

Clinical Efficacy of *Padabhyanga* in Simple Myopia - A Pre-Test & Post-Test Study

Research Article

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Abstract

Around 253 million people worldwide live with some form of visual impairment. The leading causes of vision impairment are uncorrected refractive errors (e.g., myopia) and untreated cataracts. *Padabhyanga* (foot massage) is known to promote *Nidrakara* (good sleep), *Drishtiprasadana* (improve vision), *Shramahara* (relieve fatigue), *Deha Sukhakara* (comfort to the body), and induce *Pada Suptthinut* (sound sleep). There are two *Pruthu Siras* (large veins) in the central part of the foot that are directly connected to the eyes. Protecting the feet through *Abhyanga* (oil massage) and *Dhavana* (cleaning practices) is important for the overall well-being and protection of the eyes. Aim: To develop a simple and cost-effective remedy for simple myopia. Objectives: To assess the effectiveness of *Padaabhyanga* with *Moorchita Tila Taila* (special sesame oil) in simple myopia. Method: *Padaabhyanga* with 20ml *Moorchita Tila Taila* at 40°C on both feet for 14 days of 20 minutes duration. Results: A significant improvement in eyesight and eye-related problems in myopic disorder. Conclusion: This trial may provide evidence of the efficacy of the treatment in myopic syndrome.

Keywords: Myopia, *Padaabhyanga*, *Moorchita Tila Taila*, Clinical study.

Introduction

Myopia, also known as short-sightedness, is a common refractive error where parallel rays of light focus in front of the retina when the eye is at rest (1). The choice of treatment depends on various factors, including age, lifestyle, eye health, and personal preferences (2). *Abhyanga* is usually performed as part of *Shariraabhyanga* (body massage), which refers to the application of oil massage to the entire body (3). It is considered an integral part of *Dinacharya* (daily routine) and *Ritucharya* (seasonal discipline) for maintaining health in a healthy individual (4). However, in the case of diseases, *Abhyanga* is used as a therapeutic measure known as *Shamana Chikitsa* (procedure to reduce, suppress and eliminate disease symptoms). *Abhyanga* can be performed either on specific body parts or on the entire body. *Padaabhyanga* is a relatively less explored technique in the field of *Panchakarma*. It has often been overlooked compared to other mainstream Ayurvedic treatments (5). However, considering its association with *Drishtiprasadana* improving vision, it deserves considerable importance, especially in the management

of simple myopia (6). While there are various modalities used in the management of simple myopia, the most common approach is optical correction through the use of minus-power glasses. Surgical correction and laser treatment are also options but are expensive and may not always yield significant improvements in visual acuity and clinical refraction (7). By understanding the interconnectedness of the feet and eyes, as mentioned in the ancient Ayurvedic texts, it is believed that regular foot massage can have a positive impact on vision (8). It is important to integrate traditional Ayurvedic practices with modern scientific approaches to provide comprehensive and effective solutions for visual impairments (9-11). Therefore, an attempt is being made to develop an economical and effective management strategy for simple myopia through the practice of *Padaabhyanga*.

Research Design

Research question

Is there any significant effectiveness of *Padaabhyanga* with *Murchita Tila Taila* in simple myopia of the age group 18 years to 40 years for a period of 14 days with a duration of 20 minutes per day during the period of 2017-2020.

Research design

Single-blind randomized clinical trial was conducted on 30 patients aged between 18 to 40 years of either sex at MVR Ayurveda Medical College.

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Inclusion criteria:

- 1) Patients with lens power between -0.25D to -6D.
- 2) Patients of either sex presenting with any signs and symptoms of simple myopia.
- 3) Patients between the age group of 18 years to 40 years.
- 4) Patients who have given informed consent.

Exclusion Criteria:

- 1) Patients contraindicated for Abhyanga
- 2) Patients of other ocular diseases
- 3) Other serious systemic illness
- 4) Patients who have undergone any refractive surgeries

Baseline of Assessment:

The following subjective and objective complaints were selected and assessed before and after *Padabhyanga*.

