

## Clinical Research

# Clinical efficacy of *Shodhana Karma* and *Shamana Karma* in *Mandala Kushtha* (Psoriasis)

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## Abstract

In India an estimated 0.8% of the population is suffering from Psoriasis. It is a papulo-squamous disorder of the skin, characterized by sharply defined erythematous-squamous lesions. It is chronic and is well known for its course of remissions and exacerbations. The exact etiology is still unknown. This condition is comparable with *Mandala Kushtha* in Ayurvedic system of medicine. *Shodhana* procedures are reliable to control the disease. Forty patients, fulfilling the inclusion criteria, were selected and randomly divided into four groups with 10 patients in each group. In Group A, *Vamana* and *Virechana* was administered once during the trial period. In Group B, *Vamana* and *Virechana* followed by Dermo-care in the dose of 5 g twice a day for the period of 2 months. In Group C, only Dermo-care was administered. In Group D, Tab. Neotrexate (Methotrexate) 7.5 mg/week was given under the supervision of dermatologist. Marked improvement was observed in 10% of the patients in Group B. Moderate improvement was observed in 20% of the patients in Group A, 90% in Group B, and 80% in Group D. Mild improvement was observed in 80% of the patients in Group A, 100% in Group C, and 20% in Group D.

**Key words:** *Mandala Kushtha*, Psoriasis, *Shamana*, *Shodhana*, *Vamana*, *Virechana*

## Introduction

In Ayurveda all skin diseases are categorized under "*Kushtha*". *Mandala Kushtha* a type of *Maha Kushtha* is a chronic of *Kushtha*. Even if it is cured relapses are common. *Mandala Kushtha* is stated to be *Tridoshaja* with the dominance of *Kapha Dosha*. The description and characteristic features of *Mandala Kushtha* are nearer to Psoriasis. Hence, *Mandala Kushtha* can be compared with Psoriasis.

Psoriasis is chronic and well known for its course of remissions and exacerbations. Modern medical science treats psoriasis with spiraled (P) and ultraviolet A (UVA) therapy PUVA, corticosteroids, and antimitotic drugs. But these therapies are associated with serious side effects like liver and kidney failure, bone marrow depletion, etc.<sup>[1,2]</sup>

Panchakarma therapy of Ayurveda has attracted attention of the people worldwide as it is an unique sort of treatment of various

chronic, auto immune, hormonal, degenerative disorders, etc., where other sorts of treatments have no satisfactory answer. Acharya Charaka has highlighted the role of Panchakarma therapy by stating that the disease treated by *Shodhana* will never recur, whereas the treatment with *Shamana* therapy may recur in due course of time.<sup>[3]</sup>

In addition, if *Shamana* drugs are administered after proper course of *Shodhana*, then it provides additional relief and thus helps in eradicating the diseases completely.

*Vamana Karma* is the best measure for *Kapha Dushti*, whereas *Virechana Karma* is indicated not only for *Pitta Dosha* but also in *Kapha* and *Rakta Dushti*.

*Jeemutaka* (*Luffa echinata*) is selected for *Vamana* instead of *Madana Phala* (*Randia spinosa*) as it is specially indicated in *Kushtha Roga*.<sup>[4]</sup>

Considering all the above, it has been planned to evaluate comparative efficacy of *Vamana*, *Virechana* and *Shamana Yoga* (Dermo-care) [Table 1] in *Mandala Kushtha* (Psoriasis).

## Materials and Methods

### Study design

An open prospective clinical trial.

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## Patients

Patients suffering from *Mandala Kushtha* fulfilling the inclusion criteria were randomly selected from the Out-Patient Department (OPD) and the In-Patient Department (IPD) section of National Institute of Ayurveda, Jaipur and Girdhara Hospital and Research Centre, Jaipur. Total 47 patients were registered in the trial, out of which 40 patients were completed course of treatment.

## Inclusion criteria

- Patients aged between 12 and 60 years.
- Patients having the clinical features of *Mandala Kushtha* (Psoriasis).

## Exclusion criteria

- Patients aged below 12 and above 60 years.
- Patients with leprosy, tuberculosis, paralysis, and malignant diseases.
- Pregnant women and lactating mothers.
- Patients with systemic disorders viz. uncontrolled hypertension, cardiac problems, diabetes mellitus, etc.
- Patients who are on steroids.

