



Review Article

CTRI registered studies on Timira with Reference to Refractive Errors: A Descriptive Analysis and SWOT Assessment

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Received: 29-11-2025

Accepted: 06-09-2026

Published: 30-09-2026

Abstract

Background: *Timira* is a classical Ayurvedic condition associated with visual disturbances and has been correlated with refractive errors such as myopia, hypermetropia, and presbyopia. Several Ayurvedic interventions for *Timira* have been investigated and registered in the Clinical Trials Registry–India (CTRI). **Objective:** To review and describe the characteristics of CTRI-registered studies on *Timira* with reference to refractive errors and to assess the strengths, weaknesses, opportunities, and threats (SWOT) associated with the Ayurvedic therapeutic procedures investigated. **Materials and Methods:** A descriptive registry-based analysis was conducted using data extracted from the CTRI database for studies registered between 2013 and 2023. The search included the terms “Myopia,” “*Timira*,” and “*Prathama-Dwitiya Patalagata Timira*.” The registered studies were analysed with respect to study status, age group, study design, sample size, treatment duration, interventions, route of administration, and geographical distribution. A SWOT analysis was performed to identify factors influencing the feasibility and standardization of Ayurvedic therapeutic procedures. **Results:** A total of 28 CTRI-registered studies were identified, comprising 16 completed and 12 ongoing studies. The studies included both observational and interventional designs and involved different age groups, sample sizes, treatment durations, and Ayurvedic interventions. Interventions included oral medications and local therapeutic procedures such as *Tarpana*, *Nasya*, *Anjana*, *Ghratapana*, and *Aschyotana*. The highest number of registered studies was reported from Gujarat, followed by Maharashtra, Uttarakhand, Delhi, Karnataka, Rajasthan, Telangana, and Uttar Pradesh. Lack of standardization, variable patient compliance, limited clinical evidence, and heterogeneity of treatment protocols were identified as important challenges. **Conclusion:** The review demonstrates ongoing research interest in Ayurvedic approaches to *Timira* and refractive errors. Standardization of *Kriyakalpa* procedures, improved registry reporting, appropriate outcome measures, and rigorous clinical research are required to strengthen the evidence base.

Keywords: *Timira*, Refractive errors, Myopia, CTRI, Ayurveda, *Shalakyatantra*

Access this article
online

Website:
<https://ijam.co.in>



DOI: <https://doi.org/10.47552/ijam.v17i3.6764>

Introduction

Vision, or *Drushti*, is an important sense in the human body. In Ayurvedic literature, any disturbance of visual acuity is referred to as *Timira*. (1) This condition is related to the first two internal *Patala* (layers/coverings of the eyeball) of the eyeball. (2) Individuals who engage in excessive use of mobile devices, television, and computers, as well as those with irregular sleep patterns and dietary habits, are more susceptible to refractive errors. The refractive error is determined by three major factors: the curvature of the cornea, the position and refractive power of

the lens, and the axial length of the eye. Myopia, hypermetropia, and presbyopia closely resemble *Timira*, which is characterized by symptoms such as *Rupamavyaktam Ikshate* (blurring vision), *Vyakatmapya Nimitta* (~intermittent spontaneous clear vision), and *Dooram Nekshate* (~cannot see distant or minute objects). (3)

Population-based studies have estimated that the prevalence of myopia in India is 27.7%, while the prevalence of hyperopia is 22.9%. These rates are known to increase in school-going children and young adults. (4) According to the World Health Organization (WHO), 43% of visual impairment is caused by uncorrected refractive errors. Globally, an estimated 1.3 billion people live with some form of vision impairment. (5) Myopia is a reversible cause of blindness and is the fourth major cause of vision loss, according to a sight-saving review from 1979. Due to its global importance, myopia has been chosen as a priority for the WHO's Vision 2020 initiative, aimed at treating and preventing blindness by the year 2020. (6)