A. Subjective parameters

1. Blurred distant vision
2. Eye strain
3. Headache
4. Watery discharge of eye

B. Objective parameters

1. Visual acuity
2. Lens power using autorefractometer

Period of clinical trials:

Study period: 18 months

Procedure duration: 14 days

Materials and methods

In healthy individuals' oil may prescribe according to the *Prakriti (nature)* of the client as; for *Vata Prakriti (melancholic)* – *Himasagara Taila*; for *Pitta Prakriti (bile)* – *Chandanadi Taila*, *Chandanabala Lakshadi Taila*, *Ksheerabala Taila*; for *Kaphaprakriti*

(cough) – *Triphalyadi Taila*; for *Sama Prakriti (same nature)* – *Asanabilwadi Taila*. *Snehayonis* (sources of oil) are of two types; *Sthavara Yoni* (plant) and *Jangama Yoni*. Among *Sthavara Yoni* drugs, *Tila* is mentioned first, by Acharya Charaka. That shows *Tila*'s *Pradhanyata*. *Tila Taila* is the most *Vishesha Taila* among other varieties for *Balartha* and *Snehana* purposes. Plant materials in **Table I** were certified at Panchakarma, MVR Ayurveda Medical College, Parassinikkadavu, Kannur for the preparation of *Moorchita Tila Taila*.

Sambhara Sangraha (Materials)

The collection of medicine, and steel vessels for heating *Taila* in double boiling method, were included in *Sambhara Sangraha*. *Moorchita Tila Taila* for *Padaabhyanga* was prepared in the pharmacy of MVR Ayurveda Medical College, Parassinikkadavu, Kannur. 10 liters were prepared with the ingredients *Manjishtha*, *Haridra*, *Lodhra*, *Musta*, *Padma*, *Amalaka*, *Vibheetaki*, *Haritaki*, and *Ketaki*. *Manjishtha* (500g), and the remaining other drugs taken were 100g each. When *Khara Paka* was attained *Taila* was taken back from the furnace. After *Swanga Sheeta (self-cooling)*, *Taila* was poured into a can and kept safely. Figure 1 illustrates the steps for *Moorchita Tila* preparation.

Figure 1: Steps for Moorchita Tila Preparation



Table 1: Plants used here for the preparation of Moorchita Tila Taila

S. No.	Plant	Family	Karma (Functions)	Ref.
1	<i>Sesamum indicum</i>	Pedaliaceae	<i>Vataghna</i> (mitigates vata, one of the three doshas), <i>Kaphapittakrit</i> , <i>Twachya</i> (improves skin texture), <i>Balya</i> (improves the strength of the body), <i>Keshya</i> (beneficial to the hair).	(12)
2	<i>Rubia cordifolia</i> Linn	Rubiaceae	<i>Kapha hara</i> (mitigates kapha one of the three dosha) <i>Raktahara</i> (mitigates diseases related to blood) <i>Swaravarnakrit</i> (improves voice and complexion) ; it cures <i>Visha</i> (poison), <i>Sopha</i> (odema) <i>Yoniruk</i> (pain in vaginal tract), <i>Akshiruk</i> (pain in eyes), <i>Karnaruk</i> (pain in ear), <i>Raktatisara</i> (blood mixed stool), <i>Kusta</i> (skin disease), <i>Visarpa</i> (herpes zoster), <i>Vrana</i> (ulcer), <i>Meha</i> (diabetes mellitus) <i>Jwara</i> (fever), <i>Arsa</i> (hemorrhoids)	(13)
3	<i>Curcuma longa</i> Linn	Zingiberaceae	<i>Kaphapittanut</i> (mitigates pitta and kapha), <i>Kaphavatanut</i> (mitigates vata and kapha,) <i>Asranut</i> , mitigates (disease of rakta) <i>Varnya</i> ; it cures <i>Twakdosha</i> , <i>Meha</i> , <i>Sopha</i> , <i>Pandu</i> (anemia), <i>Vrana</i> , <i>Visha</i> , <i>Kandu</i> (itching), <i>Krimi</i> (intestinal helminthiasis), <i>Peenasa</i> (running nose), <i>Aruchi</i> (anorexia), <i>Apachi</i> .	(14)
4	<i>Symplocos racemosa</i> Roxb	Symplocaceae	<i>Kaphavataghna</i> , <i>Kaphapittanut</i> , <i>Raktajit</i> , <i>Chakshushya</i> (good for eyes), <i>Rochana</i> (helps in healing), <i>Grahi</i> (increases bulk of the stool); it cures <i>Netra Srava Vikara</i> , <i>Asrigdara</i> , <i>Atisara</i> (diaphorea), <i>Raktapitta</i> , <i>Sopha</i> , <i>Trishna</i> (thirst), <i>Arochaka</i> , <i>Visha</i>	(15)
5	<i>Cyperus rotundus</i> Linn	Cyperaceae	<i>Sleshmaraktajit</i> , <i>Pittajit</i> , <i>Grahi</i> , <i>Deepana</i> (improves digestion), <i>Pachana</i> , <i>Lekhana</i> , <i>Stanyasodhana</i> (purifies breast milk); it cures <i>Jwara</i> , <i>Atisara</i> , <i>Trishna</i> , <i>Daha</i> , <i>Krimi</i> , <i>Aruchi</i> .	(16)

