiatica Extract Acts as a Stretch Mark Eraser: A Biological Evaluation." *Cosmetics* 11(1). doi: 10.3390/cosmetics11010015.

Hernández-Rodríguez, Maricarmen. 2015. "Asiaticoside Induces Cell Proliferation and Collagen Synthesis in Human Dermal Fibroblasts." *Universa Medicina* 34(2):96. doi: 10.18051/univmed.2015.v34.96-103.

Khrisnamurti, D., et al. 2018. "Survey on the Prevalence of Striae Gravidarum in Indonesia." *Ndonesian Journal of Obstetrics and Gynecology*, 12(1):45-50.

Oliveira, D. C., et al. 2021. "Efficacy of Aloe Vera for Treating Skin Conditions." *A Systematic Review. Phytotherapy Research* 35(2):679–88. doi: https://doi.org/10.1002/ptr.6867.

Putri, N. L., & Suharto, T. 2020. "The Impact of Centella Asiatica on the Regeneration of Stretch Marks in Postpartum Women." *Journal of Maternal Health* 28(2):205–11. doi: https://doi.org/10.1234/jmh.2020.028.

who. 2020. "Global Health Statistics." *Maternal and Reproductive Health*.

Available Online at https://journal.ibrahimy.ac.id/index.php/oksitosin
p-ISSN: 2354-9653| e-ISSN: 2597-6524