



Research Article

Comparative Evaluation of the Efficacy of *Varun Twak Lepaguti* versus *Krushnatiladi Lepaguti* in *Vyanga* (Melasma): A Double-Blind Randomised Controlled Trial

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Abstract

Introduction: In the present era, beauty and skin health significantly influence self-confidence and quality of life. Melasma, a common hyperpigmentary disorder correlated with *Vyanga* in Ayurveda, affects mainly females and causes facial discoloration. Conventional treatments often produce side effects, prompting interest in safe Ayurvedic alternatives. **Aim and Objectives:** To evaluate and compare the efficacy of *Varun Twak Lepaguti* and *Krushnatiladi Lepaguti* in the management of *Vyanga* (melasma). **Material and Method:** A randomized double-blind clinical trial was conducted on 62 patients with *Vyanga*, divided equally into two groups. Group A received *Varun Twak Lepaguti* and Group B received *Krushnatiladi Lepaguti*, both applied locally with *Godugdha* once daily for 30 days. Assessments were made using subjective (discoloration, roughness, burning, itching, oiliness) and objective parameters (patch size, Von Luschan's scale, Melasma Severity Index). **Observation and Results:** Both groups showed statistically significant improvement in all parameters ($p < 0.0001$). However, Group B demonstrated greater improvement in discoloration, roughness, burning sensation, patch size, and MSI score, with highly significant intergroup differences ($p < 0.05$). **Conclusion:** *Krushnatiladi Lepaguti* proved more effective than *Varun Twak Lepaguti* in treating *Vyanga*, offering a safe, economical, and holistic Ayurvedic alternative for melasma management.

Keywords: Vyanga, Melasma, *Krushnatiladi Lepaguti*, *Varun Twak Lepaguti*, Hyperpigmentation.

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Introduction

The significance of beauty and personality is growing in contemporary society due to the competitive nature of the current era.(1) The necessity for beautiful and healthy skin is increasingly recognized each day. Any unhealthy physical condition is reflected in the skin, as beauty is demonstrated through complexion.(2) As a result of alterations in lifestyle and environmental conditions, dermatological issues have significantly increased. A person's beauty is largely evaluated based on the complexion and texture of their skin. The typical skin

color in humans is primarily attributed to the presence of melanin pigment.(3)

Melasma is a widely recognized acquired condition characterized by symmetric hyperpigmentation, most often seen on the face, with a higher prevalence in females and those with darker skin types. Several etiological factors, including light exposure, hormonal influences, and genetic background, have been implicated in the pathogenesis of this condition.(4) It accounts for 0.25 to 4% of patients observed in Dermatology Clinics across South East Asia, and it is the predominant pigment disorder among the Indian population.(5, 6) Moreover, although the condition predominantly affects females, males are also involved, with a female to male ratio of 4:1 in India. (7) The occurrence rate during pregnancy is approximately 50-70%.(8) Management of melasma involves the use of Hydroquinone, corticosteroids, tretinoin, azelaic acid, chemical peeling, and laser therapy. These treatments are effective; however, they may also induce adverse skin reactions such as irritation, erythema, cracking, post-

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inflammatory hyperpigmentation (PIH), and prolonged dyschromia. (9)

In the context of Ayurveda, melasma is correlated with *Vyanga*, which is classified under *kshudraroga* because of the similarity in their clinical presentations. This condition is characterized by *Niruja* (Painless), *Tanu* (thin), and *shyava varna mandalas* (bluish-black patches) on the face, which develop as a consequence of the vitiation of *vata* and *pitta dosha*, followed by *Rakta dushiti*. (10) In Ayurveda, different *Acharyas* have described several *chikitsa* for *Vyanga*. These include *Lepa*, *Abhyanga*, *Raktamokshan*, *Nasya*, *Virechan*, and *Shaman aushadhi*. *Lepa* is especially significant as it acts directly on the lesion, making it more effective. (11)

