



Research Article

Revitalizing The Scalp: Evaluating Bhringaraja Oil Head Massage In Darunaka (Dandruff) Through A Clinical Lens

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Abstract

Background: *Darunaka* (dandruff) is a common and persistent scalp condition characterized by scalp scaling and visible flakes, often accompanied by itching and irritation that impacts the individual's physical and psychological well-being. Current global prevalence reports indicate that 50% of the population struggles with dandruff. It is a condition that has persisted for centuries, and although several therapeutic options such as synthetic compounds are available, they often result in scalp dryness, burning and hair discoloration. Bhringaraja oil is a polyherbal Ayurvedic formulation specifically mentioned for treating *Darunaka* (dandruff). Aim: To evaluate the efficacy of Bhringaraja oil therapeutic head massage in managing Dandruff. Methods: A single-arm clinical trial was conducted in 49 patients suffering from dandruff. The study received IEC approval (DYPCARC/IEC/512) and was registered with CTRI (CTRI/2023/03/050628). Patients were administered a therapeutic head massage for 20 minutes with the Bhringaraja oil for 7 consecutive days. A follow-up assessment was performed on the 14th day. Subjective parameters such as itching, hair fall, dryness, and scalp scaling were graded, and the ASFS (Adherent scalp flaking score) scale was used for objective evaluation. The data were examined using SPSS version 16.0. Results – A total of 49 patients were included in this analysis. Follow-up data revealed a significant reduction in Subjective parameters and ASFS scores. The scores reduced from 3 to 1.47 ($p < 0.05$) on the 7th day and further declined to 1.43 ($p < 0.05$) on the 14th day of follow-up. Conclusion: Bhringaraja oil massage exhibited significant therapeutic efficacy in the treatment of dandruff.

Keywords: *Dandruff, Ayurveda, Bhringaraja oil, Herbal hair oil, Eclipta alba (L) hassk, Traditional medicine.*

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Introduction

Dandruff, also referred to as Pityriasis capitis is commonly confined to the scalp which has persisted over the ages despite the availability of various therapeutic measures. Dandruff affects nearly 50% of the adult population (1), manifesting as white flakes and itching, and can progress to seborrheic dermatitis

(inflammatory condition of the scalp) and loss of hair(2). Individuals suffering from dandruff may experience varying degrees of severity and are subjected to low self-regard and confidence due to visible scalp flaking and itching. As per modern science, *Malassezia furfur*, a type of fungus, is identified as a pathogen of dandruff(3)(4). Individuals with dandruff are likely to experience hair loss that is twice as high compared to those with non-dandruff scalps. However, a positive correlation with the clinical grades of dandruff cannot be established (5)

In Ayurveda, Dandruff is correlated to *Darunaka*, as described in *Kshudrarogadhikaar* (a group of minor diseases)(6) as well as in *Shiroroga* (diseases of the head)(7). *Darunaka* is primarily considered a *Vata-Kaphaja* disorder affecting the scalp. Various treatment approaches like *Shiroabhyanga* (head massage), *Lepa*

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(herbal paste application), *Shirobasti* (oil retention on the head), and *Shiropakshalana* (cleansing), *Nasya* (nasal instillation) are recommended for treatment of *Darunaka* (8).

Shiroabhyanga is a Panchakarma therapy under *Snehana* (oleation therapy), involving the application of herbal oils with *Vata* pacifying properties to the scalp through therapeutic massage. It is primarily indicated for conditions like *Roukshya* (dryness), *Kandu* (itching), and *Mala* (scaliness), which are characteristics commonly associated with dandruff (9).

The Current synthetic anti-dandruff agents contain antifungal (zinc pyrithione and imidazoles), keratolytic (tar, selenium sulfide, salicylic acid, and sulfur compounds), anti-inflammatory (corticosteroids), anti-sebum (isotretinoin and cyproterone acetate), and antibacterial agents (pimecrolimus and tacrolimus) often cause side effects and lack lasting effectiveness, creating a need for alternative therapies with better results and fewer side effects, especially in the pharmaceutical and cosmetic fields (10).

Bhringaraja oil is a formulation mentioned in Ayurveda specifically for *Darunaka*, prepared by using a base of *Tila taila* (sesame oil) and enriched with herbs like *Bhringaraja* (*Eclipta alba* (L) *hassk.*, *Triphala* (A blend of powder of *Haritaki*, *Terminalia chebula* Retz; *Bibhitaki*, *Terminalia bellirica* Roxb; and *Amalaki*, *Embllica Officinalis* Gaertn), *Sariva* (*Hemidesmus indicus* L), and *Mandoor* (Iron oxide) (11).

Therefore, the clinical study has been conducted to evaluate the efficacy of Bhringaraja oil head massage in managing Dandruff.

