



RESEARCH ARTICLE

EFFECT OF NATUROPATHIC BASED INTERVENTION ON FUNGAL INFECTION: A SINGLE CASE STUDY

Dr. Baby Shalini, D¹., Dr. Anusha. R²., Dr. Priya P³., Dr. Allwin Christuraj, P⁴., Kaaviyaa, K⁵. and Anaslin Jenisha, Devi, V⁶.

¹Professor, Department of Pathology, Sree Ramakrishna Medical College of Naturopathy & Yogic Sciences, Kulasekharam, Tamil Nadu, India ; ²Professor, Department of Naturopathy, Sree Ramakrishna Medical College of Naturopathy & Yogic Sciences, Kulasekharam, Tamil Nadu, India ; ³Professor, Department of Community medicine, Sree Ramakrishna Medical College of Naturopathy & Yogic Sciences, Kulasekharam, Tamil Nadu, India ; ⁴Professor, Department of Manipulative Therapy, Sree Ramakrishna Medical College of Naturopathy & Yogic Sciences, Kulasekharam, Tamil Nadu, India ; ^{5,6}Student, Sree Ramakrishna Medical College of Naturopathy & Yogic Sciences, Kulasekharam, Tamil Nadu, India

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*Corresponding author:
Dr. Baby Shalini.D

ABSTRACT

Fungal infections are among the most common dermatological disorders, causing itching, erythema, scaling, and discomfort that can impair quality of life. Although antifungal medications remain the standard treatment, complementary naturopathic interventions may provide supportive benefits. This study evaluated the clinical outcomes of an integrated naturopathic treatment protocol in a patient with a localized fungal infection. **Methods:** A single-case experimental study was conducted over 32 consecutive days in a patient with a clinically diagnosed localized fungal infection accompanied by itching and mild pain. The intervention included a neutral hip bath with epsom salt and turmeric powder, acupuncture, chromotherapy using blue and green light, a therapeutic diet, and supportive naturopathic procedures. Primary outcomes were changes in lesion dimensions, while itching severity was assessed using the Worst Itch Numeric Rating Scale (WI-NRS). Clinical progress was monitored through serial assessments and image documentation. **Results:** Progressive clinical improvement was observed following the 32-day intervention. The primary lesion reduced from approximately 8.0 × 5.5 cm at baseline to 3.0 × 2.5 cm at follow-up, while the inferior round lesion decreased from approximately 2.5 cm to 1.5 cm in diameter. The overall affected surface area appeared to decrease by an estimated 60-80%. Itching and pain were markedly reduced, with only minimal residual irritation at the end of treatment. The lesion also appeared less erythematous and less well defined, suggesting partial clinical regression. **Conclusion:** This single-case study suggests that an integrated naturopathic treatment protocol was associated with improvements in lesion size, itching, and pain in a localized fungal infection. Larger randomized controlled trials with standardized outcome measures and long-term follow-up are needed to determine the efficacy, safety, and clinical applicability of these complementary interventions.

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INTRODUCTION

Fungal infections, also known as mycoses, are diseases caused by pathogenic fungi that affect the skin, nails, hair, mucous membranes, or internal organs. Fungi are eukaryotic microorganisms that exist as yeasts, molds, or dimorphic forms and are widely distributed in the environment. While many fungal species are harmless, some become pathogenic under favorable conditions, particularly in individuals with weakened immunity or underlying medical conditions (Kohler *et al.*, 2017). Fungal infections are classified into superficial, cutaneous, subcutaneous, and systemic mycoses according to the depth of tissue involvement. Superficial and cutaneous infections, such as ringworm and athlete's foot, are highly

prevalent, whereas systemic infections caused by organisms such as *Candida*, *Aspergillus*, and *Cryptococcus* can be life-threatening, especially in immunocompromised individuals (World Health Organization [WHO], 2022). Several factors predispose individuals to fungal infections, including diabetes mellitus, prolonged use of antibiotics or corticosteroids, immunosuppressive therapy, poor personal hygiene, and exposure to warm and humid environments. Clinical manifestations commonly include itching, erythema, scaling, skin discoloration, and nail changes. Diagnosis is based on clinical evaluation supported by laboratory investigations such as potassium hydroxide (KOH) microscopy, fungal culture, and histopathological examination (Kohler *et al.*, 2017).