In Ayurvedic classics, for the treatment of the *Vyanga*, numerous drugs with *Vyangahara* properties are mentioned. The previous study was done on *Varun twak Lepa* titled as “Study on the Effect of *Varun Twak Lepa* in Management of *Vyanga*” by M. Swati, A. Vinod. Among these, *Varun Twak lepa* (12) as standard drug and *Krushnatiladi Lepa* (13) as interventional drug and its modified form as *Varun Twak Lepaguti* and *Krushnatiladi Lepaguti* was selected for the study as *Vyangahara* and *Kushthaghna dravyas*. This study aims to evaluate the effect of *Varun Twak Lepaguti* and *Krushnatiladi Lepaguti* in the management of *Vyanga*.

Melasma profoundly influences physical appearance, resulting in psychological distress, decreased self-confidence, and a deterioration in life quality. (14) Due to its rising prevalence and inadequate management, there is a necessity to identify herbal preparations to address this issue.

Primary Objectives

1. To evaluate the efficacy of *Varun Twak Lepaguti*.
2. To evaluate the efficacy of *Krushnatiladi Lepaguti*.
3. To compare the efficacy of *Varun Twak Lepaguti* and *Krushnatiladi Lepaguti* in *Vyanga*.

Materials and Methods

Source of Material

The Patients were randomly selected from Kayachikitsa and Prasuti Tantra and Streeroga OPD of Mahatma Gandhi Ayurved College, Hospital & Research center, Salod (H), Wardha with the features of *Vyanga* (Melasma).

Ethical Clearance

Before commencement of study, it was approved by Institutional Ethics Committee (reference no. MGACHRC/IEC/Sep – 2023/745 on dated 18 September 2023).

Study design : Randomized double blind standard control clinical trial (RCT)

Standard Drug : *Varun Twak Lepa guti*

Interventional Drug: *Krushnatiladi Lepa guti*

Inclusion Criteria

Patients between the age group of 18–50 years were selected for the study. Patients with a chronicity of less than 5 years were included. Patients presenting with clinical features of *Vyanga* as described in the Ayurvedic classics were also included. Pregnant and lactating women having *Vyanga* were included in the study.

Exclusion Criteria

Patients with a past or present history of any skin disease, such as psoriasis, dermatitis, vitiligo, or other dermatological conditions and hormonal imbalance were excluded from the study. Individuals suffering from any bacterial, fungal, or viral infection and those currently undergoing treatment with antibiotics, antifungal, or antiviral medications were excluded. Additionally, persons with large or dark scars on the face was not included in the study.

Withdrawal criteria

In the event that any undesirable side effects or complications arise during the study or treatment, the individual will be removed from the study and provided with treatment at no cost until recovery is achieved.

Randomization

Patients were randomly divided into the standard and interventional groups in a 1:1 ratio. The randomization process was carried out using computer-generated random number tables. Those assigned odd numbers received standard medicine, while those assigned even numbers were given interventional medicine.

Methodology

The patients were chosen using irrespective of their sex, religion and occupation. Prior to participating in the study, informed consent was acquired from each patient. A total of 62 patients were enrolled according to the inclusion criteria and randomly assigned to group A and group B using a lottery method.

- Group A - *Varun Twak Lepaguti* with *Godugdha* for local application once a day for 30 days.
- Group B - *Krushnatiladi Lepaguti* along with *Godugdha* for local application once a day for 30 days.

Method of Preparation of Drug

Ingredients of *Varun Twak Lepa guti* and *Krushnatiladi Lepa guti* are depicted in Table no. 1 and 2.

