Study Protocol of a Prospective, Open-label, Single-arm, Clinical Trial to Evaluate the Efficacy of Classical Ayurveda Medicines in the Management of Vicharchika (Atopic Eczema)

Bhagwan Sahay Sharma¹, Bidhan Mahajon², Bhogavalli Chandra Sekhara Rao³, Narayanam Srikanth⁴

ABSTRACT

Background: In Ayurveda, Vicharchika (atopic eczema, AE) has been discussed under the heading of Kshudra Kustha. It is a variety of inflammatory skin disorders diagnosed as a chronic, widespread, noninfective inflammatory condition that causes severe pruritus, erythema with variable degree of exudates and scaling, which can impact at any age. The etiology of AE is complex and not fully understood. Although the traditional Ayurveda medicine is used as an alternative therapy for AE, available evidence relating to its effectiveness and mechanism are not fully implicit. Hence, a protocol of a prospective, multicenter, single-arm, open-label clinical trial using traditional Ayurveda medicine to investigate the effectiveness, mechanism, and safety for patients with Vicharchika (eczema) is being reported.

Materials and methods: This is a multicenter, single-arm, open-label clinical trial to evaluate the safety and efficacy of traditional Ayurveda formulations Panchatikta Ghrita and Nalpamaradi Taila in the management of Vicharchika (eczema). A total of 120 patients with Vicharchika (eczema) will be selected based on the inclusion and exclusion criteria. All the patients will be provided with classical Ayurvedic formulation, i.e., Panchatikta Ghrita 6 g orally twice daily before food and oil Nalpamaradi Taila 20 mL twice daily externally on the affected skin. Each participant will undergo a 12-week treatment period and a follow-up after 4 weeks. A total of seven visits will be scheduled for each participant: 1 visit each in week 0, week 2, week 4, week 6, week 8, week 10, and week 12. The primary outcome will be measured by the assessment of change in eczema area severity index (EASI) score before and after the recommended therapy. The secondary outcomes will be measured by—changes in clinical sign and symptoms per the Ayurvedic classics; changes in patient-oriented eczema measure (POEM) and changes in dermatology life quality index (DLQI) questionnaire. Therapeutic mechanism outcomes, safety outcomes, and end point outcomes will also be assessed.

Discussion: Protocol was designed with projected outcome as better clinical deliverables and safety profile in Vicharchika patients and reduced relapse rate of disease during post treatment period. If found effective, the selected drug will be listed in the management protocol of Vicharchika at clinical practice level in terms of better efficacy, safety, and cost-effective treatment. The selected drug may lead to a step ahead of better understanding and management of additional skin disorders.

Trial registration: Trial has been registered under clinical trials registry-India (CTRI); the registration number for this trial is CTRI/2019/12/022236.

Keywords: Ayurveda, Nalpamaradi taila, Panchatikta ghrita, Protocol, Vicharchika.


BACKGROUND

Skin diseases are increasing gradually nowadays due to distorted modern sedentary lifestyle of the individual along with ever-increasing environmental pollution.¹ In Ayurveda, Vicharchika to a greater extent resembles eczema. As defined by the World Allergy Organization (WAO), eczema (also known as atopic dermatitis) is a chronic, relapsing, and itchy inflammatory skin condition. In the acute stage, eczematous lesions are characterized by poorly defined erythema with surface change (as like edema, vesicles, and weeping). In the chronic stage, lesions are marked by skin thickening (lichenification).² About 50% of people suffering from eczema also become sensitized to environmental allergens, such as house dust mite, and may then be classified as having AE under the revised WAO nomenclature. The prevalence of AE is steadily increasing, currently ranging 1–20% of the general population. It may be caused by genetic factors and may be influenced by environmental factors. Most Vicharchika patients have a chronic, relapsing disease course characterized by remission and intermittent flares. Therefore, controlling symptoms of chronic Vicharchika is still challenging.³ The exact cause of AE is not known. Often it can be a difficult and frustrating condition. People with eczema do have the immunoglobulin E antibodies (IgE) produced by the immune system as part of allergic reactions.⁴ There is no definitive cure for eczema in contemporary medicine. The treatment line of eczema is anti-inflammatory topical treatments, antibiotics, skin barrier

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Source of support: Study has been conducted in peripheral research institute of Central Council for Research in Ayurvedic Sciences (CCRAS) under Intra Mural Research (IMR) projects.

