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Short Communication

Clinical efficacy of *Vrukshamla Beeja Taila* (Kokum Butter) in the Management of *Padadari* (Cracked Heels)

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ABSTRACT

Introduction: *Padadari* (Cracked heels) is one of the commonly existing podiatric diseases in our society, which is basically caused by the habit of excessive walking that is often associated with excessive dryness leading to the cracking or splitting. Kokum butter oil extracted from the seeds of *Vrukshamla* (*Garcinia indica* Choisy.) is used by folklore *Vaidyas* in Western Ghats of India to treat *Padadari*, but no study has been documented till date regarding its efficacy in the management of the *Padadari*. The drug is available easily and used extensively in folk practice. ***Methods***: The *Vrukshamla beeja taila* (VBT) was prepared by traditional seed-kernel boiling method and then given to 23 patients of *Padadari*, which were selected from out-patient and in-patient departments of SDM Hospital of Ayurveda, Udupi. It was given for external application on the site of lesion for twice a day that is morning and night before sleeping, for 15 days. ***Results***: Except oozing, all assessment parameters were found to be statistically significant. ***Conclusion***: The study revealed that the VBT a significant effect in the management of *Padadari*.

KEYWORDS

Garcinia indica Choisy, *Vrukshamlabeeja-taila*, Kokum butter, *Padadari*, Cracked heels

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*P*adadari (cracked heals) is one of the commonest occurring podiatric diseases in our society. It occurs in a person, who walks excessively, which eventually leads to *Sthanika Vatadushti* (localized vitiation of *Vatadosha*), due to increased *rukshatwa*, in their *Padapradesha*, leading to the occurrence of *Daree* (Cracks) at *Padapradesha* that is often associated with *Ruja* (Pain).[1] Sometimes, in severe condition, the routine becomes very cumbersome; especially when it's associated with bleeding and infection in cracks. The commonly experienced symptoms of *Padadari* are *Vedana* (Pain), *Rukshatwa* (dryness), *Kharatwa* (Roughness), *Kandu* (itching) and, seldom, *Daha* (burning sensation).

Seed-oil of *Vrukshamla* (*Garcinia indica* Choisy.) is called as Ghee or oil of Kokum, which is used in cracked hands and feet and various other skin ailments by folklore *vaidya*s of Western Ghat as it's very nutritious, unctuous, *Mardavakara* (gives *mrudutwa* (softness)).[2] Various uses of it have been mentioned in Ayurveda, including the use as an ingredient in different *Varti* and *Malahara Kalpanas* and such other preparations.[3] It is also used in dysentery and diarrhea-with-mucus, applied externally to ulcerations, fissured-lips, chapped skin and skin diseases.[2]

Although some of such folk healing prescriptions have been referred in the classical texts, practical understanding remains inaccessible to most of the people. Documentation of local health traditions was made priority decades ago primarily to preserve the knowledge from disappearing. However, not enough work has been done to examine the efficacy of various medicinal uses of plants used by tribal people and villagers; or to protect this knowledge from being purloined and claimed as a discovery. The use of *Vrukshamla beeja taila* (VBT) is commonly practiced by the people of Western Ghats in India and its clinical effect in *Padadari* is neither analytically studied, nor documented before. Hence, here, an attempt has been made to study the clinical effect of VBT in the management of *Padadari*.

Plant Material

Seeds of *Vrukshamla* were collected from Udupi district and surrounding forest area of South Kanara.

Preparation of *Vrukshamla beeja taila*

Traditional boiling-method was followed in this study; for which the collected seeds were dried completely under sunlight. Thereafter, the kernels were obtained by removing the seed-coat manually. Kernels were further subjected to trituration with sufficient quantity of water, for the preparation of paste. That was mixed with 3 litres of water (per kg of seed-kernel) in a vessel and subjected to heat on mild flame for very long time. After some time, a layer of oil started floating on the water, which was skimmed off and taken into another vessel. This second vessel was also simultaneously subjected to the heat on the other stove, until the remnant of water evaporates and the oil remains alone. This oil was allowed to cool down at room temperature and

solid Kokum butter was obtained. Heating the first vessel was continued until no or negligible quantity of oil floated. Obtained quantity of Kokum butter was 40 gm per kg of seed-kernel.

