Original Article

Effect of Topical Aloe Vera Gel on Pregnancy-Associated Striae: A Randomized Placebo-Controlled Clinical Trial

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Abstract

Background: Striae gravidarum are common pregnancy-associated skin changes, and effective topical interventions remain insufficiently established. Aloe vera has potential skin-hydrating and anti-inflammatory properties. This study evaluated the effects of topical Aloe vera gel on striae count, daily itching frequency, and erythema severity during pregnancy.

Methods: This randomized, double-blind, placebo-controlled trial included 144 primigravid women with singleton pregnancies and no abdominal striae at baseline. Participants received topical Aloe vera gel or placebo (72 per group), applying approximately 5 g daily to the abdomen from gestational weeks 20 to 28. At week 28, striae count (1–2 or 3–8), daily itching frequency (1–2, 3–4, or 5–6 episodes), and erythema severity were assessed. Abdominal circumference was measured at weeks 20 and 28.

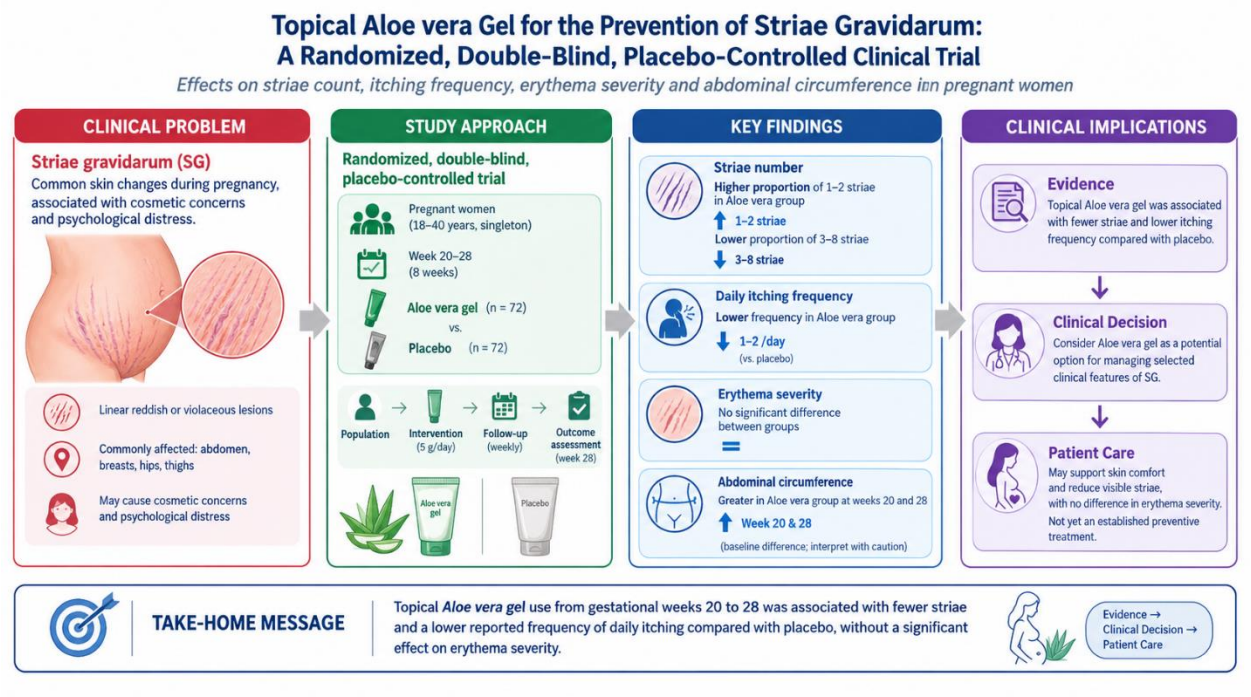
Results: Striae count categories differed significantly between groups ($\chi^2 = 26.70$, $P < 0.001$). The proportion with 1–2 striae was 70.8% in the Aloe vera group and 27.8% in the placebo group. Itching frequency also differed significantly ($\chi^2 = 18.06$, $P < 0.001$), with 59.7% and 25.0%, respectively, reporting itching 1–2 times daily. Erythema severity did not differ significantly ($\chi^2 = 3.606$, $P = 0.307$). Abdominal circumference was greater in the Aloe vera group at weeks 20 and 28; however, the baseline difference limits interpretation of the follow-up comparison.