Conflict of interest: None

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repair emulsion creams, oral steroids, and antihistamines. Besides, there are side effects and hence they are not very effective in the management of eczema. An effective Ayurvedic management of eczema is necessary. So in this study, Panchatikta Ghrita internally and Nalpamaradi Taila externally are taken up for clinical evaluation.

**Materials and Methods**

**Study Objective**

This a prospective, single-arm, open-label, interventional study designed to evaluate clinical safety and efficacy of Panchatikta Ghrita and Nalpamaradi taila in Vicharchika (AE) in a total of 120 patients. The action duration is set for 1 year.

**Design Overview**

The study design will assimilate rigorous existing clinical research methodology in accordance with the principles set out in the Good Clinical Practice (GCP) guidelines according to the theory that guides the appropriate use of traditional medicines in clinical practice. The rigorous design, organization, and conduct of the trial are supervised by a steering committee from the participating center in addition to the chairman, scientific coordinator, and statistician. This trial will be supported financially by the Central Council for Research in Ayurvedic Sciences (CCRAS), New Delhi, an autonomous body under Ministry of AYUSH, Government of India, under Intra Murral Research projects in Ayurvedic Sciences. A total of 120 participants will be recruited at Regional Ayurveda Research Institute for Skin Disorders, Vijayawada, the regional center under CCRAS. All the participants will undergo a 12-week treatment and a 4-week follow-up period. In this study, the period required for prestudy preparations such as staff recruitment, purchase of equipment, procurement of the trial drugs and necessary permission, etc., will be 3 months; the period which will be needed for execution of real work like enrollment of patients, laboratory work, survey, etc., will be 8 months; and the period that will be required for analyzing the data (usually after target is achieved) will be 1 month. The details are provided in Flowchart 1.

**Participants**

The study will enroll 120 patients who fulfill the following items of criteria in this trial.

**Assessment Criteria**

- Informed consent (during screening)
- Eligibility evaluation (based on Hanifin and Rajka criteria for atopic dermatitis/atopic eczema) (during screening)
- Laboratory investigations (during screening)
- General information—(personal identification and demographic profile) (during baseline)
- Medical history and general physical and systemic examination (during baseline)
- Physical examination and clinical assessment (during baseline and on 14th, 28th, 42th, 56th, 70th, 84th, and 112th day)
- Assessment of Ayurvedic parameters (Annexure I) (during baseline and on 14th, 28th, 42th, 56th, 70th, 84th, and 112th day)
- Assessing drug compliance (during baseline and on 14th, 28th, 42th, 56th, 70th, 84th, and 112th day)
- The eczema area severity index (EASI) score (during baseline and on 14th, 28th, 42th, 56th, 70th, 84th, and 112th day)
- Patient-oriented eczema measure (POEM) (during baseline and on 14th, 28th, 42th, 56th, 70th, 84th, and 112th day)
- The dermatology life quality index (DLQI) questionnaire score (during baseline and on 14th, 28th, 42th, 56th, 70th, 84th, and 112th day).

**Inclusion Criteria**

- Patients of either sex with age between 18 years and 60 years.
- Known cases of eczema (based on Hanifin and Rajka criteria for atopic dermatitis/atopic eczema)
- Willing to participate in the study.

**Exclusion Criteria**

- Patients with status eczematous condition
- Patients with poorly controlled hypertension (>160/100 mm Hg)
- Patients with uncontrolled diabetes mellitus having hemoglobin A1c (HbA1c) > 8%
- Patients on medication with corticosteroids, phototherapy, biologics, antidepressants, and any other drugs that may have an influence on the outcome of the study.
- Alcohol or drug abuser.
- Patients who have history of atrial fibrillation, acute coronary syndrome, myocardial infarction, stroke, or severe arrhythmia in the last 6 months
- Symptomatic patients with clinical evidence of heart failure
- Known cases of HIV and AIDS
- Known cases of malignancy
- Women who are planning for conception/pregnant or lactating
- Patients with concurrent serious hepatic disorders (defined as serum creatinine > 1.2 mg/dL), and severe pulmonary dysfunction (uncontrolled bronchial asthma and/or chronic obstructive pulmonary disease (COPD))
- History of hypersensitivity to any of the trial drugs or their ingredients
- Patients who have completed participation in any other clinical trial during the past 3 months
- Any other condition that the investigator thinks may jeopardize the study

**Handling of Withdrawal and Dropout**

- Voluntary withdrawal
- Loss of follow-up
- Poor compliance and presence of severe adverse effects
- Revealing and uncovering blind in urgency
- Misdiagnosis
- Using forbidden drugs or treatments in the course of the trial
- Taking no medication during the trial
- No evaluable records after medication
- Patient noncompliant with the study procedure (minimum 80% compliance is essential to continue in the study).