Table 1: Ingredients of Varun Twak Lepa guti

Sr. No.	Sanskrit Name	Latin Name	Part Used	Quantity
1	<i>Varun</i>	<i>Crataeva religiosa</i> Forst.	Stem bark	500 g
2	<i>Varun Twak Kwath</i>	-	-	Q.S. for Bhavana

Table 2: Ingredients of Krushnatiladi Lepa guti

Sr. No.	Sanskrit Name	Latin Name	Part Used	Quantity
1	<i>Krushna Tila</i>	<i>Sesamum indicum</i> Linn.	Seed	400 g
2	<i>Krushna Jeeraka</i>	<i>Carum carvi</i> Linn.	Seed	400 g
3	<i>Shweta Jeeraka</i>	<i>Cumin cyminum</i> Linn	Seed	400 g
4	<i>Shweta Sarshap</i>	<i>Brassica alba</i> Linn.	Seed	400 g
5	<i>Krushnatiladi Kwath</i>	-	-	Q.S. for Bhavana

The general method of *Vati/Varti Kalpana* was followed for preparing *Varun Twak Lepakuti* and *Krushnatiladi Lepakuti*. For *Varun Twak Lepakuti*, *Varun Twak Churna* was triturated with *Varun Twak Kwatha* for three hours. Similarly, equal quantities (100 g each) of the powdered ingredients of *Krushnatiladi Lepakuti* were mixed and triturated with *Krushnatiladi Kwatha* for three hours. Adequate *Kwatha* was added during trituration until a semi-solid mass was obtained. The mass was dried, powdered, and subjected to *Bhavana* three times. Finally, uniformly shaped *Lepakuti* were prepared using moulds and dried completely.

Gradation of Subjective Criteria

Table 3: Showing Gradation of Subjective Criteria (15)

Symptoms	Grade 0 (Normal)	Grade 1 (Mild)	Grade 2 (Moderate)	Grade 3 (Severe)
Shyavata (Discolouration)	No <i>Shyavata</i> (Discolouration)	Reddish Brown Colour	Brown colour	Blackish Brown colour
Parush Sparsh (Dryness)	Normal	Not seen but felt by touch	Stretching of skin that person feels	Visible dryness, Chapping and hardness of the skin
Daha (Burning Sensation)	No <i>Daha</i> (No Burning sensation)	Mild <i>Daha</i>	Moderate <i>Daha</i>	Severe <i>Daha</i>
Kandu (Itching)	No <i>Kandu</i> (No itching)	Occasionally itching (frequency & intensity mild)	Moderately itching (Either frequency or intensity more)	Severe itching
Snigdhatata (Oiliness)	Normal	Not seen but felt by touch, No need to wash face frequently (Only 1-2 times a day)	Oiliness is visible on skin, Need to wash face frequently (3-4 times a day)	Excessive oiliness is visible on skin, Formation of acne, Need to wash face frequently (>4 times a day)

Gradation of Objective Criteria

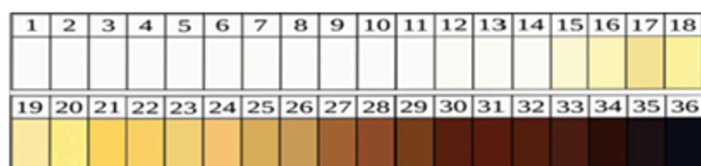
Size of Patches :

Table 4: Showing Gradation of Size of Patches

Grade	Size of Patches
0	0 – 1 cm
1	1.1 – 3 cm
2	3.1 – 6 cm
3	More than 6 cm

Von Luschan's color scale : (15)

The alteration in complexion was documented with a digital fusifilm camera during daylight on the 0th, 15th, and 30th day.



Melasma Severity Index (MSI) Score : (16)

Melasma Severity Index score formula

$$0.4(a \times P_2) + 0.4(a \times P_2) + 0.2(a \times P_2) \times n$$

"a" – area of involvement; "p" - severity of pigmentation; "l" - left side of face; "r" - right side of face; "n"-nose.

Method of Application

In group A, *Varun Twak Lepakuti* and in group B, *Krushnatiladi Lepakuti* were topically administered to the face in an upward direction with *godugdha* once each day for a duration 30 days. The *Lepakuti* was rubbed on a piece of stone with a small quantity of *godugdha* until a thick paste was prepared. This sufficient quantity of paste was applied to the affected area for 20 min. The face was cleansed with warm or lukewarm water once the *Lepakuti* has partially dried.