Conclusion: Topical Aloe vera use was associated with a more favorable distribution of striae counts and lower itching frequency, but not significantly different erythema severity. Further trials are needed to confirm these findings.

Implications for Patient Care: Topical Aloe vera gel may help reduce striae count and itching frequency during pregnancy, but further trials are needed before it can be recommended as an established preventive treatment for striae gravidarum.

Keywords: Aloe Vera; Striae Gravidarum; Pregnancy; Pruritus; Erythema; Randomized Controlled Trial.

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Graphical Abstract. Topical Aloe Vera Gel for the Prevention of Striae Gravidarum: A Randomized, Double-Blind, Placebo-Controlled Clinical Trial. Striae gravidarum are common pregnancy-related skin changes that may cause cosmetic concerns and discomfort. In this trial, topical Aloe vera gel applied daily from gestational weeks 20 to 28 was associated with a more favorable distribution of striae counts and a lower reported frequency of daily itching compared with placebo. However, no statistically significant between-group difference was observed in erythema severity. These findings suggest a potential benefit of topical Aloe vera for selected clinical features of striae gravidarum, although further well-designed trials with standardized outcome assessment and longer follow-up are needed to confirm its efficacy and safety during pregnancy.

Introduction

Striae gravidarum (SG), commonly known as pregnancy stretch marks, are frequent cutaneous changes during pregnancy (1). They usually appear as linear reddish or violaceous lesions and may gradually become pale after pregnancy. The abdomen, breasts, hips, and thighs are commonly affected (1). Although SG is generally considered a benign condition, its visible appearance can cause cosmetic concerns and psychological distress in some women (2). The development of SG is multifactorial and is not fully understood. Mechanical stretching of the skin during pregnancy may contribute to lesion formation, but hormonal and genetic factors are also considered relevant (3). Alterations in collagen, elastic fibers, and other components of the extracellular matrix have been implicated in the pathophysiology of striae (3). Several maternal and pregnancy-related factors have been associated with SG, including younger maternal age and greater gestational weight gain, while family history and birth weight have been linked to more severe manifestations (4). However, the relationships between maternal characteristics and the clinical features of SG may vary across populations and remain relevant to further clinical investigation.

The high frequency of SG and the limited availability of established preventive interventions have led to considerable interest in topical preparations (5). Various topical preparations, including creams, lotions, ointments, and olive oil, have been investigated for the prevention of striae gravidarum (6). However, clinical evidence remains inconsistent,

and systematic reviews have not established a topical preparation that reliably prevents the development of SG (6). This uncertainty is clinically relevant because many commonly used products are recommended on the basis of limited or heterogeneous evidence. Aloe vera is a plant-derived preparation that has been widely used in topical skin care (7). Its gel contains bioactive constituents, including polysaccharides, that have been investigated for their potential role in skin repair and wound healing (8). Aloe vera has been investigated for its potential effects on skin hydration and local inflammation, supporting interest in its topical use for skin conditions (9).

The present randomized, double-blind, placebo-controlled clinical trial evaluated the effects of topical Aloe vera gel, applied daily from gestational weeks 20 to 28, on the clinical characteristics of striae gravidarum in pregnant women without abdominal striae at baseline. The outcomes included the number of striae, daily itching frequency, and erythema severity at the end of the intervention period. Abdominal circumference was also measured at weeks 20 and 28. In addition, exploratory analyses examined the associations of maternal age and BMI with the clinical outcomes among participants assigned to the Aloe vera group. This study aimed to provide clinical evidence on whether topical Aloe vera gel may influence the number of striae and associated symptoms during pregnancy.