## Plan of study

Registered patients were equally categorized in to four groups (10 in each group).

Group A: Vamana and Virechana

Group B: Vamana and Virechana followed by administration of Dermo-care (Anubhuta Yoga)

Group C: Only Dermo-care

Group D: Tab. Neotrexate (Methotrexate 7.5 mg/week)

## Posology and duration of treatment

- The trial drug, Dermo-care [Table 1] – For the present

**Table 1: Ingredients of Dermo-care (per 5 g)**

Sanskrit names	Latin name	Part use	Ratio
<i>Bakuchi</i>	<i>Psoralea corylifolia</i>	Seed	500 mg
<i>Katuka</i>	<i>Picrorhiza kurroa</i>	Root	500 mg
<i>Chitraka</i>	<i>Plumbago zeylanica</i>	Root	500 mg
<i>Haritaki</i>	<i>Terminalia chebula</i>	Pericarp	250 mg
<i>Amalaki</i>	<i>Embelia officinalis</i>	Pericarp	250 mg
<i>Guduchi</i>	<i>Tinospora cordifolia</i>	Stem	250 mg
<i>Trivrita</i>	<i>Operculina turpethum</i>	Root	250 mg
<i>Haridra</i>	<i>Curcuma longa</i>	Rhizome	250 mg
<i>Mustaka</i>	<i>Cyperus rotundus</i>	Rhizome	250 mg
<i>Vidanga</i>	<i>Embelia ribes</i>	Fruit	250 mg
<i>Aragvadha</i>	<i>Cassia fistula</i>	Fruit pulp	250 mg
<i>Mandukaparni</i>	<i>Centella asiatica</i>	Whole plant	250 mg
<i>Jyotishmati</i>	<i>Celastrus paniculatus</i>	Seed	250 mg
<i>Shuddha Guggulu</i>	<i>Commiphora mukul</i>	Oleo-Resin	250 mg
<i>Shuddha Shilajita</i>	<i>Asphaltum punjabinum</i>	–	250 mg
<i>Shuddha Gandhaka</i>	–	–	250 mg
<i>Lohabhasma</i>	–	–	125 mg
<i>Shuddha Suvarna Makshika</i>	–	–	125 mg

clinical research work, a hypothetical indigenous herbo-mineral compound is prepared in *Churna* (powder) form was administered 5 g after meal, twice a day with potable water for a period of 2 months.

- Standard control drug, Tab. Neotrexate (Methotrexate) 7.5 mg/week (2.5 mg for three times at 12 hourly – 8 pm-8 am-8 pm/week) with potable water for 2 months. The drug was administered under the supervision of a dermatologist.
- Follow up was done for 2 months at regular interval of 15 days.

## Treatment schedule

### Vamana procedure

1. *Koshtha Pareeksha* was done with *Triphala Churna* (10 g) in morning with luke warm water for 1 day.
2. *Deepana, Pachana* with *Panchakola Churna* (5 g) twice a day for 2 days or till appearance of *Nirama Lakshana*.
3. *Snehapana*<sup>[5]</sup>: *Panchatikta Ghrita*<sup>[6]</sup> was administered for the purpose of *Snehapana* orally.
4. *Abhyanga* and *Swedana* – *Sarvanga Abhyanga* by *Dashamoola Tail* and *Sarvanga Swedana* by the *Dashamoola Kwatha* was done.

### Vamana Yoga

1. Patients were asked to drink *Ksheera* (milk) till *Akantha Purana* is obtained. Approximately 2-3 l is needed to observe the signs and symptoms of *Akantha Purana*.
2. Administration of *Jeemutaka Phala* (12 fruits) *Kwatha* with 2 g of *Vacha* (*Acorus calamus*), 1 g of *Saindhava* (Rock salt) and 30 g of *Madhu* (Honey) as *Vamana Yoga*.
3. About 2-3 l of *Vamanopaga Dravya* i.e. *Yashtimadhu Phanta* (hot infusion of *Glycyrrhiza glabra*) was given, followed by administration of *Lavanodaka* (rock salt water).
4. *Dhoompana* was done with *Dashamoola Churna* through the mouth for 3-4 puffs.
5. *Vamana Karma* was followed by *Samsarjana Karma* as per the type of *Shuddhi*.