Conventional treatment mainly involves topical or systemic antifungal agents. However, complementary approaches are increasingly being explored to improve symptom management and overall well-being. The present case study aims to evaluate the outcomes of a structured naturopathic treatment protocol comprising a neutral hip bath with epsom salt and turmeric powder, acupuncture therapy, chromotherapy, and a therapeutic diet in reducing fungal infection and associated itching.

METHODOLOGY

Study Design: This study employed a single-case experimental design to evaluate the effects of a structured naturopathic intervention in the management of a fungal infection. The intervention was administered over a period of 32 consecutive days, during which changes in the size of the fungal lesion and the severity of itching were systematically monitored. The study was designed to assess the clinical response to an integrated naturopathic treatment protocol through repeated outcome measurements.

Participant: A patient clinically diagnosed with a localized fungal infection accompanied by itching and mild pain was enrolled in the study. Verbal informed consent was obtained from the participant before the initiation of the intervention. The participant was informed about the nature, purpose, and expected outcomes of the study, and confidentiality was maintained throughout the research process.

Intervention Protocol: The patient underwent an organized naturopathic treatment regimen that included chromotherapy, acupuncture, a neutral hip bath with epsom salt and turmeric powder, and a therapeutic diet. The intervention was administered daily for 32 consecutive days. The treatment protocol was designed to improve local circulation, support the body's natural healing mechanisms, reduce inflammation and itching, promote tissue repair, and facilitate the resolution of the fungal infection.

Outcome Measures: The primary outcome measure was the size of the fungal lesion, assessed by measuring its length, width, and depth using standard clinical measurement techniques. The secondary outcome measure was the intensity of itching, evaluated using the Worst Itch Numeric Rating Scale (WI-NRS), a validated instrument for assessing pruritus severity.

Data Collection and Analysis: Baseline assessments were performed before the commencement of treatment. Measurements of the fungal lesion and WI-NRS scores were recorded at baseline and monitored regularly throughout the 32-day intervention period. Changes in lesion size and itching severity were analyzed using descriptive methods to evaluate the clinical effectiveness of the structured naturopathic intervention.

INTERVENTION

Treatment Protocol

Enema: An enema is commonly used to relieve severe constipation or to prepare the bowel before certain medical procedures. **Neutral hip bath with epsom salt and turmeric**

powder: A neutral hip bath with epsom salt and turmeric powder is commonly used to promote relaxation, reduce discomfort, and improve pelvic circulation.

Mud pack on the abdomen: A mud pack applied to the abdomen is commonly used to relieve abdominal discomfort, improve digestion, and provide a cooling effect.

Chromotherapy (blue and green light): Chromotherapy using blue and green light is commonly used with the aim of reducing stress, improving mood, and promoting relaxation. Blue light on fungal infection has demonstrated antifungal activity in research studies. It works by stimulating the production of reactive oxygen species which damage the fungal cell membrane, protein and DNA, thereby, inhibiting fungal growth. Green light has very limited direct antifungal effects instead of killing fungi, it is mainly known for its ability to reduce inflammation, relieve pain and promote wound healing.

Acupuncture therapy: Acupuncture therapy is commonly used for pain management, including chronic back pain and knee osteoarthritis. Points included, LI11, Sp9, Sp6, St36, Liv3.

DIET

Diet Protocol: The standardized weekly meal plan was used as a dietary intervention for individuals with fungal infection to support overall health, immune function, and recovery. The menu included balanced meals comprising whole grains, pulses, legumes, vegetables, fruits, dairy products, and fermented foods, providing adequate macronutrients and essential micronutrients. Daily consumption of amla juice was included as a source of vitamin C and antioxidants, while a variety of vegetables and legumes contributed dietary fiber, vitamins, minerals, and phytochemicals. The meal plan emphasized freshly prepared, nutrient-dense foods and limited highly processed, sugar-rich, and deep-fried foods, thereby promoting a balanced diet that supports nutritional status and general well-being during the management of fungal infection.

RESULTS

Table 3 shows, following a routine of taking a neutral hip bath with epsom salt and turmeric powder, acupuncture therapy, chromotherapy, and a therapeutic diet. The prognosis is on the initial day of having severe itching and pain. After 32 days of treatment in naturopathy with minimal irritation or pain, with reduced infection.