Materials and Methods

Study design and participants

This randomized, double-blind, placebo-controlled clinical trial was conducted at the gynecology clinic of Shahid Rahimi Hospital, Khorramabad, Iran. The study evaluated the effects of daily topical Aloe vera gel on striae gravidarum over an 8-week period, from gestational week 20 to week 28. Pregnant women aged 18–40 years with a singleton pregnancy were eligible if they were primigravid, had a pre-pregnancy or early-pregnancy BMI within the eligibility range specified in the study protocol, and had no abdominal striae at baseline. Women with diabetes, chronic dermatological or systemic diseases that could affect the study outcomes, prolonged medication use, or other relevant conditions were excluded. Participants were monitored for local sensitivity reactions and adherence to the prescribed treatment during the intervention period. The final analysis included 144 participants, with 72 assigned to each group. A total of 144 participants were included in the reported analysis, with 72 assigned to each group. The sample size was calculated using the expected treatment difference from a previous clinical study (10), with an anticipated attrition rate of 10%. Eligible participants had a pre-pregnancy or early-pregnancy BMI of 18.5–29.9 kg/m².

Randomization, blinding, and intervention

Participants were randomly assigned in a 1:1 ratio to receive either Aloe vera gel or placebo using a computer-generated random allocation sequence. Allocation concealment was maintained using sequentially numbered, opaque, sealed envelopes. The study preparations were labeled with codes A and B. Participants, the outcome assessor, the personnel responsible for telephone follow-up, and the statistician were blinded to treatment allocation. Clinical assessments were performed by a trained midwife who was unaware of group assignments. Aloe vera leaves were obtained from a medicinal plant supplier in Lorestan Province, Iran. The gel was incorporated into a topical formulation containing 75% Aloe vera gel and 25% gel base, with a pH of approximately 6. The placebo contained the same gel base without Aloe vera. Both preparations were packaged in identical 100-g tubes. Participants in the intervention group applied approximately 5 g of Aloe vera gel

once daily to the entire abdominal area and gently rubbed it for approximately 2 min. Participants in the placebo group followed the same procedure using the placebo preparation. Treatment continued from gestational week 20 to week 28. Weekly telephone follow-up was conducted by personnel blinded to treatment allocation to assess adherence and identify local reactions or other adverse events.

Assessment of striae, pruritus, and erythema

Clinical assessments were performed by a trained outcome assessor who was unaware of treatment allocation. The number of abdominal striae, daily itching frequency, and abdominal erythema severity were assessed at the final visit (gestational week 28).

- Striae assessment. At the final visit (gestational week 28), the number of abdominal striae gravidarum was recorded by a trained outcome assessor who was unaware of treatment allocation. For analysis, participants were classified into two categories according to the recorded striae count: 1–2 striae and 3–8 striae. The distribution of these categories was compared between the Aloe vera and placebo groups.

- Pruritus assessment. Pruritus associated with striae gravidarum was assessed using the itching severity assessment method described by Dhiman et al. (11). Pruritus frequency was assessed at the final visit (week 28) and categorized as 1–2, 3–4, or 5–6 episodes per day. The distribution of these categories was compared between the Aloe vera and placebo groups.

- Erythema assessment. Abdominal erythema was assessed at the final visit (week 28) and graded on a four-point scale: 0, no erythema; 1, mild erythema (light red or pink); 2, red erythema; and 3, violaceous erythema (purple) (12). Only the erythema grade at the abdominal site was recorded**.**

Demographic and anthropometric variables and outcomes

Maternal age and BMI were recorded at baseline. Abdominal circumference was measured at gestational weeks 20 and 28 using the same procedure at both visits. The primary outcome was the distribution of abdominal striae count categories at week 28 (1–2 vs. 3–8 striae). Secondary outcomes were pruritus and erythema severity. Abdominal circumference was measured at gestational weeks 20 and 28, and between-group comparisons were performed separately at each time point. Exploratory analyses examined the relationships of maternal age and BMI with striae number, itching frequency, and erythema severity among women receiving Aloe vera.