### Virechana procedure

This is same as *Vamana Karma* except that *Koshtha Pareeksha*, *Deepana-Pachana*, and *Kaphotkleshakara Ahara*, which is not done in *Virechana Karma*, whereas *Abhyanga* and *Swedana* were done for 3 days.

The *Virechana Yoga* [decoction made up of 15 g each of *Aragvadha* (*Cassia fistula*), *Draksha* (*Vitis vinifera*), *Haritaki* (*Terminalia chebula*) +4 g *Katuki Churana* (*Picrorhiza kurroa*) +30 ml *Eranda Taila* (castor oil) +2 tablets of *Abhayadi Modaka*] was given in empty stomach at 8-10 am.

*Paschat Karma*, same as *Vamana Karma* except *Dhoomapana*.<sup>[7]</sup>

## Criteria for assessment of results

Psoriasis Area and Severity Index<sup>[8]</sup> (PASI) score was considered for both subjective and objective parameters.

## Totaling up the index

For each skin section, add up the three severity scores and multiply the total by the area score, and then multiply that result by percentage of the skin in that section.

The severity of PASI Parameters (scaling, erythema, and induration) and other parameters were assessed in the following manner.

## PASI Scoring

Skin sections	Erythema*	Induration*	Scale*	Coverage area <sup>⊗</sup>	Percentage of BSF	Total PASI
<b>Legs 40%</b>						
BT	_____	+ _____	+ _____	× _____	× 0.04	= _____
AT	_____	+ _____	+ _____	× _____	× 0.04	= _____
<b>Torso 30%</b>						
BT	_____	+ _____	+ _____	× _____	× 0.03	= _____
AT	_____	+ _____	+ _____	× _____	× 0.03	= _____
<b>Arms 20%</b>						
BT	_____	+ _____	+ _____	× _____	× 0.02	= _____
AT	_____	+ _____	+ _____	× _____	× 0.02	= _____
<b>Head 10%</b>						
BT	_____	+ _____	+ _____	× _____	× 0.01	= _____
AT	_____	+ _____	+ _____	× _____	× 0.01	= _____

BT - Before Treatment; AT - After Treatment; BSF - Body Segment Factor; <sup>⊗</sup>Rating for regional surface area; \* Rating for Erythema, Induration and Scaling

## ⊗Rating for regional surface area

Score	Coverage (%)
0	0
1	1-<10
2	10-<30
3	30-<50
4	50-<70
5	70-<90
6	90-100

## \*Rating for Erythema, Induration, Scaling

Score	Severity
0	None
1	Mild
2	Moderate
3	Severe
4	Very severe

## A. Erythema

Score	Severity
0	None No erythema
1	Mild Patch with reddish-white tinge
2	Moderate Patch with reddish tinge
3	Severe Patch with dull red color
4	Very severe Patch with bright red in color

## B. Induration – Purely Subjective

## C. Scaling

Score	Severity
0	None No scaling
1	Mild On scratching, scales settle in pits on nails
2	Moderate If the scales fall on scratching
3	Severe Scales found on clothes without scratching
4	Very severe Scaling found on bed without scratching

The severity of *Kandu* (itching), *Mandal Rupa* (oval/round patches), *Krodha* (anger), *Shoka*, and *Chinta* (anxiety) was assessed in the following manner:

A. *Kandu* (Itching)

Score	Severity
0	None No itching
1	Mild Itching reduced on scratching
2	Moderate Reduced on oral medication
3	Severe Reduced on oral and external medication
4	Very severe Occasionally reduced with medication

B. *Mandala Rupa* (Oval/round patches)

Score	Severity
0	None No patches/clear skin
1	Mild Drop like circle
2	Moderate Oval-round patches
3	Severe Large oval-round/elliptical patch
4	Very severe Patches mixed with each other

D. *Krodha* (Anger)

Score	Severity
0	None No anger
1	Mild When gets anger, not showing outside
2	Moderate Usually gets anger but showing outside in control manner
3	Severe Shouting loudly but throwing the articles occasionally
4	Very severe Shouting loudly and harming others occasionally

E. *Shoka*

Score	Severity
0	None No <i>Shoka</i>
1	Mild Occasional thinking of problem with disturbed concentration
2	Moderate Occasional thinking of problem with disturbed sleep