Assessment Criteria

The assessment of patient was evaluated on 0th, 15th and 30th day.

The area involved and severity of pigmentation is scored as follows

Table 5: Showing melasma severity assessment

Grade	Area Involvement (A)
0	<10% area involved
1	11-30% area involved
2	31-60% area involved
3	>60% area involved

Table 6: Showing severity of pigmentation

Grade	Pigmentation
0	No visible Pigmentation
1	Barely Visible pigmentation
2	Mild pigmentation
3	Moderate pigmentation
4	Severe pigmentation

Observations and Results

In this study, a total of 62 samples were included, with 31 samples treated with *Varun Twak Lepakuti* and 31 samples treated *Krushnatiladi Lepakuti*. The gathered data was transformed into a coded format and entered into a Microsoft Excel Worksheet. Statistical analysis was carried out based on descriptive and inferential statistics, utilizing the Wilcoxon signed-rank test

alongside the Mann-Whitney U Test'. The analysis was executed using SPSS version 17.

Table 7: Showing age wise distribution of patient

Category	Sub-category	Group B		Group A		Total	
		No. of Patient	%	No. of Patient	%	No. of Patient	%
Age wise Distribution	18-34	6	19.35	6	19.35	12	19.35
	35-50	25	80.65	25	80.65	50	80.65
	Total	31	100	31	100	62	100
Gender-wise Distribution	Male	7	22.58	1	3.226	8	12.9
	Female	24	77.42	30	96.77	64	103.2
	Total	31	100	31	100	62	100

The 62 patients were divided into two age groups: 18–34 years (6 patients, 19.35%) and 35–50 years (25 patients, 80.65%), with most aged 35–50 years. The similar age distribution across both groups allows for a fair comparison of treatments without age-related bias. Overall, 8 patients (12.9%) were male and 54 (87.1%) were female; Group A included 1 male (3.23%) and 30

females (96.77%), while Group B had 7 males (22.58%) and 24 females (77.42%). The predominance of female participants, especially in Group A, suggests the condition may be more common in females or that more females opted to participate in the study.

Table 8: Showing sun exposer and cosmetic use wise distribution of patient

Factor	Sun exposure	Group B		Group A		Total	
		No. of Patient	%	No. of Patient	%	No. of Patient	%
Sun Exposure	Yes	21	67.74	23	74.19	44	70.96
	No	9	29.03	8	25.81	17	27.71
	Total	31	100	31	100	62	100
Cosmetic Use	Yes	20	64.52	26	83.87	46	74.19
	No	11	35.48	5	16.13	16	25.81
	Total	31	100	31	100	62	100

Among the 62 patients, 44 (70.96 %) had regular sun exposure and 17 (27.71%) did not, indicating that most participants regularly received sunlight, which may affect their health or skin condition. Similarly, 46 patients (74.19%) used cosmetics and 16 (25.81%) did not, with higher cosmetic use in Group A (83.87%) compared to Group B (64.52%), suggesting that regular cosmetic use may also be relevant to the condition studied.

Table 9: Showing Wilcoxon signed ranked test for subjective criteria in both B and A group

Parameter	Group	BT/AT	N	Mean	Median	W	P
<i>Shyavata</i>	B	BT	31	2.290	2	490	< 0.0001
		AT	31	0.225	0		
	A	BT	31	2.483	3	486	< 0.0001
		AT	31	0.548	1		
<i>Parush Sparsha</i>	B	BT	31	2.322	2	496	< 0.0001
		AT	31	0.2558	0		
	A	BT	31	1.967	2	479	< 0.0001
		AT	31	0.548	1		
<i>Daha</i>	B	BT	31	1.838	2	465	< 0.0001
		AT	31	0.193	0		
	A	BT	31	1.741	2	496	< 0.0001
		AT	31	0.516	1		
<i>Kandu</i>	B	BT	31	1.903	2	482	< 0.0001
		AT	31	0.193	0		
	A	BT	31	1.451	1	496	< 0.0001
		AT	31	0.258	0		
<i>Snigdhatta</i>	B	BT	31	0.000	0	300	< 0.0001
		AT	31	0.774	1		
	A	BT	31	0.7096	1	153	0.000168
		AT	31	0.000	0		