Statistical analysis

Analyses were performed using IBM SPSS Statistics version 22.0 (IBM Corp., Armonk, NY, USA). Continuous variables were summarized as mean ± standard deviation (SD), and categorical variables as frequencies and percentages. Between-group differences in categorical variables were assessed using Pearson's chi-square test or Fisher's exact test, as appropriate. Independent-samples t-tests were used to compare continuous variables between two independent groups. One-way analysis of variance (ANOVA) was used to compare continuous variables across three or more groups, followed by Tukey's post hoc test when the overall ANOVA was statistically significant. Between-group comparisons of abdominal circumference were performed separately at weeks 20 and 28. All tests were two-sided, and $P < 0.05$ was considered statistically significant.

Ethical considerations

Written informed consent was obtained from all participants before enrollment. Participants were informed about the study procedures and

instructed to promptly report any local irritation, allergic reaction, skin sensitivity, or other adverse events during the intervention. Adherence and potential adverse events were monitored through weekly telephone follow-up, and participants were advised to seek appropriate medical assessment if any concerning symptoms occurred. Participation was voluntary, and confidentiality of participants' information was maintained throughout the study. The study was approved by the Ethics Committee of Lorestan University of Medical Sciences (approval code: IR.LUMS.REC.1403.004) and conducted in accordance with the Declaration of Helsinki.

Results

Baseline characteristics of the study participants

The baseline demographic and anthropometric characteristics of the participants are presented in Table 1. No statistically significant between-group differences were observed in the distributions of age categories (P = 0.106) or BMI categories (P = 0.076). However, abdominal circumference was significantly greater in the Aloe vera group than in the placebo group at baseline (71.76 ± 2.35 vs. 70.54 ± 1.76 cm, respectively; P = 0.001).

Variable	Aloe vera group, n (%)	Placebo group, n (%)	P value
Age (years)			
≤25	14 (19.4)	24 (33.3)	**0.106**
26–29	26 (36.1)	26 (36.1)	
≥30	32 (44.4)	22 (30.6)	
BMI (kg/m²)			
18.6–24.9	59 (81.9)	67 (93.1)	**0.076**
25.0–29.9	13 (18.1)	5 (6.9)	
Total	**72 (100.0)**	**72 (100.0)**	

Table 1. Baseline demographic and anthropometric characteristics of the study groups. Data are presented as n (%). P values were calculated using Pearson's chi-square test for age and Fisher's exact test for BMI.

Distribution of striae number between the Aloe vera and Placebo groups

The distribution of the number of striae differed significantly between the Aloe vera and Placebo groups (χ^2=26.70, df=1, P<0.001). In the Aloe vera group, 51 participants (70.8%) had 1–2 striae, whereas 21 (29.2%) had 3–8 striae. In the Placebo group, 20 participants (27.8%) had 1–2 striae and 52 (72.2%) had 3–8 striae. Thus, the Aloe vera group had a higher proportion of participants with 1–2 striae and a lower proportion with 3–8 striae than the placebo group (Table 2).

Striae number	Aloe vera group, n (%)	Placebo group, n (%)	Total, n (%)
1–2 striae	51 (70.8)	20 (27.8)	71 (49.3)
3–8 striae	21 (29.2)	52 (72.2)	73 (50.7)
Total	**72 (100.0)**	**72 (100.0)**	**144 (100.0)**

Table 2. Distribution of striae count categories in the Aloe vera and placebo groups. Data are presented as n (%). Percentages for each group are calculated within that group, whereas total percentages are calculated across the entire study population. The between-group comparison was performed using Pearson's chi-square test (χ^2 = 26.70, df = 1, P < 0.001). A P value <0.05 was considered statistically significant.

Distribution of Daily Itching Frequency between the Aloe vera and Placebo Groups

The distribution of daily itching frequency differed significantly between the Aloe vera and Placebo groups ($\chi^2(2)=18.06$, $P<0.001$). In the Aloe vera group, 43 participants (59.7%) reported itching 1–2 times per day, compared with 18 participants (25.0%) in the Placebo group. Itching 3–4 times per day was reported by 19 participants (26.4%) in the Aloe vera group and 32 participants (44.4%) in the Placebo group. The highest frequency category (5–6 times per day) was reported by 10 participants (13.9%) in the Aloe vera group and 22 participants (30.6%) in the placebo group. Overall, the Aloe vera group had a greater proportion of participants reporting itching 1–2 times per day and lower proportions reporting itching 3–4 or 5–6 times per day than the placebo group (Table 3).