DISCUSSION

This single-case study demonstrated a progressive reduction in the size of the fungal lesion, itching severity, and pain following a 32-day structured naturopathic intervention consisting of a neutral hip bath with epsom salt and turmeric powder, acupuncture therapy, chromotherapy, and a therapeutic diet. By the end of the intervention, the participant experienced marked clinical improvement, with minimal irritation and pain and a noticeable reduction in the extent of the fungal infection. The observed improvement may be attributed to the combined effects of the integrated intervention rather than any single modality. The neutral hip bath may have promoted local circulation, enhanced skin hygiene, and

Table 1. Shows, the treatment protocol

[illegible]

Table 2 shows the diet chart

DAY	8-AM	11 AM	1 PM	3 PM	7 PM
1	Upma with coconut chutney	Amla juice	Rice-sambar, White chickpea gravy, Bean poriyal (fry)	Vegetable Salad with spices	Idly-coconut chutney
2	Dosa with tomato chutney	Amla juice	Dal rice, aviyal, Cucumber, Curd stew	Steamed rajma with grated coconut	Porridge-coconut chutney
3	Appam-potato gravy	Amla juice	Rice-rasam, Carrot fry, Cabbage fry	Black tea with green gram sprouts	Chapathi-vegetable gravy
4	Dosa-sambar, Groundnut chutney	Amla juice	Rice-curd, beetroot fries	Ragimalt- wheat biscuit	Appam-veg curry
5	Idly-sambar, Tomato chutney	Amla juice	Dal rice, rajma stir fry	Fruit salad	Idiyappam-black chickpeas curry
6	Dosa-coconut chutney	Amla juice	Rice-sambar, Beans fries, Soya chunks fries	Vegetable salad with curd	Idly-groundnut chutney
7	Appam with black chickpea gravy	Amla juice	Pulao-vegetable gravy , raita	Aval with grated coconut	Idly- tomato chutney
8	Upma with coconut chutney	Amla juice	Rice-sambar, White chickpea gravy, Bean poriyal(fry)	Vegetable Salad with spices	Idly-coconut chutney
9	Dosa with tomato chutney	Amla juice	Dal rice, aviyal, Cucumber, Curd stew	Steamed rajma with grated coconut	Porridge-coconut chutney
10	Appam-potato gravy	Amla juice	Rice-rasam, Carrot fry, Cabbage fry	Black tea with green gram sprouts	Chapathi-vegetable gravy
11	Dosa-sambar, Groundnut chutney	Amla juice	Rice-curd, beetroot fries	Ragimalt- wheat biscuit	Appam-veg curry
12	Idly-sambar, Tomato chutney	Amla juice	Dal rice, rajma stir fry	Fruit salad	Idiyappam-black chickpeas curry
13	Dosa-coconut chutney	Amla juice	Rice-sambar, Beans fries, Soya chunks fries	Vegetable salad with curd	Idly-groundnut chutney
14	Appam with black chickpea gravy	Amla juice	Pulao-vegetable gravy , raita	Aval with grated coconut	Idly- tomato chutney
15	Upma with coconut chutney	Amla juice	Rice-sambar, White chickpea gravy, Bean poriyal(fry)	Vegetable Salad with spices	Idly-coconut chutney
16	Dosa with tomato chutney	Amla juice	Dal rice, aviyal, Cucumber, Curd stew	Steamed rajma with grated coconut	Porridge-coconut chutney
17	Appam-potato gravy	Amla juice	Rice-rasam, Carrot fry, Cabbage fry	Black tea with green gram sprouts	Chapathi-vegetable gravy
18	Dosa-sambar, Groundnut chutney	Amla juice	Rice-curd, beetroot fries	Ragimalt- wheat biscuit	Appam-veg curry
19	Idly-sambar, Tomato chutney	Amla juice	Dal rice, rajma stir fry	Fruit salad	Idiyappam-black chickpeas curry
20	Dosa-coconut chutney	Amla juice	Rice-sambar, Beans fries, Soya chunks fries	Vegetable salad with curd	Idly-groundnut chutney
21	Appam with black chickpea gravy	Amla juice	Pulao-vegetable gravy , raita	Aval with grated coconut	Idly- tomato chutney
22	Upma with coconut chutney	Amla juice	Rice-sambar, White chickpea gravy, Bean poriyal(fry)	Vegetable Salad with spices	Idly-coconut chutney
23	Dosa with tomato chutney	Amla juice	Dal rice, aviyal, Cucumber, Curd stew	Steamed rajma with grated coconut	Porridge-coconut chutney
24	Appam-potato gravy	Amla juice	Rice-rasam, Carrot fry, Cabbage fry	Black tea with green gram sprouts	Chapathi-vegetable gravy
25	Dosa-sambar, Groundnut chutney	Amla juice	Rice-curd, beetroot fries	Ragimalt- wheat biscuit	Appam-veg curry
26	Idly-sambar, Tomato chutney	Amla juice	Dal rice, rajma stir fry	Fruit salad	Idiyappam-black chickpeas curry
27	Dosa-coconut chutney	Amla juice	Rice-sambar, Beans fries, Soya chunks fries	Vegetable salad with curd	Idly-groundnut chutney
28	Appam with black chickpea gravy	Amla juice	Pulao-vegetable gravy , raita	Aval with grated coconut	Idly- tomato chutney
29	Upma with coconut chutney	Amla juice	Rice-sambar, White chickpea gravy, Bean poriyal(fry)	Vegetable salad with spices	Idly-coconut chutney
30	Dosa with tomato chutney	Amla juice	Dal rice, aviyal, Cucumber, Curd stew	Steamed rajma with grated coconut	Porridge-coconut chutney
31	Appam-potato gravy	Amla juice	Rice-rasam, Carrot fry, Cabbage fry	Black tea with green gram sprouts	Chapathi-vegetable gravy
32	Dosa-sambar, Groundnut chutney	Amla juice	Rice-curd, beetroot fries	Ragimalt- wheat biscuit	Appam-veg curry