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In the field of Ophthalmology, modern science has made advancements in the treatment of myopia through the use of spectacles, contact lenses, and refractive surgeries. However, these treatments can be costly and may have complications. (7) In Ayurveda, myopia, can be correlated more or less as "*Timira*," is considered to be medically curable if treated in its early stages. (8) Various Ayurvedic treatments, including *Langhana* (~therapeutic fasting), *Snehana* with *Ghratapana* (internal use of ghee), *Raktamokshna* (~bloodletting), *Nasya* (~medication through nasal route), *Virechana* (~therapeutic purgation), *Basti* (~therapeutic enema), *Tarpan* (~therapeutic retention of medicated liquids over the eyes), *Aschyotana* (~eye drops), *Anjana* (~collyrium) and ocular exercise, have been used to treat *Timira*. (9)

Despite the potential benefits of Ayurvedic treatments, there is a lack of clinical trial data on the efficacy of these treatments. This is partly because of the limited number of participants registered for clinical trials on the Clinical Trials Registry of India (CTRI), coupled with inadequacies in healthcare services, inconsistent regulation, and unequal access to affordable healthcare. The registration of more trials on the CTRI and the addition of a data set would help further study in the field of Ayurveda and avoid duplicate research. CTRI registration is important for Ayurveda clinical trials as it ensures compliance with regulations, promotes transparency, ensures ethical review, provides quality assurance and promotes the field of Ayurveda. (10) This preliminary study includes an analytic review of 28 CTRI-registered trials.

Materials and Methods

A descriptive registry-based analysis was conducted using records from the Clinical Trials Registry–India (CTRI) database (www.ctri.nic.in). Studies registered between 2013 and 2023 and related to *Timira*/refractive errors were identified using the keywords "Myopia," "*Timira*," and "*Prathama-Dwitiya Patalagata Timira*."

A total of 28 relevant CTRI-registered studies were identified and included in the analysis, comprising 16 completed and 12 ongoing studies. Both observational and interventional studies were included. Data were extracted from the individual CTRI records and compiled in a master chart. The variables assessed were CTRI registration number and date, study title, type of trial, study design, age criteria, intervention/comparator, sample size, study duration, and primary sponsor. Information was recorded as reported by the respective registrants; missing or unspecified information was not inferred.

The registered studies were descriptively analysed according to age group, number of study arms, sample size, study duration, study type, intervention, and geographical distribution. Ayurvedic interventions were categorized based on the therapeutic modality

reported in the CTRI record, including local ocular procedures and internal/oral interventions. A state-wise analysis was performed to assess the geographical distribution of the registered studies. The extracted data were summarized using frequencies and presented graphically in Figures 1–7. A SWOT (Strengths, Weaknesses, Opportunities and Threats) assessment was subsequently performed based on the characteristics, interventions, and research patterns observed among the identified CTRI-registered studies.

Descriptive Analysis of the studies

In a total of 28 CTRI-registered trials, the age groups were distributed as follows: 10 trials (35.7%) included participants between 18 and 60 years of age, 9 trials (32.1%) included participants from 10 years of age, and 9 trials (32.1%) included participants from 5 years of age (Figure 1).

The eligibility criteria varied across the registered studies. Commonly reported criteria included specified age limits, absence of systemic or ocular pathology, and suitability for the respective intervention.

- Patients were selected based on the specified age limits and sample size,
- Patients did not possess any systemic or ocular pathologies, and
- Patients were deemed fit to undergo the assigned *Kriyakalpa* (therapeutic procedures for eye) procedures, such as *Tarpan*, *Nasya*, *Anjana*, *Ghratapana*, and *Aschyotana*.