3	Severe	Always thinking of problem with disturbed sleep
4	Very severe	Not responding to others properly with insomnia

### F. Chinta (Anxiety)

Score	Severity	
0	None	No anxiety of any type
1	Mild	Other anxiety but not anxious about the disease
2	Moderate	Anxious, but believe that the disease will be cured
3	Severe	Anxious and believe that the disease will not be cured
4	Very severe	Very anxious, no belief in any therapy and believe that the disease will never be cured

## Observations

Maximum patients were in the age group of 20-30 years and 65% were males, 87.5% belongs to Hindu community, 85% were married and have primary level education, 55% patients had sedentary type of work, 80% were from urban area, 25% have chronicity of more than 5 years and 90% have negative family history of Psoriasis. Majority of patients, (72.5%) were taking allopathic treatment and 12.5% were taking Ayurvedic treatment. 62.5% patients have irregular bowel habits. 50% patients have *Samyak Nidra* and 35% have *Alpa Nidra*. Majority of the patients (97.5%) have gradual onset of the disease. 65% patients have *Viruddha Ahara* with 30% patients taking milk with *Amla* and *Lavana Rasa*. Milk with fish is reported in 7.5% and milk with onion in 10%. *Chinta* was the major *Manasika Nidana* reported by 55% patients followed by *Krodha* in 42.5%, and *Shoka* in 27.5% patients. A total of 70% reported aggravation of symptoms in winter season, 85% each have presented with the lesions on the legs and torso, 82.5% had lesions on arms, and 75% had lesions on head. 7.5% had lesions on palm and sole and 5% had lesions on scalp. Nobody was observed to have lesions on genitals. Nearly 80% have presented with the plaque type of psoriasis, 10% having guttate psoriasis, and only 5% each having erythrodermic and pustular psoriasis. Nearly 90% have candle grease sign positive whereas Auspitz sign and Koebners phenomenon were found in 62.5% and 10%, respectively.

*Sweta-Rakta Varna* (faint reddish white) was observed in 87.5%, *Sukla Rom-Raji Santanini* (pervaded with white hairline/scale) in 85%, *Kandu* (itching) in 100%, *Sukla Picchala Srava* (thick white and slimy discharge) in 15%, *Utsana Mandala* (raised patches) in 87.5%, and *Ananonya Sansat Mandala* (patches joined with each other) in 62.5% patients. *Anubandhi Vedana* like *Ati Sweda* (over sweating) in 2.5%, *Asweda* (absence of sweating) in 10%, *Shareera Guruta* (heaviness of the body) in 40%, *Malabaddhata* (constipation) in 50%, *Agni Mandya* (loss of appetite) in 37.5%, *Suptata* (numbness) in 2.5%, and *Toda* (pain) in 10% patients.

## Results

### PASI scoring

In leg total PASI [Table 2], torso total PASI [Table 3], arm total

PASI [Table 4], head total PASI [Table 5] statistically significant results were noted in all the four groups.

Marked improvement in total PASI was observed in the patients of Group B is (82.70%) and Group D (79.58%), which are both statistically highly significant. Moderate improvement was observed in Group A (58.29%) and Group C (53.70%), which is statistically significant and highly significant, respectively [Table 6].

On comparing the effect in all groups; it is clear that the patients from Group B showed maximum percentage relief as compared with other groups. Groups B, C, and D were statistically highly significant.

### Kandu

Moderate improvement in *Kandu* was observed in the patients of Group B (61.11%) and Group D (65.62%), which is statistically significant and highly significant, respectively. Mild improvement was observed in Group A (33.33%) and Group C (37.95%) and are mildly significant and highly significant, respectively.

On comparing the effect on all groups, it is clear that the patients from Group D showed maximum percentage relief as compared with other groups. Group C and D were statistically highly significant.