Table 3 shows the WI-NRS and Pain/Irritation Score

Day	Clinical Features	WI-NRS	Pain/ Irritation (0-10)
1	Borders clearly visible with severe Itching.	8	8
2	Borders clearly visible with severe Itching.	8	8
3	Borders clearly visible with severe Itching.	8	8
4	Borders clearly visible with severe Itching.	8	8
5	Borders clearly visible with severe Itching.	8	8
6	Borders clearly visible with severe Itching.	8	8
7	Itching and irritation slightly reduced	7	6
8	Itching and irritation slightly reduced	7	6
9	Itching and irritation slightly reduced	7	6
10	Itching and irritation slightly reduced	7	6
11	Itching and irritation slightly reduced	7	6
12	Itching and irritation slightly reduced	7	6
13	Itching and irritation slightly reduced	7	6
14	Itching and irritation slightly reduced	7	6
15	Itching and irritation slightly reduced	7	6
16	Itching and irritation slightly reduced	7	6
17	Color changes begin and itching still persists	6	4
18	Color changes begin and itching still persists	6	4
19	Itching still persists	6	4
20	Further reduction in symptoms	6	4
21	Stable improvement. Itching slightly reduced	5	4
22	Reduced itching and irritation	5	4
23	Reduced itching and irritation	5	4
24	Reduced itching and irritation	5	4
25	Reduced itching and irritation	5	4
26	Further reduction in symptoms and size	3	3
27	Reduction in symptoms and size	3	3
28	Reduced itching and irritation and size still reduced	3	3
29	Stable improvement	2	3
30	Stable improvement.	2	2
31	Slight Itching and irritation	2	2
32	Slight Itching persists	2	2