Insights into Registered trials, assessment of Comparator/ Intervention details-

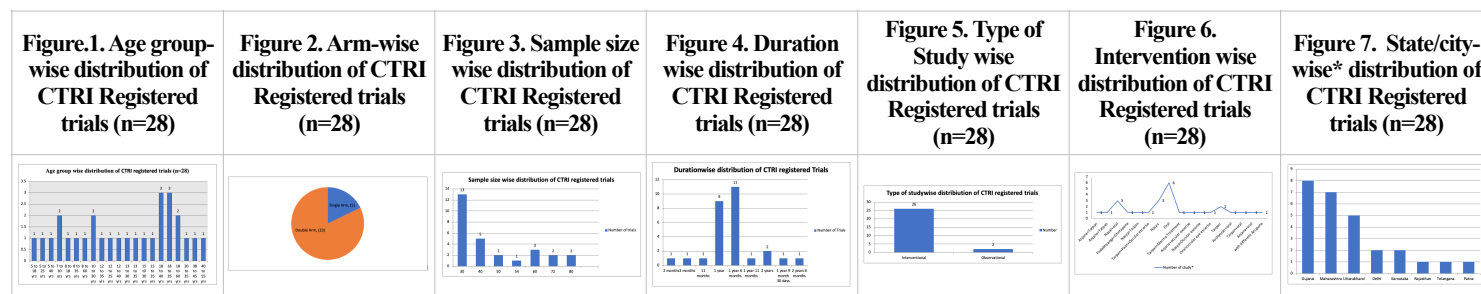
The registered studies primarily evaluated Ayurvedic interventions, including local ocular procedures and internal/oral therapies. A thorough analysis of the names and details of the intervention and comparator agents was conducted. However, the information regarding the specific details of the Ayurvedic intervention, such as mode of administration, age of the participants, and total duration of the treatment, was provided in 28 of the trials. Whereas, 25 of the trials included information regarding the dosage form and frequency of the administered medicine.

Assessment of Geographical distribution of trials:

A state-wise analysis was conducted to assess the geographical distribution of CTRI-registered trials among Ayurveda colleges across India.

The registry data showed that the highest number of trials were conducted in the state of Gujarat followed by Maharashtra, Uttarakhand, Delhi, Karnataka, Rajasthan, Telangana, and Uttar Pradesh. This information is depicted in Figure 7.

Observations



*One observational single arm study detail not mentioned about intervention; *One CTRI registered trial has missing the dataset not mentioned state

Discussion

The current short communication aimed to evaluate the characteristics of *Timira* disease clinical studies registered with the Clinical Trials Registry of India (CTRI) from 2013 to 2023. This analytical study of *Timira* trials included 12 ongoing and 16 completed studies. Our analysis included both observational and interventional trials that were registered until 2023. Of the 28 CTRI registered studies, six were administered via oral medication, with two of them being single-arm studies. (See Figure 6)

This study has revealed that the most commonly used mode of administration for the treatment of eye disease is internal/oral medication. Agnimandya (diminution of Agni) is a major contributing factor to the development of Ama (endotoxin), which in turn leads to *Srotodushti* (obstruction to *Srotas*) and *Sirabhisyanda* (trickling of Dosha in vessels or channels), both of which are pathological processes that initiate eye disease.⁽¹¹⁾ Hence *Timira* has been described in relation to disturbances involving Dosha and Dhatu function, with classical concepts such as Agnimandya, Ama and *Srotodushti* providing a theoretical framework for understanding its pathogenesis and these concepts represent the traditional Ayurvedic interpretation. The oral medication employed in treatment acts indirectly on the eyes by clearing obstructions within the *Srotas* (structural or functional channels), thereby allowing for proper nutrition to reach both the retina and the eye as a whole. The use of *Tarpana*, a method in which the lipophilic action of *Ghrta* is employed, facilitates the transportation of the medication to the target organ. This may result in a change in the refractive index of the cornea, thereby reducing the convergence of light rays. ⁽¹²⁾ Procedures such as *Tarpana*, *Nasya*, *Anjana* and *Aschyotana* are described in Ayurvedic literature and were identified among the interventions registered in CTRI. Their specific pharmacological, pharmacokinetic and physiological mechanisms, including the absorption and ocular distribution of locally administered formulations, require further experimental and clinical investigation. Therefore, these mechanisms should be considered as potential areas for future research rather than established explanations for the findings of the present study.