Reasons for participants withdrawing will be recorded in case record forms (CRFs), and the last data would be included in data analysis.

- Patient develops life-threatening complication or any other severe illness because of other pathology which requires urgent
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Flowchart 1: Study design and methods of assessment

**Intervention Details**

**Intervention-1:** *Panchatikta ghrita* (AFI-I, 6:26; API part-II, Vol-I) (Table 1).

**Intervention-2:** *Nalpamaradi taila* (AFI-I, 8:24; API part-II, Vol-III) (Tables 2 and 3).

**Drug Management**

The selected medicines will be prepared, respectively, and uniformly packaged. The package, drug name, function and indication, usage and dosage, storage condition, valid period and name of the manufacturer will be marked and a tag indicating “trial use” will be attached. Drugs will be kept in the appropriate temperature in a dry, shady, and cool place. Drug administrators would return unused drugs to estimate participant compliance and note these in the CRFs. Each intervention will be prepared according to the standards of good manufactory practice.

**Adverse Drug Event or ADR**

Any ADE or ADR, if observed during treatment period or during follow-up visits, will be clearly documented and its appropriate and timely management will be done. The investigator will report the same to the ethics committee and the sponsor(s) at the earliest.

**Drug Compliance**

If there is more than or equal to 80% compliance, the participant will be continued in the trial. The compliance needs to be assessed at each visit during the follow-up (i.e., day 14, 28, 42, 56, 70, and 84 day) by counting the number of empty pack bottles returned and assessing the approximate quantity of Ghrita and Taila consumed by the patient.

**Concomitant Medication**

Participants registered under the trial will be issued treatment cards with the entire treatment regimen written on it. They will be instructed to avoid the use of any other drugs on their own for any ailment and will be clearly instructed to consult the treating investigator for any symptom or complaint, or if they feel anything unusual. The investigator will record any medication(s) he/she may prescribe to alleviate their ailments.
To alleviate any emergency, the use of any rescue medication will be permitted per the discretion of the principal investigator. However, the same will be documented in appropriate column of the case record form.

**Secondary Outcome Measure**

Changes in clinical sign and symptoms as per the Ayurvedic classic, patient oriented eczema measures and DLQI questionnaire are included under the secondary outcome measure.

**Schedule of Data Collection**

All the selected cases for the study will be advised to have follow-up visits at 14 days' interval (i.e., on day 14, 28, 42, 56, 70, and 84) for 12 weeks followed by a posttreatment follow-up after 4 weeks, i.e., on 112th from the date of inclusion in the trial (Table 4).

**Details of Laboratory Investigations**

Patient will be investigated through laboratory investigations including hematological parameters and biochemical parameters including liver function test and kidney function test which would further be used to evaluate the safety of the interventions.

**Statistical Analysis**

Clinical symptoms, subjective parameters, and laboratory parameters will be subjected to univariate and multivariate analyses using Statistical Package for Social Sciences (SPSS) 20.0 version with appropriate statistical methods. An interim analysis, if required can be done when at least 25% participants have completed their trial period. Central Biostatistical Monitoring Unit of CCRAS, New Delhi.
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Table 4: Milestone with deliverables