Objective

To study the effect of Bhringaraja oil head massage in the management of *Darunaka* (Dandruff) by using the ASFS scale.

Materials and methodology

Ethics Statement

The study was approved by the Institutional Ethics Committee of Dr. D. Y. Patil Vidyapeeth, Pune (Approval No. DYPCARC/IEC/512, dated 05/08/2022) and registered with CTRI (CTRI/2023/03/050628, dated 13/03/2023). Written informed consent was obtained from all participants.

Study Framework and Setting

A single-arm clinical trial was conducted to evaluate the efficacy of Bhringaraja oil massage in treating dandruff patients at Dr. D. Y. Patil Ayurved Hospital, Pimpri, Pune.

Preparation of Bhringaraja oil

Drug authentication and standardization

The taxonomic identification of *Eclipta alba* was conducted at the Botanical Survey of India, Western Regional Centre, 7-Koregaon Road, Pune-411001. (Ref No. BSI/WRC/100-1/Tech./2023/).

Authentication and standardization of *Triphala*, *Sariva*, *Mandoor*, Sesame oil, and the final product were carried out at Sudhatatva Pharmacy, which formulates FDA-approved and GMP-certified products.

Preparation of Bhringaraja oil

Bhringaraja oil was prepared at Sudhatatva Pharmacy following the SOP (Standard Operative Procedure) outlined in the Ayurvedic Textbook(12). The oil was formulated using *Bhringaraja* (*Eclipta alba* (L) *hassk.*, *Triphala* (A blend of powder of *Haritaki*, *Terminalia chebula* Retz; *Bibhitaki*, *Terminalia bellirica* Roxb; and

Amalaki, *Embllica Officinalis* Gaertn), *Sariva* (*Hemidesmus indicus* L), and *Mandoor* (Iron oxide).

Enrollment details

The Sample size was calculated with a prevalence rate of 50%(1) A total number of patients required was 49. A purposive sampling method was utilized.

Inclusion Criteria

Participants exhibiting symptoms of dandruff(13) such as itching, hair fall, scaling of scalp skin, and scalp dryness, were enrolled regardless of age, gender, religion, and occupation.

Exclusion Criteria

The exclusion criteria were Patients with other scalp conditions such as psoriasis, eczema, or ringworm infection and Patients experiencing severe hair loss, like in cases of alopecia.

Intervention

The oil is first made lukewarm and then applied to the patient's scalp, followed by a massage for 20 minutes for 7 consecutive days.

After the procedure, patients were asked to rest on the chair for 15 minutes and then allowed to take a head bath with lukewarm water thrice a week.

Parameters for assessment

Subjective Parameter

Table No. 1 Subjective parameter		
Parameters	Findings	Grading
Itching	No itching	0
	Occasionally (on non-consecutive days)	1
	Frequently (1-3 times per day)	2
	Constantly (> 3 times per day)	3
Falling of hair	No noticeable hair fall during combing, washing	0
	Hair fall is noticed only during combing or washing	1
	Moderate loss (Hair fall noticed during combing, washing and on pillow/cloths)	2
	Maximum loss (Excessive hair loss with visible thinning of hair and widening of parting)	3
Scaling of scalp skin	No visible scales on scalp	0
	Mild (Visible only parting of hair)	1
	Moderate (clearly visible over hair)	2
	Severe (Adherent scales extending beyond scalp to forehead, neck and shoulder)	3
Dryness	No Dryness	0
	Negligible (Slight roughness without tightness or discomfort)	1
	Moderate (Persistent dryness with tightness and mild discomfort on scalp)	2
	Severe (Dryness with cracking skin associated with pain and discomfort)	3

Improvement in the patients was evaluated based on the relief in signs and symptoms of the disease. To measure the therapeutic effect, each symptom was assigned a score according to its severity.

Objective parameter: The ASFS scale was used as an objective parameter (14).

Table 2: Objective parameter Scaling scores

Severity of Scaling	Score
No scaling	0
Slight scaling	2
Some scaling	4
Moderate scaling	6
Heavy scaling	8
Very heavy scaling	10

The Adherent Scalp Flaking Score (ASFS) was measured by dividing each participant's scalp into eight regions. Each section was evaluated for dandruff flakes sticking to the scalp, using a scale from 0 to 10, where 0 indicates no flakes and 10 represents severe flaking. The score breakdown is shown in [Table No. 2].

Table 2.1: Objective parameter score Grading

Severity	Score	Grade
No Scaling	0	0
Mild	16-24	1
Moderate	25-34	2
Severe	35-80	3

The total score ranges from 0 to 80. For classification purposes, the subject's score was grouped into the categories shown in [Table No.2.1].