Nasya Karma is a therapeutic technique in which medicine is instilled into the nostrils and then distributed throughout the interior aspects of the head, including the *Shrungataka Marma* (~a junction points of the sense organs). The medicine then spreads to the junction points where all the channels related to the eyes, throat, and ears converge. In addition, *Anjana*, when applied, is absorbed through transcorneal absorption and subsequently moves into the aqueous humor. A portion of the drug is then absorbed into the intraocular tissues, while the remaining amount passes into the trabecular meshwork and episcleral pathway. ⁽¹³⁾

Ocular exercise has been demonstrated to improve blood circulation by increasing the supply of oxygen to the optic nerve, facial muscles, and brain. This results in a reduction in eye strain, an increase in the strength of the optic nerve, and a relaxation of ocular muscles. Ocular exercise has been shown to minimize the degree of refraction and prevent loss of vision. ⁽¹⁴⁾ In Ayurvedic medicine, the practice of *Ghratapana*, which involves the application of *Ghrta* (a type of ghee) to the eyes, has been found to have a beneficial effect on the *Pitta Dosha*, which is responsible for regulating body temperature and metabolic activities. *Ghrta* has been found to possess properties of *Rasayana* (rejuvenation), *Balya* (strengthening), and *Chakshyushya* (beneficial for eyes). In Ayurvedic medicine,

Aschyotana, which involves the administration of a drug into the lower fornix of the eye, is considered to be the first line of treatment for all eye-related disorders. ⁽¹⁵⁾ The drug administered in *Aschyotana* directly drains through the nasolacrimal duct into the nose and measurable systemic absorption occurs via the nasopharyngeal mucosa. ⁽¹⁶⁾

The use of eye drops and oral medication in practice is prevalent, however, further research on alternative routes of administration for these medications should be conducted to evaluate their feasibility and ease of use. The Central Register of Clinical Trials (CTRI) could be improved through the implementation of a more comprehensive and structured method for classifying the types of studies, the use of logic rules to mitigate internal inconsistencies, and the provision of additional information regarding each ethics committee, including its location and link to the relevant trial site. ⁽¹⁷⁾ The Clinical Trials Registry India (CTRI) could benefit from a more structured and organized system for categorizing the different types of clinical trials that are registered. This would provide a clear understanding of the nature and scope of the trials being conducted and make it easier to analyse the data. The use of data validation techniques to prevent internal inconsistencies like errors or contradictions while entering the data is another important aspect that could be looked for. This would ensure that the data entered into the registry are consistent and accurate, reducing the likelihood of errors or inaccuracies that could negatively impact the validity of the results. In addition, more information about each ethics committee would be beneficial. This could include the address of the committee, which would allow for easier communication and collaboration between the trial site and the relevant ethics committee. The linking of the trial site to the relevant ethics committee would also ensure that the correct ethics committee is responsible for overseeing the trial and providing a clear line of accountability. The reporting of the Adverse Drug Reaction (ADR), pharmacovigilance is an important part which should be considered while registration of the trial with an inclusion of names of ADR reporting center, peripheral pharmacovigilance reporting center details. The inclusion of points like preparation of drug from GMP- certified pharmacy, compliance of GCP guidelines would enhance the quality and reliability of CTRI and ensure that the registry remains an important tool for improving the transparency and accountability of clinical trials in India.

Positive outcomes have been observed in the dissemination efforts undertaken by the CTRI, resulting in an increase in the registration of new trials prospectively. As a result, modifications to the CTRI could enable the collection of more precise information regarding Ayurvedic interventions, leading to the establishment of proper research protocol standards. The Namaste portal, a newly developed database, compiles detailed information on the Ayurvedic system of medicine with terminologies and its qualitative data. These customized data set items in CTRI will aid in the enhancement and standardization of ongoing research in Ayurveda. ⁽¹⁸⁾ However, it should be acknowledged that these clinical studies do not always yield 100% conclusive results and thus, further research in this field of Ayurveda is essential. In addition, evidence and parametric-oriented research is currently in high demand within this field.

SWOT Analysis of the local Ayurvedic therapeutic procedures used in CTRI registered trials