<table>
<thead>
<tr>
<th>S. no.</th>
<th>Milestones</th>
<th>Deliverables</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>Pretrial preparations</td>
<td>Completion of all setup for patients including IEC clearance, drug procurement,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CRFs, necessary staff recruitment, lab investigation facilities, and other</td>
</tr>
<tr>
<td></td>
<td></td>
<td>required materials</td>
</tr>
<tr>
<td>2</td>
<td>Screening of the subjects</td>
<td>Informed consent, laboratory investigations</td>
</tr>
<tr>
<td>3</td>
<td>Baseline history</td>
<td>Demographic and medical history, clinical examination, assessment of Ayurvedic</td>
</tr>
<tr>
<td></td>
<td></td>
<td>and modern parameters, issue of trial drug and drug compliance report forms</td>
</tr>
<tr>
<td>4</td>
<td>During treatment period (i.e., on day 14, 28, 42, 56, and 70)</td>
<td>Clinical examination, assessment of Ayurvedic and modern parameters, concomitant medication, rescue medication, assessment of ADRs/ADEs, assessment of drug compliance, issue of trial drug and drug compliance report forms</td>
</tr>
<tr>
<td>5</td>
<td>At the end of treatment, i.e., at the end of 12 weeks (day 84)</td>
<td>Laboratory investigations, clinical examination, assessment of Ayurvedic and modern parameters, concomitant medication, rescue medication, assessment of ADRs/ADEs, assessment of drug compliance report forms</td>
</tr>
<tr>
<td>6</td>
<td>Posttreatment period assessment, i.e., at the end of 16 weeks (day 112)</td>
<td>Clinical examination, assessment of Ayurvedic and modern parameters, assessment on relapse of disease</td>
</tr>
</tbody>
</table>

and the Research Officers who are directly involved in this project will monitor the progress of the trial through regular site visits. All information regarding clinical trial will be properly documented and stored in order to ensure its accurate interpretation and verification. Analysis will be done after completion of the trial.

Deviation from the Protocol

The trial will be conducted in compliance with the protocol. Deviations from the protocol will not be made except when necessary to alleviate an immediate hazard to trial patients. All deviations from the protocol, including unplanned changes to interventions, examinations, data collection, and method of analysis will be reported to the sponsors and Institutional Ethical Committee (IEC) at the earliest along with the exact reason for the deviation.

Ethical Considerations

The trial will be conducted in accordance with the ethical principles that have their origin in the Declaration of Helsinki for biomedical research and Indian Council of Medical Research (ICMR) National Ethical Guidelines for Biomedical Research involving Human Participants (2017) and that are consistent with Indian/International Conference on Harmonisation of Technical Requirements for Registration of Pharmaceuticals for Human Use (ICH) GCP guidelines/GCP guidelines for clinical trials in Ayurveda, Siddha, Unani (ASU) Medicine (2013). Prior to the commencement of the trial, the protocol, the participant information sheet, and the consent form will be submitted to the institutional ethics committee. Written approval of the same must be obtained from the IEC. Protocol amendments are also to be approved by the IEC according to the usual procedure.

Patient Information Sheet and Consent Form

Prior to any trial-related activity, the investigator will give the patient verbal and written information about the trial in a form that the participant can read and understand. The investigator will ensure that the participant is fully informed about the aims, procedures, discomforts, and expected benefits of the trial. It must be emphasized that participation is voluntary and participants have the right to opt out of the trial at any time without any prejudice. A voluntary, signed witnessed informed consent should be obtained from the participant prior to any clinical trial-related procedure. A consolidated amount of Rs. 100 per visit during enrollment and then on follow-up day will be specified.

Discussion

In Ayurveda, Vicharchika to a greater extent resembles eczema. Vicharchika has been discussed under the heading of Kshudra Kushta both by Acharya Charaka and by Acharya Sushruta. Ayurveda classics have described that Vicharchika has Kapha-Vata predominance and comes under Raktrapradoshajya Vikara (disorder occurring due to vitiation of blood). The general causative factors described here are intake of mutually contra-indicative foods, suppression of natural urges, intake of uncooked food, transgression of the prescribed order with reference to heat and cold, etc. The symptoms described in Samhita are blackish brown eruptions associated with itching sensation and excessive exudation. As defined by the WAO revised nomenclature in 2003, eczema (also known as atopic dermatitis) is a chronic, relapsing, and itchy inflammatory skin condition. About 50% of people suffering from eczema also become sensitized to environmental allergens, such as house dust mite, and may then be classified as having AE under the revised WAO nomenclature. Atopic eczema is a chronic, relapsing, pruritic, inflammatory eczematous eruption that usually starts in early life. The exact causes of eczema are unknown. There is a tendency that eczema is inherited. Abnormal immune function is one of the causes. Most of the environmental factors will trigger eczema. In Ayurveda, it has been mentioned as a curable disease; but due to relapsing nature of the disease and hazardous side effects of the modern drugs, it is difficult to manage sometimes. Both the selected traditional Ayurveda medicines, Panchatikta Ghrita and Nalpamaradi Taila, are effectively used in the skin disorders for a very long time now. Nalpamaradi Taila mentioned in Sahasrayoga tailaprikaran is used in itching and scabies, visarpa (erysipelas), and kushta (skin disease/leprosy). On the other hand, Panchatikta Ghrita mentioned in Bhaishajyaratnavali, kusthadhikara indicated in dustavara (nonhealing ulcer), kushta (skin diseases), vatavayadi (disorders due to vitiation of Vata), Pittavayadi (disorders due to vitiation of Pitta), kaphavikara (disorders due to vitiation of kapha), krimi (worm infestation), Arsha (piles), and kasa (cough), Protocol designed with desired outcome and safety profile in the treatment of Vicharchika patients along with reduced relapse rate of disease during post treatment period. If found effective, the selected drug will be listed in the management protocol of Vicharchika at clinical practice level in terms of better efficacy, safety, and cost-effectiveness treatment. The selected drug may lead to a step ahead of better understanding and management of additional skin disorders.
Trial Status
At the time of manuscript submission, procurement of the intervention for the trial has been finished and enrollment of the participants is ongoing.