Statistical Analysis

The data obtained from the observations were analysed statistically. SPSS 16.0 was employed for statistical analysis.

Table No. 3. Results of Before and after results of Subjective

Itching	N	Test statistic	P value
Negative Ranks	49	-6.246	<0.001
Positive Ranks	0		
Ties	0		
Total	49		
Hair fall	N	Test statistic	P value
Negative Ranks	49	-6.872	<0.001
Positive Ranks	0		
Ties	0		
Total	49		
Dryness	N	Test statistic	P value
Negative Ranks	49	-6.275	<0.001
Positive Ranks	0		
Ties	0		
Total	49		
Scaling	N	Test statistic	P value
Negative Ranks	49	-5.429	<0.001
Positive Ranks	0		
Ties	0		
Total	49		
Results of Before and after results of the ASFS Scale by Wilcoxon			
Scaling ASFS Scale	N	Test statistic	P value
Negative Ranks	49	-6.448	<0.001
Positive Ranks	0		
Ties	0		
Total	49		

Observations and Results

The Wilcoxon signed-rank test was used to compare before and after results, while the Friedman test was applied for evaluating treatment outcomes across follow-ups. A p-value of less than 0.05 was regarded statistically significant.

Result of before and after treatment of subjective parameters by Wilcoxon signed-rank test

As p value < 0.05, there is a significant difference in grades of subjective parameters and ASFS Scale after treatment. A negative rank indicates it reduces after treatment. Ties indicate it remains the same. As in all patients it gets reduced, and treatment is effective in reducing symptoms of dandruff [Table No.3].

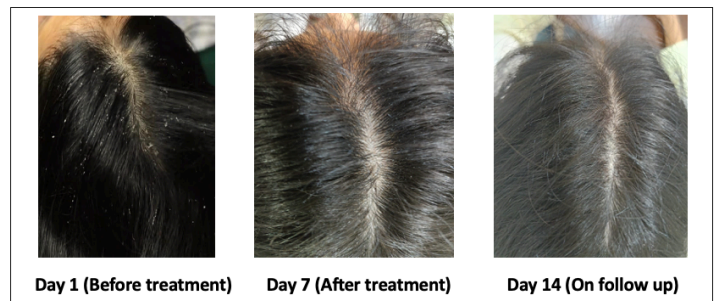
Follow up wise result of the subjective parameter by Friedman test

Table No. 4. Follow-up wise Results of Subjective parameter by Friedman test

Effect of therapy on Itching				
Mean ranks			t	P
Day 1	Day 7	Day 14	95.916	<0.001
3	1.54	1.46		
Effect of therapy on Hair fall				
Mean ranks			T	P
Day 1	Day 7	Day 14	98.00	<0.001
3	1.50	1.50		
Effect of therapy on Dryness				
Mean ranks			T	P
Day 1	Day 7	Day 14	96.160	<0.001
3	1.53	1.44		
Effect of therapy on Scaling				
Mean ranks			T	P
Day 1	Day 7	Day 14	94.185	<0.001
3	1.57	1.43		
Follow-up wise Results of ASFS Scale by Friedman test				
Mean ranks			T	P
Day 1	Day 7	Day 14	94.182	<0.001
3	1.47	1.43		

As p value < 0.05, there is a significant difference in grades of Subjective parameters and ASFS Scale during each follow-up. It decreased significantly after treatment and in the next follow-up also. The reduction in mean ranks indicates that the treatment is effective [Table No. 4].

Figure 1: An image showing Before and After Results



Discussion

The statistical analysis of the present study demonstrated a p-value < 0.05 revealing Bhringaraja Oil head massage effectively

reduces itching, hair fall, dryness of scalp and scaling. The reduction in ASFS scores during each assessment demonstrates the efficacy of this therapy in the treatment of dandruff. Clinically, 72% of patients achieved moderate improvement, while 14% with marked and 14% with mild improvement. There was no patient with no improvement.

The results of the present study are consistent with previous clinical studies evaluating oil-based therapies in *Darunaka*. A prior study (A comparative clinical study to evaluate the efficacy of *Malatyadi Taila Shiro Abhyanga* over *Dhurdhuradi Taila Shiro Abhyanga* in the management of *Darunaka* (Dandruff) by Manasa Panchaxarimath and Sanjay M Kadlimatti) found that *shiroabhyanga* with Ayurvedic oil provided relief from itching, dry scalp, and hair fall. (15) Although direct numerical comparison is limited due to differences in outcome grading.