Strength

Advanced technology in the form of spectacles, contact lenses, and refractive surgery is widely available, but it is not without

adverse effects and is not cost-effective for the general population. A strength identified from the registered studies is the diversity of Ayurvedic therapeutic approaches, including systemic and local ocular procedures. Ayurveda provides a holistic therapeutic framework that includes systemic and local ocular interventions. The Ayurvedic treatment of the eye includes specific therapies such as *Kriyakalpa* (therapeutic procedures for eye diseases), *Tarpan*, *Netradhara* (~therapeutic streaming over closed eyes from certain height), *Anjana*, *Aschyotana*, *Nasya*, *Ghratapana*. These procedures are traditionally described as supporting ocular tissue health, maintaining visual function, and promoting overall ocular health. The ancient Ayurvedic text *Sharangdhara* describes these procedures under the concept of *Netraprasadana*, referring to their traditionally described soothing or beneficial effect on the eyes. (19) The treatment procedures are comprehensive, including signs and symptoms observed when the procedures are properly done when done in a lesser manner, or in excess. Overall, *Kriyakalpa* represents a group of traditional Ayurvedic ocular therapeutic procedures that have been investigated in registered studies; however, their efficacy in refractive errors requires further evaluation through well-designed clinical studies.

Weakness

Due to the demands of the modern lifestyle, human eyes are subjected to a significant amount of stress. The *Kriyakalpa* procedures, require long-term follow-up in order to monitor symptoms and track progress. However, many patients require immediate relief of symptoms, which can be hindered by the limitations of the treatment. In addition, the need for avoiding certain activities during the treatment of refractive errors may lead to a high dropout rate among patients. The *Kriyakalpa* treatment, which includes Poorva (pre-treatment procedures), Pradhan (main treatment procedure), and Pashchat Karma (post treatment procedure), is a time-consuming procedure that may be perceived as poor time management by patients in today's fast-paced society. There are certain contraindications for this treatment, making it not suitable for all patients. One of the major concerns surrounding the *Kriyakalpa* treatment is the lack of standardization in its procedures. Potential limitations include the time and procedural requirements associated with certain *Kriyakalpa* procedures, the need for trained personnel, and variability in treatment protocols. These factors may influence feasibility and patient adherence and warrant evaluation in future prospective studies.

Opportunities

The treatment protocol should be designed to facilitate the treatment process. Techniques of *Kriyakalpa* should be modified to align with modern scientific principles, such as the use of goggles for Tarpan. Given the increasing burden of refractive errors in children, appropriately designed pediatric studies may be considered to evaluate the safety, feasibility and potential effectiveness of Ayurvedic interventions. To increase global accessibility and opportunities, there should be a concerted effort to promote *Kriyakalpa* on a global platform and make it more user-friendly.

Threats

The availability of scientific evidence to support the use of Ayurvedic medication for refractive errors is limited. There is no established dosage regimen for these medications and poor patient compliance has been reported. In addition, a high drop-out rate among patients receiving treatment is common. Long-term treatment options for refractive errors using classical Ayurvedic

medicines are also limited. Practitioners performing Ayurvedic procedures require a high level of expertise. Some practitioners have reported a lack of availability of students and therapists to assist in treatment. Therefore, further pragmatic studies on the use of Ayurvedic medication for refractive errors are needed in order to increase global awareness and opportunities for treatment

Conclusion

Clinical trials are considered the gold standard in the field of evidence-based medicine. The Clinical Trials Registry – India (CTRI) provides a national platform for prospective registration of clinical studies conducted in India, including studies evaluating Ayurvedic interventions. The use of platforms like Clinical Trials Registry of India (CTRI) plays an important role in improving transparency and preventing duplication of research efforts. The present review identified 28 CTRI-registered studies related to *Timira* and refractive errors, comprising both completed and ongoing studies with considerable heterogeneity in study designs, interventions, treatment duration, sample size, and other study characteristics. Variability and limitations in the information available in the registry records indicate the need for more complete and standardized reporting of clinical studies. Future research should focus on standardized Ayurvedic intervention protocols, adequately powered and methodologically rigorous clinical studies, and clearly defined objective ophthalmic and refractive outcome measures. These measures may help improve the comparability, quality, and clinical interpretability of evidence on Ayurvedic approaches to *Timira* and refractive errors.

Financial Support and funding

Nil

Conflict of interest

None to declare

Author Contributions

PB: Concept and design, ayurveda thought process, collection and analysis of data, review of manuscript, supervision, final approval
SP: Data management, writing the manuscript, collection of references

Data Statement

The extracted dataset is provided as supplementary material.

Declaration of AI in scientific writing

During the preparation of this work the author(s) used Chatgpt 3.5 for language editing purpose only and no authoritative/generative statements used from AI tool. After using this tool/service, the author(s) reviewed and edited the content as needed and take(s) full responsibility for the content of the publication.