The Wilcoxon Signed Rank Test results illustrated in Table no. 6 show a highly significant improvement ($p < 0.0001$) in all subjective parameters in both Group A and Group B after treatment. Mean and median scores for *Shyavata*, *Parush Sparsha*, *Daha*, and *Kandu* decreased notably in both groups, indicating substantial symptom relief. However, the improvement was more pronounced in Group B, suggesting greater treatment efficacy of Group B.

For *Snigdhatta*, Group B showed a significant increase from 0.000 to 0.774 ($p < 0.0001$), reflecting enhanced skin moisture a favorable outcome while Group A showed a decrease from 0.7096 to 0.000 ($p = 0.000168$), indicating a less desirable effect. Overall, both interventions were effective, but Group B demonstrated superior therapeutic benefits across all parameters, supported by highly significant p-values, confirming that the observed improvements are statistically meaningful and not due to chance.

Table 10: Showing Man Whitney U Test' for comparison between subjective criteria of both the groups

Parameter	Group	N	Mean	Sum of Ranks	U	P
<i>Shyavata</i>	Group B	31	0.225	1131.5	325.5	0.0099
	Group A	31	0.548	821.5		
<i>Parush Sparsha</i>	Group B	31	0.255	1116	341	0.0212
	Group A	31	0.548	837		
<i>Daha</i>	Group B	31	0.193	1131.5	325	0.028
	Group A	31	0.516	821.5		
<i>Kandu</i>	Group B	31	0.193	1007.5	449.5	0.6646
	Group A	31	0.258	945.5		
<i>Snigdhatta</i>	Group B	31	0.774	604.5	108.5	<0.0001
	Group A	31	0	1348.5		

The Mann–Whitney U Test results show significant differences between Groups A and B before and after treatment. *Shyavata*, *Parush Sparsha*, and *Daha* showed greater improvement in Group B, with p-values of 0.0099, 0.0212, and 0.028 respectively, indicating superior efficacy. *Kandu* improved similarly in both groups ($p = 0.6646$), showing no significant difference. A highly significant difference was noted in *Snigdhatta* ($p < 0.0001$), where Group B showed a marked increase (mean = 0.774) compared to Group A (mean = 0.000). Overall, Group B demonstrated significantly better outcomes across most subjective parameters.

Table 11: Showing Wilcoxon signed ranked test for objective criteria in both B and A group

Parameter	Group	Time	N	Mean	Median	W	P
Size of Patch	B	BT	31	2.096	2	496	< 0.0001
		AT	31	0.322	0		
	A	BT	31	2.032	2	406	< 0.0001
		AT	31	0.870	1		
Von Luschan's Color Scale	B	BT	31	26.225	26	482	< 0.0001
		AT	31	19.516	19		
	A	BT	31	26.935	27	473	< 0.0001
		AT	31	20.483	20		
MSI Score	B	BT	31	14.390	14.8	491	< 0.0001
		AT	31	5.677	5.6		
	A	BT	31	7.580	7.2	469	< 0.0001
		AT	31	3.038	7.6		

The results of the Wilcoxon Signed Rank Test demonstrated in Table no. 8 show a statistically highly significant improvement ($p < 0.0001$) in all objective parameters after treatment in both Group A and Group B. In the *Size of Patch*, the mean value markedly decreased from 2.096 to 0.322 in Group B and from 2.032 to 0.870 in Group A, indicating a greater reduction in lesion size in Group B. The *Von Luschan's Color Scale* also showed a significant decrease in both groups, from 26.225 to 19.516 in Group B and from 26.935 to 20.483 in Group A, reflecting notable repigmentation, with Group B showing slightly better improvement. Similarly, the *MSI Score* reduced significantly post-treatment in both groups from 14.390 to 5.677 in Group B and from 7.580 to 3.038 in Group A demonstrating overall clinical improvement. Thus, both treatments were effective, but Group B exhibited superior improvement across all objective parameters.