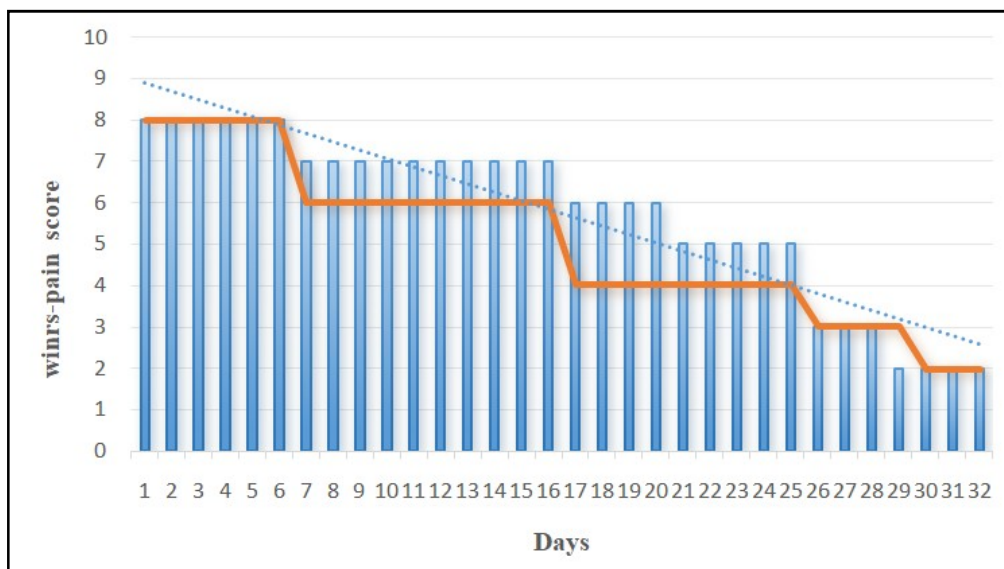


Fig. 1. Shows, the pruritis, pain/irritation score

provided symptomatic relief. Turmeric contains curcumin, a bioactive compound that has demonstrated anti-inflammatory, antioxidant, and antifungal properties in experimental studies, which may have contributed to the reduction in local inflammation and fungal burden (Hewlings & Kalman, 2017). Although epsom salt is traditionally used to relieve discomfort and promote relaxation, there is limited clinical evidence supporting its direct antifungal activity, and its role in this case is likely to have been supportive rather than therapeutic. Acupuncture may have contributed to symptomatic relief by modulating pain pathways, improving local blood circulation, and regulating inflammatory responses. Previous studies have reported that acupuncture can reduce pruritus and improve

quality of life in patients with chronic dermatological disorders, although evidence regarding its effectiveness specifically for fungal infections remains limited (Kim *et al.*, 2019). Therefore, its primary contribution in the present case is likely to have been the alleviation of itching and pain rather than direct inhibition of fungal growth. Chromotherapy was included as an adjunctive modality. Experimental evidence suggests that blue light exhibits antimicrobial and antifungal activity by stimulating the production of reactive oxygen species, which can damage fungal cell membranes, proteins, and nucleic acids. In contrast, green light has minimal direct antifungal effects but has been associated with anti-inflammatory, analgesic, and wound-healing properties that



Fig. 2. Shows, before and after the treatment

may support tissue recovery. Nevertheless, high-quality clinical evidence supporting chromotherapy in the treatment of fungal infections remains insufficient, and its therapeutic role requires further investigation. The therapeutic diet may also have supported clinical recovery by improving nutritional status and immune function. Adequate intake of vitamins, minerals, antioxidants, dietary fiber, and phytochemicals from fruits, vegetables, legumes, and whole grains is known to support immune responses and tissue repair (Calder, Carr, Gombart, & Eggersdorfer, 2020). Daily consumption of amla juice may have further enhanced antioxidant status because of its high vitamin C content, while reducing processed and sugar-rich foods may have supported overall metabolic and skin health. Compared with the baseline image, the follow-up image demonstrates an apparent reduction in lesion size. The lesion appears to have decreased from approximately 8.0×5.5 cm to 3.0×2.5 cm, while the diameter of the inferior round lesion appears to have decreased from approximately 2.5 cm to 1.5 cm, consistent with partial clinical regression. The largest plaque appears shorter and narrower, and the previously distinct inferior round lesion is smaller and less well defined. Overall, the involved surface area appears to have decreased by approximately 60-80%. The findings of this case are consistent with the concept that complementary naturopathic interventions may improve symptom control and patient comfort when used alongside conventional management. However, the observed improvement cannot be definitively attributed to the intervention because the study involved only a single participant without a control group. Future studies should employ randomized controlled trial designs with larger sample sizes, standardized outcome measures, microbiological assessments, and long-term follow-up to establish the efficacy and safety of integrated naturopathic interventions as complementary approaches in the management of fungal infections.

CONCLUSION

This single-case study suggests that a structured naturopathic treatment protocol comprising a neutral hip bath with epsom salt and turmeric powder, acupuncture therapy, chromotherapy, a therapeutic diet, along with supportive naturopathic procedures, was associated with a reduction in the severity of a localized fungal infection over a 32-day

intervention period. The participant demonstrated a progressive decrease in lesion size, itching, and pain, resulting in minimal irritation and marked clinical improvement by the end of the treatment. The integrated intervention may have contributed to symptom relief through its combined effects on local circulation, inflammation, tissue repair, nutritional status, and overall well-being. Further, well-designed randomized controlled trials with larger sample sizes, standardized clinical long-term follow-up are required to establish the efficacy, safety, and clinical applicability of integrated naturopathic interventions in the management of fungal infections.

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