### Mandala Rupa

Moderate improvement in *Mandala Rupa* was observed in the

**Table 2: Pattern of clinical improvement in leg total PASI in patients of all the four groups**

Group	n	Mean			Relief %	S.D. (±)	S.E. (±)	t	P
		BT	AT	Diff.					
A	8	12.35	5.3	7.05	57.08	3.847	1.364	5.16	0.001
B	8	8.30	1.40	6.90	83.13	4.105	1.451	4.75	0.01
C	8	7.95	4.10	3.85	48.42	1.723	0.609	6.32	0.001
D	10	13.04	2.72	10.32	79.14	4.935	1.560	6.60	0.001

**Table 3: Pattern of clinical improvement in torso total PASI in patients of all the four groups**

Group	n	Mean			Relief %	S.D. (±)	S.E. (±)	t	P
		BT	AT	Diff.					
A	9	10.00	4.46	5.54	55.40	4.534	1.511	3.66	0.01
B	7	8.27	1.32	6.95	84.03	2.469	0.933	7.44	0.001
C	8	8.36	3.60	4.76	56.93	1.373	0.485	9.81	0.001
D	10	9.60	1.80	7.80	81.25	3.930	1.244	6.27	0.001

**Table 4: Pattern of clinical improvement in arm total PASI in patients of all the four groups**

Group	n	Mean			Relief %	S.D. (±)	S.E. (±)	t	P
		BT	AT	Diff.					
A	9	5.55	1.91	3.64	65.58	2.595	0.865	4.20	0.01
B	6	3.13	0.63	2.50	79.87	1.025	0.418	5.98	0.01
C	8	4.15	2.10	2.05	49.39	0.681	0.241	8.50	0.001
D	10	4.86	1.10	3.76	77.36	2.008	0.635	5.92	0.001

patients of Group B (63.33%) and Group D (55.17%), which is statistically highly significant. Mild improvement was observed in Group A (35.48) and Group C (29.62%), which is statistically insignificant and highly significant respectively.

### Krodha

Moderate improvement in *Krodha* was observed in the patients of Group B (57.08%) and Group C (67.00%), which is statistically insignificant. Mild improvement was observed in Group A (42.00%) while minimal improvement in Group D (22.22%), which is significant and insignificant respectively.

### Shoka

Moderate improvement in *Shoka* was observed in the patients of Group A (54.64%), Group B (71.67%), and Group C (60.00%). Group A is statistically significant while Groups B and C both are insignificant.

### Chinta

Moderate improvement in *Chinta* was observed in the patients of Group B (61.08%), Group C (55.55%), and Group D (66.66%). Group B is statistically highly significant whereas Groups C and D are moderately significant. Mild improvement was observed in Group A (41.32%) and is insignificant.

### Overall effect of therapy

- In Group A, moderate improvement was observed in 20% patients whereas mild improvement was observed in 80% patients.
- In Group B, marked improvement was observed in 10%

**Table 5: Pattern of clinical improvement in head total PASI in patients of all the four groups**

Group	n	Mean			Relief %	S.D. (±)	S.E. (±)	t	P
		BT	AT	Diff.					
A	8	1.95	0.75	1.20	61.53	0.621	0.220	5.44	0.001
B	6	1.98	0.41	1.56	78.88	0.554	0.226	6.90	0.001
C	7	1.70	0.75	0.95	55.88	0.837	0.316	3.05	0.05
D	9	2.70	0.54	2.16	80.00	0.761	0.253	8.53	0.001

patients whereas moderate improvement was observed in 90% patients.

- In Group C, mild improvement was observed in 100% patients.
- In Group D, moderate improvement was observed in 80% patients whereas mild improvement was observed in 20% patients.

No one was observed to have improvement/controlled or minimal/no response toward therapy in any group [Table 7].

### Recurrence

After 1 month, 0%, 0%, 28.5%, 10% and after 2 months 25%, 20%, 40%, 37.5% recurrence was found, respectively in A, B, C, D groups.

## Discussion

Changes in life style, irregularities in dietary habits became major issues in current scenario and are responsible in manifesting a number of ailments. Significance of lifestyle and diet, etc., have been well recognized in Ayurvedic classics and emphasis a following the guidelines on *Dinacharya*, *Rutucharya* in eradication of various diseases can be readily observed in them.<sup>[9-14]</sup>

### Deepana and Pachana

*Panchakola Churna* increases the *Agni* and then helps in *Ama Pachana*.

### Snehana

*Snehapana* with *Panchatikta Ghrita* as a *Purvakarma* subsides the symptoms like *Rukshata*, *Daha*, etc., Similarities in chemical and physiological nature in *Ghrta* and human cell membrane intensifies the penetration of *Sneha (Panchatikta Ghrita)* in to deeper tissues causing partial rejuvenation of cell, smoothing of vitiated *Dosha* (stagnated metabolic wastes).