Table 12: Showing Man Whitney U Test' for comparison between objective criteria of both the groups

Objective Parameter	Group	N	Mean	Sum of Ranks	U	P
Size of Patch	Group B	31	0.322	1240	217	0.000137
	Group A	31	0.870	713		
Von Luschan's Color Scale	Group B	31	19.516	1120.5	336.5	0.0409
	Group A	31	20.483	832.5		
MSI Score	Group B	31	5.677	685.5	189.5	<0.0001
	Group A	31	3.038	1267.5		

Table compares the objective outcomes of Group B (Trial) and Group A (Control) before and after treatment using the Mann–Whitney U test. Both groups showed improvement in melasma following treatment, with Group B demonstrating greater improvement in patch size and skin colour. After treatment, Group B had a lower mean patch-size score (0.322) than Group A (0.870), with a highly significant difference ($U = 217$, $p =$

0.000137). Similarly, the Von Luschan's Colour Scale score was lower in Group B (19.516) than Group A (20.483), showing a significant difference ($U = 336.5$, $p = 0.0409$). Although Group A showed a lower post-treatment MSI score (3.038 vs. 5.677), the overall findings indicate that Group B produced greater improvement in the objective parameters of melasma after treatment compared with Group A.

Discussion

The present randomized, double-blind comparative clinical study evaluated the efficacy of *Varun Twak Lepaguti* (Group A) and *Krushnatiladi Lepaguti* (Group B) in the management of *Vyanga* (melasma). 62 patients were enrolled, with 31 patients in each group. Both formulations were applied locally with *Godugdha* once daily for 30 days. Both groups demonstrated statistically highly significant improvement in almost all subjective and objective parameters, confirming their therapeutic potential in *Vyanga*. However, intergroup analysis indicated greater overall improvement with *Krushnatiladi Lepaguti* in several parameters.

The demographic profile showed a marked female predominance (87.1%), with most patients belonging to the 35–50-year age group (80.65%). This pattern is consistent with the established epidemiology of melasma and findings from previous Ayurvedic studies. (17) Furthermore, 70.96% of patients reported regular sun exposure and 74.19% used cosmetics. These factors may contribute to the development and persistence of melasma, particularly through ultraviolet exposure and environmental influences. (18)

Both groups showed highly significant improvement in *Shyavata*, *Parush Sparsha*, *Daha*, and *Kandu* ($p < 0.0001$). The reduction in *Shyavata* indicates improvement in facial hyperpigmentation, which is the principal clinical manifestation of *Vyanga*. The intergroup comparison further demonstrated significantly better improvement with Group B for *Shyavata* ($p = 0.0099$), *Parush Sparsha* ($p = 0.0212$), and *Daha* ($p = 0.028$). These findings suggest that *Krushnatiladi Lepaguti* may have a stronger local effect on pigmentation and associated skin abnormalities. (19) Similar improvement in pigmentation has been reported in earlier Ayurvedic clinical studies. Pallavi et al. found significant improvement in MSI and observed that the effect of *Varnya Gana Lepa* was particularly evident for darkness. (20) Likewise, Mundhe and Ade reported significant improvement in MSI following *Varun Twak Lepa*, particularly in epidermal melasma. (16)

A notable difference was observed in *Snigdghata*. Group B showed improvement in mean score from 0 to 0.774, whereas Group A decreased from 0.7096 to 0. The intergroup difference was highly significant ($p < 0.0001$), suggesting better maintenance of skin moisture and texture with *Krushnatiladi Lepaguti*. The use of *Godugdha* as the application medium may also have contributed to this effect. (21)