Clinical Study

Source of data

A single blind clinical study was conducted on 23 patients suffering from *Padadari*. Patients were randomly selected from OPD and IPD of SDM Hospital of Ayurveda, Kuthpady, Udupi.

Inclusion criteria

Patients of all ages, regardless of their gender, having cracked heels, were considered for the study.

Exclusion criteria

Patients suffering from the systemic diseases; like diabetes mellitus, hypertension, metabolic syndrome were excluded. Also, those, who were suffering from psoriasis; genetic conditions, like down syndrome; autoimmune conditions like plantar keratoderma, etc. were not considered for the study.

Blood investigations

Prior to selecting the patients for the study, complete haemogram with ESR and random/post prandial blood sugar test were performed in all of them to ensure the absence of exclusion criteria.

Methodology

Prepared VBT was given to the patients (40gm per patient). Then, they were asked to apply it externally on their cracked heels after cleaning their heels by washing with lukewarm water, twice a day, for 15 days. They were asked to melt the drug each time, prior to the application, by indirect-heating method that is heating in a vessel, which is kept on hot water. The procedure of first application of the drug was done by the investigators on each patient for the purpose of demonstration. They were also advised to avoid the contact with dust & mud and wear soft, clean, cotton cloths while going out of the house. First follow up was conducted on 7th day of the treatment and then on 15th day of the treatment, for each patient; and the assessment was made after the course of therapy.

Assessment criteria

Objective parameters like number of the cracks; depth of the cracks, assessed by using a small, toothpick-like stick, which was further correlated with measuring tape to calculate the corresponding length; length of the lesion, mild oozing and color were considered.

Subjective parameters like pain (*Vedana*), burning (*daaha*), itching (*Kandu*) and dryness (*Shushkata*) were used (Table 1).

In this study, in order to concise, precise and effective statistical interpretation; the statistical data (scores) obtained from both different feet (right and left) of the patients were combined by calculating the arithmetic mean for subjective parameters (Table 1) and the summation for objective parameters (Table 2). As subjective parameters are quite easily influenced by individual feelings and opinions, the arithmetic mean of the scores of both soles of a patient was preferred over the summation of them in each respective patient; whereas the objective parameters are not influenced by individual feelings and opinions, the summation of the scores of both soles of a patient was preferred over the arithmetic mean of them in the each respective patient.

Table 1. Scoring of subjective parameters

		Right Sole	Left Sole	Mean	Comment, if any
1.	**Pain**	0 – Absent			
		1 – Present on walking			
		2 – Mildly present at rest			
		3 – severely felt at rest			
2.	**Burning**	0 – Absent			
		1 – Present on walking			
		2 – Mildly present at rest			
		3 – severely felt at rest			
3.	**Itching**	0 – Absent			
		1 – Present on walking			
		2 – Mildly present at rest			
		3 – severely felt at rest			
4.	**Dryness**	0 – Absent			
		1 – Present			

Statistical tool

Paired-t Test for statistical analysis of both, viz. subjective and objective, parameters.

Table 2. Scoring of objective parameters

			Right sole	Left sole	Total
1.	**Number of Cracks**				
2.	**Depth of Cracks (in mm)**				
3.	**Length of the lesion (in cm)**				
4.	**Oozing**	0 – Absent			
		1 – Watery			
		2 - Bloody			
5.	**Colour**	0 – Pink			
		1 – Whitish Pink			
		2 – Pinkish White			
		3 – White			

The assessment of results was made by adopting the standard methods of scoring the signs and symptoms of *Padadari*. On the basis of all subjective as well as objective parameters, it can be stated that the effect of the intervention was found to be statistically significant, except oozing, where the 'P' value was 0.328, which is > 0.20. This is indicative of the change that occurred with the treatment is not great enough to exclude the possibility that the difference is due to chance. That is, probably due to the presence of oozing (serous bleeding with no sign of infection observed) on day-0 (BT) in only one out of total 23 patients (Table 3).