Daily itching frequency	Aloe vera group, n (%)	Placebo group, n (%)	Total, n (%)
1–2 times/day	43 (59.7)	18 (25.0)	61 (42.4)
3–4 times/day	19 (26.4)	32 (44.4)	51 (35.4)
5–6 times/day	10 (13.9)	22 (30.6)	32 (22.2)
Total	**72 (100.0)**	**72 (100.0)**	**144 (100.0)**

Table 3. Distribution of Daily Itching Frequency in the Aloe Vera and Placebo Groups. Data are presented as n (%). Percentages within the Aloe vera and Placebo groups are column percentages; total percentages are based on the entire study population. P value was calculated using Pearson's chi-square test. $\chi^2(2)=18.06$, $P<0.001$. A P value <0.05 was considered statistically significant.

Distribution and Comparison of Erythema Severity Between Study Groups

The distribution of erythema severity was comparable between the Aloe vera and Placebo groups. In the intervention group, 21 participants (29.2%) had no erythema, 14 (19.4%) had light red or pink erythema, 17 (23.6%) had red erythema, and 20 (27.8%) had purple erythema. In the comparison group, 27 participants (37.5%) had no erythema, 14 (19.4%) had light red or pink erythema, 20 (27.8%) had red erythema, and 11 (15.3%) had purple erythema. Pearson's chi-square test showed no statistically significant difference in the distribution of erythema severity between the Aloe vera and placebo groups ($\chi^2 = 3.606$, df = 3, P = 0.307) (Table 4).

Erythema severity	Aloe vera group, n (%)	Placebo group, n (%)	Total, n (%)
No erythema	21 (29.2)	27 (37.5)	48 (33.3)
Light red or pink erythema	14 (19.4)	14 (19.4)	28 (19.4)
Red erythema	17 (23.6)	20 (27.8)	37 (25.7)
Purple erythema	20 (27.8)	11 (15.3)	31 (21.5)
Total	**72 (100.0)**	**72 (100.0)**	**144 (100.0)**
P value*	**0.307**		

Table 4. Distribution of Erythema Severity in the Aloe Vera and Placebo Groups. *Data are presented as n (%), with percentages calculated within each study group. The comparison was performed using Pearson's chi-square test. No statistically significant difference was observed in the distribution of erythema severity between the intervention and comparison groups ($\chi^2 = 3.606$, df = 3, P = 0.307).

Between-Group Comparison of Abdominal Circumference at Weeks 20 and 28

At week 20, the mean abdominal circumference was 71.76 ± 2.35 cm in the Aloe vera group and 70.54 ± 1.76 cm in the placebo group. The between-group difference was statistically significant (t = 3.518, df = 142, P = 0.001). At week 28, the mean abdominal circumference was 78.36 ± 1.80 cm in the Aloe vera group and 77.34 ± 2.09 cm in the placebo group, with a statistically significant between-group difference (t = 3.111, df = 142, P = 0.002). Thus, abdominal circumference was significantly greater in the Aloe vera group at both assessment time points. However, because a significant between-group difference was already present at baseline, the week-28 comparison should be interpreted cautiously and does not establish an independent treatment effect on abdominal circumference (Table 5).

Time point	Group	N	Mean	SD	t	df	P value*
Week 20	Aloe vera	72	71.76	2.35	3.518	142	**0.001**
	Placebo	72	70.54	1.76			
Week 28	Aloe vera	72	78.36	1.80	3.111	142	**0.002**
	Placebo	72	77.34	2.09			

Table 5. Between-Group Comparison of Abdominal Circumference at Weeks 20 and 28. *Data are presented as mean ± standard deviation (SD). Between-group comparisons at each time point were performed using an independent-samples t-test. A two-sided P value <0.05 was considered statistically significant.