6	<i>Emblica officinalis Gaertn</i>	Euphorbiaceae	<i>Sarvadoshaghni</i> (remedy for all disease), <i>Chakshushya</i> (good for the eyes), <i>Vrishya</i> (aprodiastic), <i>Rasayana</i> , <i>Ruchya Cures Raktapitta</i> , <i>Prameha</i> , <i>Srama</i> (tiredness), <i>Vamana</i> (stops vomiting), <i>Vibandha</i> (cures constipation), <i>Adhmana</i> (cures distension of abdomen), <i>Vishtambha</i>	(17)
7	<i>Terminalia bellerica Roxb</i>	Combretaceae	<i>Kaphahara</i> , <i>Kaphapittanut</i> , <i>Kaphasrajit</i> , <i>Kaphamarutasana</i> , <i>Chakshushya</i> , <i>Kesajanana</i> , <i>Swarya</i> , <i>Bhedana</i> , <i>Sara</i> , <i>Madakara Cures Kasa</i> (cough), <i>Swasa</i> (cures asthma), <i>Hikka</i> (cures hiccup), <i>Krimi</i> , <i>Palita</i> (stops greying of hair), <i>Hridroga</i> (good for the heart)	(18)
8	<i>Terminalia chebula Retz</i>	Combretaceae	<i>Tridoshaghni Lekhani Medhya</i> (brain tonic), <i>Chakshuhita</i> , <i>Vatanulomani</i> , <i>Hridya</i> , <i>Rasayani</i> , <i>Rechani</i> (helps in easy evacuation of the bowel), <i>Deepana</i> , <i>Balya</i> , and <i>Indriyaprasadani</i> (supports the sense organs). Cures <i>Meha</i> , <i>Kusta</i> , <i>Vrana</i> , <i>Chardi</i> , <i>Sopha</i> , <i>Vatarakta</i> (gouty arthritis), <i>Mutrakrichra</i> , <i>Vishamajwara</i> , <i>Puranajwara</i>	(19)
9	<i>Plectranthus vettiveroides</i>	Lamiaceae	<i>Pittasleshmanut Raktahara Deepana</i> , <i>Pachana</i> , <i>Kesya</i> . Cures <i>Hrillasa</i> , <i>Aruchi</i> , <i>Visarpa</i> , <i>Hridroga</i> , <i>Atisara</i> , <i>Jwara</i> , <i>Swasa</i> , <i>Kushta</i> , <i>Switra</i> (leukoderma), <i>Vrana</i> , <i>Vanti</i> , <i>Trishna</i> , <i>Raktapitta</i> , <i>Kandu</i> , <i>Daha</i>	(20)

The preparation of Sneha was mainly divided into three *Paka(texture)*. They were *Mridu Paka*, *Manda (soft)*, *Madhyam Paka*, *Cikkana (semi-hard/medium)*, *Khara Paka*, *Khara cikkana (very hard)*. The *Kalka* became *Varti (wick)* like substance when it is rolled between two fingers. There was nosound when *Sneha Kalka(fine paste)* was sprinkled over the fire. Foam was observed when *Taila Paka* completed, and in the case of *Grita (lipidic)*, foam subsided. Specific colour, odour and taste of the ingredients became marked when *Snehapaka* was over (21, 22).