Table 3. Effect of the treatment of VBT

Parameter	Number of patients (as per BT)	TIME OF OBSERVATION	MEAN SIZE		MD	SD	SE	't' value	'p' value
			BT	DT/ AT					
Pain	15	Day-7 (DT)	0.848	0.0652	0.783	0.229	0.0477	4.807	< 0.001
		Day-15 (AT)	0.848	0.00	0.848	0.000	0.000	4.736	< 0.001
Burning Sensation	4	Day-7 (DT)	0.174	0.000	0.174	0.000	0.000	2.152	0.043
		Day-15 (AT)	0.174	0.000	0.174	0.000	0.000	2.152	0.043
Itching Sensation	9	Day-7 (DT)	0.652	0.130	0.522	0.344	0.0718	3.425	0.002
		Day-15 (AT)	0.652	0.000	0.652	0.000	0.000	3.347	0.003
Dryness of Lesion	22	Day-7 (DT)	0.957	0.413	0.544	0.492	0.103	5.234	< 0.001
		Day-15 (AT)	0.957	0.0217	0.9353	0.104	0.0217	19.59	< 0.001
Number of Cracks	23	Day-7 (DT)	24.39	17.913	6.478	8.821	1.839	5.115	< 0.001
		Day-15 (AT)	24.39	13.826	10.565	7.872	1.641	8.059	< 0.001
Depth of Cracks	21	Day-7 (DT)	2.239	1.357	0.882	1.485	0.310	4.434	< 0.001
		Day-15 (AT)	2.239	0.817	1.422	0.963	0.201	4.855	< 0.001
Length of Lesion	23	Day-7 (DT)	25.36	20.441	4.918	6.694	1.396	6.437	< 0.001
		Day-15 (AT)	25.36	16.065	9.294	6.582	1.372	10.11	< 0.001
Oozing	1	Day-7 (DT)	0.087	0.000	0.0870	0.000	0.000	1.000	> 0.20
		Day-15 (AT)	0.087	0.000	0.0870	0.000	0.000	1.000	> 0.20
Colour of Lesion	23	Day-7 (DT)	1.870	0.826	1.044	0.834	0.174	4.362	< 0.001
		Day-15 (AT)	1.870	0.0435	1.8265	0.209	0.0435	8.509	< 0.001

BT: Before Treatment: Day-0; DT: During Treatment: Day-7; AT: After Treatment: Day-15

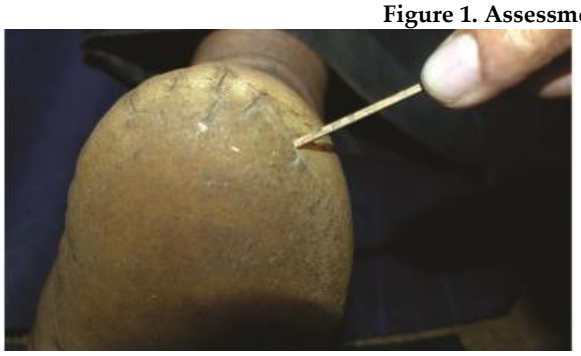
The statistically significant results in all assessment parameters; except oozing parameter; show the drug VBT is effective in the management of *Padadari*. Yet, on the 15th day of the treatment, most of the patients didn't receive 100% results in all parameters. This indicates the need of more days of treatment duration, than merely 15 days, for better improvement. The rate of improvement in each patient was according the severity of *Padadari*, before treatment.

Probable mode of action of VBT

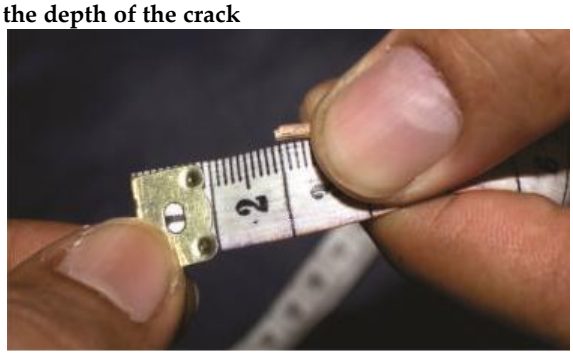
In general, overall, *Vrukshamla* is a *amla rasa pradhanadravya* and has *amla vipaka*; both, *amla rasa* and *amla vipaka*, perform the *vatahara* action.[4] Moreover, it's a *Ushnaveeryatmaka dravya*; thus it helps to normalize vitiated *vatadosha* by being *Ushna*. The seeds used for the preparation VBT are usually obtained from *Pakwa Phala*. So, some properties of *Pakwa Phala* might be present in its seeds and so in seed-oil as well. *Pakwa Phala* is said to be *Katu, Kashaya* and *Amla*.[5] Hence, that could be the reason for the *Vranaropana karma* by *Katu* & *Kashaya rasa*s and *Stambhana karma* by the *Kashaya rasa* of Kokum butter. Also, like any oil, kokum butter is *Snigdha*; which again helps in the correction of vitiated *Vatadosha*. In fact, it has butter-like solid consistency at room temperature, which provides unmeasurably high viscosity. In other words, it works by a phenomenon of *Samanya-Vishesha Siddhanta*. That is it replaces the absence of *Snigdhata, Ushnata, Mruduta, Soumyata* at *Padapradesha* and nullifies the opposite properties of vitiated *Vatadosha*, such as *Rukshata, Sheetata, Kharata, Kathinyata*, etc. In addition, the process of external