Objective parameters supported these findings. Patch size decreased significantly in both groups ($p < 0.0001$), with greater reduction in Group B (2.096 to 0.322) than Group A (2.032 to 0.870), with a highly significant intergroup difference ($p = 0.000137$). Von Luschan's colour scale also improved significantly, with greater reduction in Group B (26.225 to 19.516) than Group A (26.935 to 20.483; $p = 0.0409$). These results are consistent with previous studies demonstrating beneficial effects of Ayurvedic topical preparations in *Vyanga*. (22)

MSI scores decreased significantly in both groups. Although post-treatment scores differed significantly ($p < 0.0001$), baseline MSI values were substantially different, making direct comparison of post-treatment means less reliable. Change-from-baseline or adjusted between-group analysis would therefore provide a more robust comparison. Overall, both formulations were effective, while *Krushnatiladi Lepaguti* demonstrated superior improvement in several clinical and objective parameters. (23)

The probable efficacy of *Krushnatiladi Lepaguti* may be explained through the Ayurvedic properties of its constituent drugs. *Krushna Tila*, *Krushna Jeeraka*, *Shweta Jeeraka*, and *Shweta Sarshapa* possess properties that may support *Rakta Prasadana*, *Twak Prasadana*, and correction of local *Dosha* imbalance. As *Vyanga* is described in relation to vitiation of *Vata-Pitta* and *Rakta*, drugs acting upon *Rakta* and *Twak* may help restore normal complexion. The preparation as *Lepaguti* may additionally ensure uniform application and prolonged local contact compared with a conventional powder formulation. (24)

The findings of the present study are also consistent with the broader Ayurvedic approach that emphasizes *Bahi Parimarjana Chikitsa* for localized skin disorders. Previous research has demonstrated that topical therapy can be effective in *Vyanga*. In the study by Angadi et al., topical *Arjunatwak Lepa* produced clinically meaningful improvement, while its combination with internal *Panchanimba Churna* produced still greater benefit, suggesting the potential value of both local and systemic approaches. (25) Similarly, the earlier *Varun Twak Lepa* study demonstrated significant improvement in MSI over 20 and 30 days, supporting the present observation that *Varun Twak*-based topical treatment can reduce melasma severity. (16)

Thus, the present study indicates that both *Varun Twak Lepaguti* and *Krushnatiladi Lepaguti* are useful topical interventions for *Vyanga*. The statistically significant improvements observed in both groups support their therapeutic potential, while the intergroup findings suggest comparatively greater benefit with *Krushnatiladi Lepaguti* in most subjective and objective parameters. However, the unequal baseline MSI values, relatively small sample size, short 30-day treatment period, and absence of long-term follow-up should be considered while interpreting the findings. Larger randomized controlled studies with longer follow-up, standardized photographic assessment, and analysis adjusted for baseline severity and melasma subtype are warranted to establish the comparative efficacy and durability of these formulations.

Conclusion

The clinical study demonstrates that both *Varun Twak Lepaguti* and *Krushnatiladi Lepaguti* effectively manage *Vyanga* (melasma), improving symptoms like discoloration, roughness, burning, itching, and skin texture. However, *Krushnatiladi Lepaguti* showed superior efficacy, significantly reducing pigmentation, patch size, and Melasma Severity Index, while enhancing skin smoothness and tone. Its pharmacological actions like blood purification, skin nourishment, and pigmentation correction address underlying *Vata*, *Pitta*, and *Rakta* imbalances. Safe, economical, and holistic, *Krushnatiladi Lepaguti* offers a reliable Ayurvedic alternative for melasma, merging traditional wisdom with modern dermatological outcomes.

Fig 1: Before Treatment Fig 2: After Treatment



Fig 3: Before Treatment



Fig 4: After Treatment



Fig 5: Before Treatment



Fig 6: After Treatment



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