References

Annexure I: Ayurvedic parameters for assessment of Vicharchika

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Scoring that can be given</th>
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<tbody>
<tr>
<td><strong>Kandu</strong> (itching)</td>
<td>0—none</td>
</tr>
<tr>
<td></td>
<td>1—mild</td>
</tr>
<tr>
<td></td>
<td>2—moderate</td>
</tr>
<tr>
<td></td>
<td>3—severe</td>
</tr>
<tr>
<td><strong>Pidaka</strong> (papular eruptions)</td>
<td>0—absent</td>
</tr>
<tr>
<td></td>
<td>1—present</td>
</tr>
<tr>
<td><strong>Srava</strong> (excessive/copious discharge)</td>
<td>0—none</td>
</tr>
<tr>
<td></td>
<td>1—Alpa (mild)</td>
</tr>
<tr>
<td></td>
<td>2—Na Alpa, Naatibahula (moderate)</td>
</tr>
<tr>
<td></td>
<td>3—Bahusrava (copious)</td>
</tr>
<tr>
<td><strong>Shyavavarna</strong> (blackish discoloration/hyperpigmentation)</td>
<td>0 = normal skin color without hyperpigmentation</td>
</tr>
<tr>
<td></td>
<td>1 = barely visible hyperpigmentation</td>
</tr>
<tr>
<td></td>
<td>2 = mild hyperpigmentation</td>
</tr>
<tr>
<td></td>
<td>3 = moderate hyperpigmentation</td>
</tr>
<tr>
<td></td>
<td>4 = severe hyperpigmentation</td>
</tr>
<tr>
<td><strong>Raji</strong> (fissures on skin)</td>
<td>0—absent</td>
</tr>
<tr>
<td></td>
<td>1—present</td>
</tr>
<tr>
<td><strong>Atiruja</strong> (pain)</td>
<td>0—none</td>
</tr>
<tr>
<td></td>
<td>1—alpa (mild)</td>
</tr>
<tr>
<td></td>
<td>2—Na Alpa, Naatibahula (moderate)</td>
</tr>
<tr>
<td></td>
<td>3—Atiruja (severe)</td>
</tr>
<tr>
<td><strong>Ruksha</strong> (dryness)</td>
<td>0—normal skin</td>
</tr>
<tr>
<td></td>
<td>1—mild</td>
</tr>
<tr>
<td></td>
<td>2—moderate</td>
</tr>
<tr>
<td></td>
<td>3—severe dryness with exfoliation</td>
</tr>
</tbody>
</table>
हिंदी सारांश

विचित्रिका की चिकित्सा में शास्त्रीय औषधियों का प्रभावात्मक मूल्यांकन हेतु एक प्रोस्पेक्टिव, औपन-लेबल, सिंगल-आर्म, आलूरिय परीक्षण का अध्ययन प्रोटोकॉल