Comparison of Maternal Age According to Striae Count in the Aloe Vera Gel Group

Among women in the aloe vera gel group, the mean maternal age was 28.92 ± 3.91 years among those with 1–2 striae and 29.00 ± 3.99 years among those with 3–8 striae. The difference in mean maternal age between the two groups was not statistically significant (t = −0.077, df = 70, P = 0.939) (Table 6).

Variable	Striae frequency	N	Mean ± SD	t	df	P value*
Maternal age (years)	1–2 striae	51	28.92 ± 3.91	−0.077	70	0.939
	3–8 striae	21	29.00 ± 3.99			

Table 6. Comparison of Maternal Age Between Striae Count Categories in the Aloe Vera Gel Group. * Data are presented as mean ± standard deviation (SD). Maternal age was compared between women with 1–2 and 3–8 striae using an independent-samples t-test. A two-sided P value <0.05 was considered statistically significant.

Comparison of Individual and Clinical Characteristics According to Striae Count

Among pregnant women in the aloe vera gel group, the mean body mass index (BMI) was higher in women with 1–2 striae than in those with 3–8 striae (23.56 ± 1.08 vs. 22.95 ± 1.32 kg/m², respectively). An independent-samples *t*-test demonstrated a statistically significant difference in BMI between the two groups (t = 2.057, df = 70, P = 0.043) (Table 7).

Variable	Striae count	N	mean ± SD	t	df	P-value
BMI (kg/m²)	1–2	51	23.56 ± 1.08	2.057	70	0.043
	3–8	21	22.95 ± 1.32			

Table 7. Comparison of Body Mass Index According to Striae Count Among Pregnant Women Receiving Aloe Vera Gel. Values are presented as mean ± standard deviation (SD). BMI was compared between women with 1–2 and 3–8 striae using an independent-samples *t*-test. A two-sided *P* value <0.05 was considered statistically significant.

Comparison of Age and Body Mass Index Across Itching-Frequency Groups

A one-way analysis of variance (ANOVA) was used to compare age and body mass index (BMI) across the three groups defined by daily itching frequency (1–2, 3–4, and 5–6 episodes/day). A statistically significant difference was observed in mean age across the three groups (F(2, 69) = 3.493, P = 0.036). Mean age was 29.60 ± 3.76 years in women reporting 1–2 episodes of itching per day, 28.94 ± 3.65 years in those reporting 3–4 episodes/day, and 26.10 ± 4.06 years in those reporting 5–6 episodes/day. Tukey's post-hoc test showed a significant difference between the 1–2 and 5–6 episodes/day groups, with women in the 1–2 episodes/day group having a higher mean age. In contrast, BMI did not differ significantly across the itching-frequency groups (F(2, 69) = 0.186, P = 0.830). The mean BMI was 23.32 ± 1.10 kg/m², 23.52 ± 1.30 kg/m², and 23.40 ± 1.34 kg/m² in the 1–2, 3–4, and 5–6 episodes/day groups, respectively. Thus, BMI did not differ significantly across the daily itching-frequency groups among pregnant women receiving Aloe vera gel (Table 8).

Comparison of Age and Body Mass Index Across Erythema Severity Groups

One-way analysis of variance (ANOVA) was used to compare mean age and body mass index (BMI) across the four erythema severity groups. No statistically significant difference was observed in mean age across the groups (F(3, 68) = 0.362, P = 0.780). Mean age was 28.38 ± 4.52 years among women without erythema, 29.78 ± 3.57 years among those with light red/pink erythema, 28.82 ± 3.69 years among those with red erythema, and 29.05 ± 3.79 years among those with purple erythema. Similarly, no statistically significant difference was observed in mean BMI across the erythema severity groups (F(3, 68) = 0.477, P = 0.699). Mean BMI was 23.38 ± 1.28 kg/m², 23.71 ± 1.48 kg/m², 23.23 ± 1.03 kg/m², and 23.30 ± 0.97 kg/m² in the no-erythema, light red/pink, red, and purple erythema groups, respectively. Overall, neither age nor BMI differed significantly across the erythema severity groups among pregnant women receiving Aloe vera gel (Table 9).