application of VBT provides the gentle massage to the feet, which is quite natural phenomenon, which also, probably, helps in increased local vascularity. This increased vascularity encourages faster healing.

Figure 1. Assessment of the depth of the crack



1.1 Assessment of depth of the crack using a small stick



1.2 Measuring the depth of the crack

Figure 2. Heels of the patients before and after the treatment

2.1 Patient 1

Before treatment

After treatment

2.2 Patient 2

Before treatment

After treatment

2.3 Patient 3

Before treatment

After treatment

CONCLUSION

Although the efficacy of VBT is already claimed by traditional *Vaidyas*; this clinical study showed that it has a significant effective in the management of *Padadari.* It was also found that the majority of the patients received more improvement in

subjective parameters than the objective parameters, within the course of 15 days, depending upon the severity of their disease before treatment; which showed the necessity of longer duration of the treatment course for complete recovery. Hence, a further comparative study with other formulations and line of treatments can be encouraged.

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CONFLICT OF INTEREST

Nil

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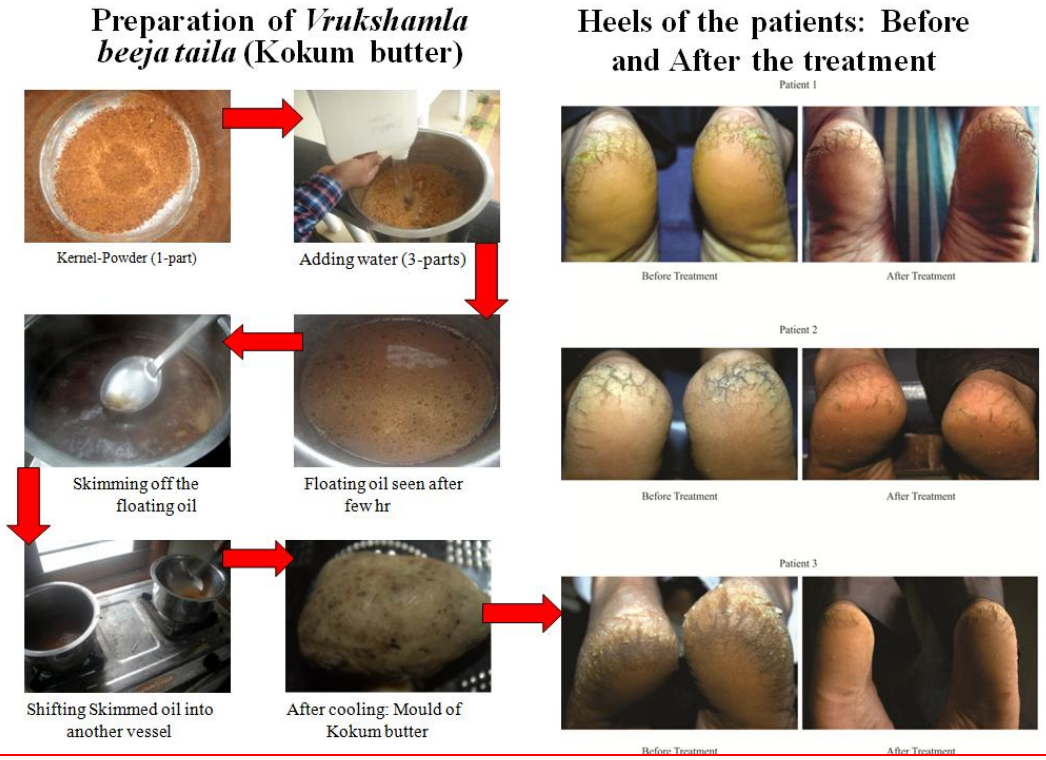
GRAPHICAL ABSTRACT



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