विधान महाजन, भगवान सहाय शर्मा, भोगवल्ली चंदवेल राव, नारायणम श्रीकांत

पृष्ठभूमि: आयुर्वेद में विचित्रिका (एटोपिक एकज़मा) रोग का वर्गन 'शुद्धकुमा' शर्यक रोग में है। विचित्रिका त्वचा विकारों का एक प्रकार है; यह एक पुरानी, त्वचा, गैर-संक्रामक विषमति के रूप में प्रकार होता है, जिसमें गंधों अल्लाद एफेमा, एक्सोटेक्ट्स और स्केलिंग बनता है, जो किसी भी दस में प्रभाव डाल सकता है। एटोपिक एकज़मा का निदान कठिन है, जो अधिक भी पूरी तरह से समझ में नहीं आया है। यहूद, पारंपरिक आयुर्वेद चिकित्सा का उपयोग एटोपिक एकज़मा के लिए एक दैनिक चिकित्सा के रूप में किया जाता है, लेकिन इसकी प्रभावशीलता और शारीरिक संबंधित प्रामाणिकता पूरी तरह से उपलब्ध नहीं है। यहाँ हम विचित्रिका (एकज़मा) के रोगियों के लिए पारंपरिक आयुर्वेद चिकित्सा का प्रभावात्मकता, और सुरक्षा की आंक करने के लिए एक औपन-लेबल, सिंगल-आर्म, नैदानिक परीक्षण का प्रोटोकॉल को प्रस्तुत करते हैं।

विधियाँ: यह एक प्रोस्पेक्टिव, सिंगल-आर्म, औपन-लेबल नैदानिक परीक्षण है, जो कि आयुर्वेद परम्परा में विचित्रिका (एकज़मा) रोग की चिकित्सा में पंचविनत्तवृत्ति और नालापारादि तेल की सुरक्षा एवं प्रभावात्मकता का मूल्यांकन करता। अध्ययन में कुल 120 विचित्रिका (एकज़मा) रोगियों को चिकित्सा एवं बहिष्करण मानदंडों के आधार पर शामिल किए जाएगा। सभी रोगियों को आयुर्वेद चिकित्सा यानि पंचविनत्तवृत्ति 6 ग्राम, मौखिक रूप से दिन में दो बार, भोजन से पहले और नालापारादि तेल 20 मिली, दो बार, बाहरी रूप से प्रभावित त्वचा पर उपचारित किया जाएगा। प्रत्येक प्रतिमागी के लिए 12 सप्ताह का उपचार और 4 सप्ताह का अनुसंधान अधिक होगा। प्रत्येक प्रतिमागी के लिए सात विजिट का समय निर्धारित होगा यथा सप्ताह 0, सप्ताह 2, सप्ताह 4, सप्ताह 6, सप्ताह 8, सप्ताह 10 और सप्ताह 12 में। प्राथमिक परीक्षण अनुशंसित चिकित्सा से पहले और बाद में ई.ए.एस.एम. सेवेटिट इंडिक्स स्कोर से आकलन किया जाएगा। दूसरी परीक्षण को आयुर्वेदिक मापदंडों के अनुसार नैदानिक संकेत और लक्षणों में परिवर्तन का अकलन किया जाएगा; पैकेट ओरिएंटेड एकेजिया मीजर (POEM) एवं इंडाईजीजी लाइफकास्ट इंडिक्स स्केव्यर्नियर (DLQI) में परिवर्तन; देखा जाएगा। विचित्रिकीय परीक्षण, सुरक्षा परीक्षण और समापन विद्वान परीक्षणों का भी मूल्यांकन किया जाएगा।

चर्चा: विचित्रिका के रोगियों में बेहतर नैदानिक परीक्षण और सुरक्षा प्रोफाइल के रूप में अनुमानित प्रोटोकॉल के साथ डिजाइन किया गया उपचार विचित्रिका रोग को दूर करने में सफल भूमिका निभा सकती है। यदि प्रभावी पाया जाता है तो चर्चित तार को बेहतर प्रभावात्मकता के रूप में विचित्रिका उपचार के संदर्भ में सुधीरवृद्धि किया जाएगा। चर्चित तर अंतरिक्ष त्वचा विकारों के बेहतर विकित्सा में महत्वपूर्ण भूमिका के साथ आगे जा सकता है।

परीक्षण पंजीकरण: परीक्षण को विकित्सा परीक्षण हेतु CTRI के तहत पंजीकृत किया गया है; इस परीक्षण के लिए पंजीकरण संख्या CTRI / 2019/12/022236 है।

शब्दों में: आयुर्वेद, नालापारादि तेल, पंचविनत्तवृत्ति, प्रोटोकॉल, विचित्रिका।