Discussion

The present study found significant between-group differences in the distribution of striae counts and daily itching frequency at the end of the intervention period. Participants in the Aloe vera group were more likely to have 1–2 striae and to report lower daily itching frequency than those in the placebo group. In contrast, erythema severity did not differ significantly between groups. Among participants assigned to Aloe vera, BMI differed between striae-count categories, while maternal age did not.

Variable	Itching frequency (times/day)	N	Mean	SD	F	df	P value*
Age (years)	1–2	43	29.60	3.76	3.493	2	**0.036**
	3–4	19	28.94	3.65			
	5–6	10	26.10	4.06			
	Total	**72**	**28.94**	**3.90**			
BMI (kg/m²)	1–2	43	23.32	1.10	0.186	2	**0.830**
	3–4	19	23.52	1.30			
	5–6	10	23.40	1.34			
	Total	**72**	**23.38**	**1.18**			

Table 8. Comparison of Age and Body Mass Index Across Groups Defined by Daily Itching Frequency Among Pregnant Women Receiving Aloe Vera Gel. Data are presented as mean ± standard deviation (SD). Differences in age and BMI across the three itching-frequency groups were assessed using one-way analysis of variance (ANOVA). For age, Tukey's post-hoc test was used for pairwise comparisons following a significant omnibus ANOVA. *P < 0.05 was considered statistically significant.

Variable	Erythema severity	N	Mean	SD	F	df	P value*
Age (years)	No erythema	21	28.38	4.52	0.362	3	0.780
	Light red/pink erythema	14	29.78	3.57			
	Red erythema	17	28.82	3.69			
	Purple erythema	20	29.05	3.79			
	Total	**72**	**28.94**	**3.90**			
BMI (kg/m²)	No erythema	21	23.38	1.28	0.477	3	0.699
	Light red/pink erythema	14	23.71	1.48			
	Red erythema	17	23.23	1.03			
	Purple erythema	20	23.30	0.97			
	Total	**72**	**23.38**	**1.18**			

Table 9. Comparison of Age and Body Mass Index Across Erythema Severity Groups Among Pregnant Women Receiving Aloe Vera Gel. Data are presented as mean ± standard deviation (SD). Differences in mean age and BMI across the four erythema severity groups were assessed using one-way analysis of variance (ANOVA). *P < 0.05 was considered statistically significant.

Maternal age also differed across itching-frequency categories, whereas BMI did not. Neither age nor BMI differed significantly across erythema severity categories. Abdominal circumference was greater in the Aloe vera group at both weeks 20 and 28; however, the baseline difference and the absence of an adjusted analysis limit interpretation of the week-28 comparison. Overall, the observed differences varied across the clinical outcomes assessed and should be interpreted in light of the study design and its limitations.

Pruritus and erythema are clinically relevant manifestations of striae gravidarum because they contribute to the local symptoms and visible skin changes associated with these lesions (13). Aloe vera has been investigated in topical skin preparations because of its potential effects on skin hydration and local inflammatory responses (14). However, the biological plausibility of these effects should be distinguished from demonstrated clinical efficacy in pregnancy-associated striae. In this context, Hajhashemi et al. reported that topical preparations containing