Procedure for Padabhyanga

The process of *Padaabhyanga* involves applying oil to the feet (both dorsal and plantar aspects), followed by a massage using various movements. Refer to Figure 2 for the procedure adopted here for the *Padabhayanga*.

Figure 2: Procedure of padabhyanga (A) Smearing of Taila; (B) Linear Massage (C) Circular Massage; (D)Left Lateral Massage



Position of the client

On the *Abhyanga* table, the client was asked to lie down. The client was placed in a supine, lateral, or prone position for *abhyanga*. In a water bath, oil was heated to about 40°C before being applied. Warm oil was applied to the plantar and dorsal surfaces of the foot up to the ankle. After that, the therapist began to massage the patient by moving his palm in various directions.

Linear manoeuvre on the foot

The therapist was positioned at the head end of the table, facing the foot. The client's leg was held slightly above the ankle with both hands while they

were supine. After that, a lot of pressure was applied to extract the foot. In the prone position, the client's foot was grabbed with both hands at the midpoint of the sole, roughly resembling the two thumbs. The foot was then milked out using sufficient pressure.

Linear manoeuvre on the sides of the foot

The client was in the lateral position with one leg bent at the knee and the other leg with the foot resting on the ankle. The thumb pulps of both hands were placed directly below the ankles by the therapist. The therapist then applied hard pressure to the little toe with his thumbs slipped distally.

Linear manoeuvre on the dorsum of the foot

The client was positioned supine during this manoeuvre. The therapist firmly pressed the thumb of the other hand on one of the soft spaces between the bones on the dorsum of the client's foot while holding the client's foot in one hand near the ankle. He then applied forceful pressure with a sliding of his thumb towards the toes. On the dorsum of the foot, each soft area between the bones was treated in this manner.

Thumb poking on the soles

The client can be comfortably supine while this technique was done. The client's foot was stabilised by both hands being placed on the dorsum of the foot with the thumbs on the soles. The soles were then gently but firmly probed with thumbs. This technique treated the entire sole.

Linear manoeuvre on the soles

The client was in a prone posture during this manipulation. Thumbs roughly on the heel and other fingers at the dorsum of the foot, the therapist hold the client's heel with both hands. The client's foot was then moved from the sole to the tips of the toes using a milking motion. The pulp of the thumb was used to apply hard pressure while doing so to the sole.

Circular manoeuvre on the pads

In the supine posture, the client was positioned. With his fingers at the dorsum of the foot and his thumb at the soles of the pads, the therapist grasped the client's

foot. Applying strong pressure, the thumb then moved in a circular motion over the sole pads.

To and fro manoeuvre on the soles

The therapist hold the patient's leg at the ankle while they were lying on their backs. The sole was rubbed along its length in both directions with the palmar surfaces of the opposite hands

Linear and circular massage on toes

With one hand securely holding the client's leg at the ankle, the other hand massages each toe separately. The toe of this client was held in place by the thumb and index finger. The toe was then exploited by applying circular motion to the toe joints and linear motion between the joints.

Linear massage on web spaces

One hand stabilised the foot by grasping it, and the other inserts its index finger into the web space between the big toe and the second toe. The index finger was then repeatedly dragged back and forth while applying hard pressure to the web space's floor. The same treatment was given to other web spaces as well. For the oil to have a systemic effect, it must be absorbed into the skin. Regarding the length of time needed for the oil and the herbal elements contained in it to be absorbed, it has been noted that as time goes on, the oil enters the body's tissues at a deeper and deeper level.

After procedure

After receiving *Padaabhyanga* as part of *Shariraabhyanga* or as a regular practice in a healthy individual, the recipient was instructed to relax for 15 to 30 minutes. After a nap, they might be permitted to take a hot bath. Following a bath, oil was given to the feet of clients who have skin conditions and left there for several hours or until the next application. Bengal gramme powder was used to clear the oil.

Precautions

Necessary aseptic measures was taken if the client was suffering from communicable disorders.

Data Analysis

All the data collected were analyzed with a statistical test using SPSS version 20 software. Wilcoxon signed-rank test was done post-Hoc with Bonferroni correction to interpret the time of significant change.