References

1. Salunke AS, Kulkarni SS. Role of Panchakarma in treatment of Timira: Mode of action and contra-indications. Int J Ayurveda Pharma Res. 2020;49-56.
2. Bolke PS, Bhat PM. A conceptual study of Prathama and Dwitiya Patalagata Timira correlated with simple myopia. Int Ayurvedic Med J. 2020. Available from: http://www.iamj.in/posts/images/upload/3539_3543.pdf
3. Ambikadatta Shastri K. Sushrut Samhita. Uttartantra 7/7. Varanasi: Chaukhamba Sanskrit Sansthan; 2016:41.

4. Sheeladevi S, et al. Prevalence of refractive errors, uncorrected refractive error, and presbyopia in adults in India: A systematic review. *Indian J Ophthalmol*. 2019;67(5):583.
5. Vision impairment and blindness. World Health Organization [Internet]. [Accessed on 2026 Aug 9; 21:19 IST]. Available from: <https://www.who.int/news-room/fact-sheets/detail/blindness-and-visual-impairment>
6. McCarty CA, Taylor HR. Myopia and vision 2020. *Am J Ophthalmol*. 2000;129(4):525-527. doi:10.1016/S0002-9394(99)00444-4.
7. Khurana AK. *Comprehensive Ophthalmology*. 7th ed. New Delhi: Jaypee Brothers Medical Publishers; 2019:35-41.
8. Ambikadatta Shastri K. *Sushrut Samhita. Uttartantra 8/5*. Varanasi: Chaukhamba Sanskrit Sansthan; 2016:49.
9. Ambikadatta Shastri K. *Sushrut Samhita. Uttartantra 8/5*. Varanasi: Chaukhamba Sanskrit Sansthan; 2016:49-50.
10. Sridharan K, Sivaramakrishnan G. Clinical trials in Ayurveda: Analysis of clinical trial registry of India. *J Ayurveda Integr Med*. 2016;7(3):141-143
11. Santhakumari PK. *A textbook of ophthalmology in Ayurveda*. 2nd ed. Thiruvananthapuram; 2002:219-221.
12. Gupta DP, Rajagopala M, Dhiman KS. A clinical study on Akshitarpana and combination of Akshitarpana with Nasya therapy in Timira with special reference to myopia. *Ayu*. 2010 Oct;31(4):473-477.
13. Tripathi, KD, *Essentials of Medical Pharmacology*, 7th edn., New Delhi: Jaypee Brothers Medical Publishers (P) Ltd.; 2013:152
14. Gopinathan G, Dhiman KS, Manjusha R. A clinical study to evaluate the efficacy of Trataka Yoga Kriya and eye exercises (non-pharmacological methods) in the management of Timira (Ammetropia and Presbyopia). *Ayu*. 2012 Oct;33(4):543.
15. Vagbhata. *Ashtanga Hridaya with commentary by Arundatta and Hemadri*. In: Kunte AM, editor. *Sutrasthana, Ascyotananjana Vidhi Adhyaya 23, verse 1*. Reprint ed. Bombay: Nirnay Sagar Press; 1939:303
16. Stuvart D, J AM. Review on Aschyotana and eye drops. *Int J Ayush*. 2020;9(3):1-11.
17. Pillamarapu M, Mohan A, Saberwal G. An analysis of deficiencies in the data of interventional drug trials registered with Clinical Trials Registry-India. *Trials*. 2019 Aug 28;20(1):535.
18. Adhikari T, Rao MV, Srikanth N, Juneja A, Sharma S, Maulik M, Gupta J, Panchal Y, Rao BC, Khanduri S, Narayan RV. Overview of Ayurveda trials registered with Clinical Trial Registry-India: Need for customized data set items. *Ayu*. 2022 Feb 24;41(3):143.
19. Sharangdhara. *Sharangdhara Samhita*. In: Parashar AR, editor. *Uttar Khanda, Netraprasadan Kalpana Vidhi Adhyaya 13, verse 1*. 4th ed. Nagpur: Baidyanath Ayurved Bhavan; 1994:579.