Aloe vera gel or sweet almond oil reduced itching and erythema and limited the spread of striae gravidarum compared with base cream and no treatment in a randomized clinical trial involving 160 nulliparous women. However, no significant differences in striae number or diameter were detected among the three cream groups (10). These findings suggest that the effects of topical preparations may differ across clinical outcomes, with improvements in symptoms or erythema not necessarily accompanied by measurable differences in lesion number or size. Ud-Din et al. reported that the evidence supporting topical preparations for striae distensae remains limited, with only a small number of studies evaluating their efficacy and inconsistent results across different formulations, highlighting the need for further well-designed randomized controlled trials (15). Also, Brennan et al. found no statistically significant overall reduction in the development or severity of striae gravidarum with topical preparations compared with placebo or no treatment, highlighting the limited evidence supporting their preventive efficacy (6). Evidence from other dermatological settings provides some support for the potential effects of topical Aloe vera on selected skin-related outcomes, although the findings are not uniformly positive. In a randomized, placebo-controlled study, Reuter et al. reported a reduction in UV-induced erythema following topical application of highly concentrated Aloe vera gel, while Fox et al. observed anti-erythema activity and an increase in skin hydration after a single application of Aloe vera-derived gel materials (16, 17). These findings provide biological context for investigating Aloe vera in conditions characterized by local skin changes, but they do not establish that the same effects occur in striae gravidarum. Clinical evidence also suggests that the response may vary according to the skin condition and the outcome assessed. In a randomized clinical trial involving patients with burn wounds, Mahboub et al. reported a significant reduction in itching following the application of Aloe vera gel, although the findings arose from a different clinical setting (18). Conversely, Heggie et al. found that topical Aloe vera gel did not significantly reduce radiation-induced skin side effects compared with aqueous cream, which was more effective in reducing dry desquamation and treatment-related pain (19). In the present study, the lower frequency of daily itching in the Aloe vera group and the between-group difference in striae categories should therefore be considered alongside the absence of a statistically significant difference in erythema severity. This outcome-specific pattern suggests that the observed findings were not consistent across all assessed skin manifestations. Moreover, because skin hydration, elasticity, and the subjective sensation of skin tightness were not directly measured, any contribution of these factors to the observed results remains hypothetical.

Limitations

Several limitations should be considered when interpreting these findings. First, the study was conducted at a single clinical center, which may limit the generalizability of the results to other populations and healthcare settings. Second, the intervention period was limited to 8 weeks, and longer follow-up was not performed to determine whether the observed differences in striae, pruritus, and erythema persist after treatment. Third, the assessment of striae, pruritus, and erythema was based on clinical scoring systems and therefore may be subject to some degree of observer or reporting variability, although

outcome assessment was performed by a blinded assessor. Fourth, the study evaluated a specific Aloe vera formulation and application regimen; therefore, the findings may not be directly applicable to other formulations, concentrations, or dosing schedules. Finally, the baseline difference in abdominal circumference between the study groups and the absence of an analysis adjusting for baseline values limit the interpretation of the week-28 comparison.

Conclusion

In this randomized, double-blind, placebo-controlled trial, topical Aloe vera use from gestational weeks 20 to 28 was associated with a more favorable distribution of striae counts and a lower reported frequency of daily itching than placebo. No statistically significant between-group difference was observed in erythema severity. These findings suggest a potential benefit of topical Aloe vera for selected clinical features of pregnancy-associated striae, but further well-designed trials with standardized outcome assessment and longer follow-up are needed to confirm its efficacy.

Implications for Patient Care

Topical Aloe vera gel may offer a simple, accessible option for pregnant women seeking to manage selected clinical features of striae gravidarum. In this trial, its use was associated with fewer striae and a lower reported frequency of daily itching compared with placebo, although no significant difference was observed in erythema severity. These findings may help inform discussions between healthcare professionals and pregnant women about topical skin care during pregnancy. However, Aloe vera should not yet be presented as an established preventive treatment for pregnancy-related striae. Further clinical trials are needed to confirm its benefits, assess longer-term outcomes, and establish its safety and tolerability during pregnancy.

Conflict of Interest

The authors declared no conflicts of interests.

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Ethics Statement

The authors confirm that all ethical principles of research and scientific publication, including plagiarism prevention, data integrity, and avoidance of duplicate publication, were fully observed.

Data Availability Statement

The datasets generated and/or analyzed during the current study are available from the corresponding author upon reasonable request.

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Author Contributions

SM and FY contributed to project administration and investigation. FE contributed to conceptualization and methodology. PB performed the statistical analysis. HN contributed to methodology and writing of the original draft. RA and PS contributed to the investigation. All authors reviewed and approved the final version of the manuscript.

Artificial Intelligence (AI) Disclosure

Artificial intelligence (AI) was used solely for language editing and improving the clarity and readability of the manuscript. The authors reviewed and approved the final text and take full responsibility for the accuracy and integrity of the manuscript.

Publisher's Note

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