Dandruff is a milder form of Seborrheic dermatitis, which is an inflammatory condition of the scalp. Both microbial and non-microbial factors can trigger dandruff. Among the various known causes, it may result from either a single factor or a combination of multiple causes. (16) According to Ayurveda, the pathophysiology of dandruff involves the vitiation of both *Vata* and *Kapha doshas*. The vitiation of *Kapha dosha* causes itching while, the vitiation of *Vata dosha*, characterized by its *Ruksha guna* (dryness), leads to symptoms such as hair fall, dryness and scaling.

In this study, Bhringaraja oil was used. The ingredients of Bhringaraja oil include *Bhringaraja*, *Triphala*, *Sariva*, and *Mandoor*, prepared in a base of sesame oil, with *Bhringaraja* as the primary ingredient. *Bhringaraja* pacifies *Vata & Kapha* dosha due to its *Katu* (pungent) taste, *Tikshna* (sharp) qualities, and *Ushna* (hot) potency (17). It is regarded as *Krimihara* (antihelminthic), (17) and *Sariva* as *Kanduhara* (itch-relieving), (18) Together, they address the pathophysiology of *Darunaka* by alleviating the vitiated *Vata* and *Kapha* doshas (19).

Eclipta alba (L.) Hassk. is rich in phytochemicals such as alkaloids, flavonoids, saponins, and glycosides, which contribute to its pharmacological activities, including antifungal activity against *Malassezia*, a common cause of dandruff (20) (21).

All the drugs used in Bhringaraja oil possess antimicrobial and anti-inflammatory properties. The combined antimicrobial and anti-inflammatory effects of *Bhringaraja*, (22) *Triphala* (23) (24) *Sariva*, (25) and *Mandoor* (26) help to alleviate inflammation and thereby itching.

The organism *Malassezia* has been identified as a contributor to oxidative damage (27) Oxidative stress plays a role in early hair loss, as hair on the scalp appears to be affected before it emerges. Thus, Bhringaraja oil with antioxidant properties can reduce the population of *Malassezia* to decrease premature hair loss. *Bhringaraja*, being a *Keshya* (hair tonic) with antioxidant properties, supports hair health and stimulates hair growth (22) *Triphala*, *Sariva*, and *Mandoor* also possess antioxidant properties, further contributing to the overall scalp and hair health (19) Hair fall is mainly due to the aggravation of *Vata dosha* as per Ayurveda. Bhringaraja oil, with its *Snigdha guna* (unctuous quality), pacifies the aggravated *Vata dosha*, thereby helps to reduce hair fall.

Dryness is primarily attributed to vitiation in *Vata dosha* (28) Head massage with Bhringaraja oil reduces dryness because *Snehana* (oleation therapy) pacifies *Vata dosha* softens the skin tissue and removes obstruction of *Mala* (toxins) (29) Thus, it helps to provide lubrication and moisture to the scalp, which

ultimately prevent the formation of dry flakes and scales associated with dandruff.

Sesame oil is used as a base of Bhringaraja oil that offers several benefits, including anti-inflammatory properties due to the lignans it contains. Its antioxidant effect is notable, as the presence of sesamol and sesaminol makes it resistant to oxidative deterioration, with significant in vivo activity observed (30) Studies have shown that a combination of tocopherol, tocotrienol, and sesamin extract can reduce UV-induced damage and protect the hair by forming a protective coat (31). Additionally, sesame oil has strong antibacterial properties. The oil also acts as a moisturizing agent, hydrating the hair follicle and preventing dryness due to its enhanced penetration capacity (31).

Head massage facilitates the absorption of oil through the scalp, enhancing the delivery of medicinal ingredients to the hair follicles and scalp tissue (32) Additionally, by stimulating blood circulation, it promotes healthy scalp tissue (33) It is mainly used to manage symptoms such as dryness, itching, and scaliness, which are commonly seen in dandruff. The mechanical action of the massage exfoliates the scalp to remove dead skin cells. Consistent exfoliation through massage keeps the scalp clean and reduces the chances of dandruff recurrence.

The results of this study highlight the potential of Bhringaraja Oil head massage as an effective complementary therapy for dandruff. Its ability to reduce itching, hair fall, dryness of scalp and scaling provides a promising treatment option for patients. Future studies should focus on larger sample sizes, long-term follow-up, and comparisons with other standard treatments to better understand its full clinical potential.

Conclusion

The topical application of Bhringaraja oil through scalp massage for 20 minutes daily over 7 days demonstrated a significant reduction in dandruff symptoms, including dryness, flakiness, and itching. The therapeutic efficacy may be attributed to its *Vata-Kapha* pacifying properties, along with its antimicrobial, anti-inflammatory, and scalp-nourishing effects. This intervention supports improved scalp health and creates an unfavorable environment for dandruff-causing pathogens. Hence, *Shiroabhyanga* with Bhringaraja oil emerges as an effective, natural approach for dandruff management.

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Conflicts of interest: No Conflict of Interest

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