Results and discussion

Blurred distant vision

Following therapy, there was significant changes noticed in the subjects as the z-value=-3.162 with p value = 0.002 which was ≤ 0.025 and on the follow up there was highly significant changes noticed in the subject as the z value=-3.742 with p value =0.0001 which was ≤ 0.025 . (All the 30 patients had blurred vision and after the treatment 10 got improvement and during follow up 14 got improvement).

Eye strain

Following treatment, there was significant changes noticed in the subjects as the z-value=-2.236 with p value = 0.025 which was ≤ 0.025 and on the follow up there was significant changes noticed in the subject as the z value=-2.333 with p value =0.020 which was ≤ 0.025 . (Out of the 30 patients 6 was having Eye Strain and it was found that after the treatment 5 got relief and during follow up it was found that all the 6 got relief in eye strain).

Visual Acuity

For right eye, after treatment there was significant changes noticed in the subjects as the z-value=-3.276 with p value = 0.001 which was < 0.025 and on the follow up there was highly significant changes noticed in the subject as the z value=-3.626 with p value =0.0001 which was ≤ 0.025 . For left eye there was significant changes noticed in the subjects as the z-value=-3.162 with p value = 0.002 which was ≤ 0.025 and on the follow up there was highly significant changes noticed in the subject as the z value=-3.500 with p value =0.0001 which was < 0.025 .

Lens power using an auto refractometer

For right eye after treatment and during follow up there was no significant changes noticed in the subjects as the p value ≥ 0.025 . For left eye, after treatment and during Follow up there was no significant changes noticed in the subjects as the p value ≥ 0.025 .

Padabhyanga Lakshana

Nidra

After therapy, there were noticeable changes in the participants, as indicated by the z-value=-3.317 and p-value = 0.0001 (0.05), which indicated, *Nidra* had improved with a positive rank of 11.

Shramahara

Following therapy, there were noticeable improvements in the individuals, as seen by the z-value of -4.618 and the p-value of 0.0001 (0.05), which indicated that *Sramahara* improved with a positive rank of 27.

Snigdhatta of Pada

After therapy, there were noticeable improvements in the participants, as indicated by the z-value of -7.940 and the p-value of 0.0001 (0.05), which indicates that *Snigdhatta* improved with a positive rank of 30.

Mridutwa of Pada

After the treatment, the participants showed substantial improvement as indicated by the z-value of -5.069 and the p-value of 0.0001, which is 0.05 and indicates that *Mridutwa* improved with a positive rank of 30.

Watering of eyes

No significant changes were observed in the participants after therapy and during follow-up, as indicated by the p-value of 0.025. Out of the 30 patients, only 5 had eye-watering. It was discovered that after the therapy, 2 had relief and that during follow-up, 3 had relief.

Headache

There was no discernible change in the participants' condition during therapy and follow-up, as indicated by the p -value ≥ 0.025 (Bonferroni correction) 0.025. Out of the 30 patients, only 2 had headaches, and it was discovered that 2 of them had improved during therapy, and one had improved during follow-up. Because there were not many patients who suffer from headaches, this condition could not be generalised or addressed.

Conclusion

In addition to its high incidence, myopia increases the risk of conditions that could endanger one's eyesight and contributes to visual morbidity. As a consequence of the study's observations and findings, it can be said that *Padaabhyanga* was statistically significant in alleviating eye strain, moist eyes, hazy distant vision, and visual acuity. Following therapy, the auto-refractometer reading was not statistically significant. A small improvement in eyesight was seen in a few patients' dioptric powers, which were reduced in some cases by 0.25D to 0.50D. Better outcomes might be reached if the patients followed *Pathyaapthyas* and *Nidana Parivarjana*. Both during and after the treatment, no adverse effects were noticed. Instead, every day, every patient was active. A few patients saw improvements in their *Agni*, and their *Kshut* level rose. For greater outcomes, the length of *Padaabhyanga* might be extended to 28 or 56 days. During *Padaabhyanga*, one might follow *Pathyas* and avoid *Apathyas*. Also, eye exercises can be suggested as a synergistic activity with *Padaabhyanga*.

Ethical Clearance

The ethics committee authorised the research topic reference No IEC/PK2/ 2018/02 after it had been critically examined and presented.

Consent or assent

Before beginning the study, we obtained the patient's signed consent. Each patient's confidentiality was appropriately protected throughout the trial.

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