### Vamana and Virechana

Soothened *Doshas* will get liquefied and reaches to *Koshtha*

**Table 6: Pattern of clinical improvement in total PASI in patient of all the four groups**

Group	n	Mean			Relief %	S.D. (±)	S.E. (±)	t	P
		BT	AT	Diff.					
A	10	25.37	10.58	14.79	58.29	12.972	4.105	3.58	0.01
B	10	15.5	2.68	12.81	82.70	7.840	2.479	5.171	0.001
C	10	17.56	8.13	9.43	53.70	4.739	1.498	6.295	0.001
D	10	29.93	6.11	23.82	79.58	12.969	4.101	5.808	0.001

**Table 7: Overall effect of therapy in all four groups**

Result	Group A		Group B		Group C		Group D	
	No. of patient	%	No. of patient	%	No. of patient	%	No. of patient	%
Improvement/controlled	0	0	0	0	0	0	0	0
Marked improvement (>75% relief)	0	0	1	10	0	0	0	0
Moderate improvement (50-75% relief)	2	20	9	90	0	0	8	80
Mild improvement (25-50% relief)	8	80	0	0	10	100	2	20
Minimal improvement (<25% relief)	0	0	0	0	0	0	0	0
No response (0% relief)	0	0	0	0	0	0	0	0



by Swedana, which can be easily eliminated by the action of Vamana and Virechana.

Thus it is clear that the toxins or nitrogenous waste materials that are collected in lower intestinal cells are removed by Virechana and thus cleansing the lower passage and rejuvenating each and every cell of lower GIT.

These Shodhana (Vamana and Virechana) probably may leads to certain endogeneous changes in the body responsible for the alleviation of psoriatic pathological process.

### Dermo-care (Kalpit Yoga)

Most of these drugs have following properties – *Kushthaghna*, *Krimighna*, *Rakta Shodhana*, *Kandughna*, *Amapachana*, *Medhya*, *Rasayana*, *Kaphaghna*, *Twachya*, *Yakriduttejaka*, *Agni Vardhak*, and also *Tridoshaghna*. The synergistic actions of *Tikta* and *Kashaya Rasa* dominant herbs and minerals are likely to check the etio-pathogenesis of *Mandal Kushtha* (Psoriasis) and arrest its progress.

### Conclusion

*Vamana* and *Virechana* along with Dermo-Care proved more effective to control erythema of leg and arm; induration of leg, torso, arm, and head; scales of leg, torso, and head; coverage area of torso and arm; *Mandal Rupa* and *Shoka*. Only Dermo-Care is more effective to control *Krodha*. Neotrexate (Methotrexate) is more effective to control erythema in torso and head; scales in arm; coverage area of leg and head; *Kandu* and *Chinta*. *Shodhana* independently have shown much better results than the patients treated with *Shamana* therapy (Dermo-care yoga). Neotrexate (Methotrexate) independently have shown much better results than the patients treated with *Shodhana* alone or *Shamana* therapy (Dermo-care) alone. *Shodhana* followed by

*Shamana* therapy have shown better results than the patients treated with *Shodhana*, *Shamana* therapy or modern medicine alone.

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## हिन्दी सारांश

## शोधन कर्म एवं हर्बोमिनरल औषध योग की मण्डल कुष्ठ (सोरियेसिस) की चिकित्सा में कार्मुकता का अध्ययन

गुञ्जन मंगल, गोपेश मंगल, राधेश्याम शर्मा

आयुर्वेद की कोई भी व्याधि सोरियेसिस के लक्षणों वाली नहीं है, परन्तु इसके कुछ लक्षण मण्डल कुष्ठ से मिलते हैं। भारत की जनसंख्या 0.८% सोरियेसिस से पीड़ित है। यह एक पेप्यूलो-स्क्रैमस विकृति है, जो एरिथ्रिमेटो-स्क्रैमस विकृति से जानी जाती है। इसका सही कारण पता नहीं है, परन्तु वमन और विरेचन कर्म से ये व्याधि ठीक होती है। अध्ययन में ४० रोगी नैदानिक आधार पर, बिना क्रम के ४ वर्ग में लिये गये। वर्ग अ-वमन, विरेचन; वर्ग ब-वमन, विरेचन और डर्मोकेयर ५ ग्रा. दो माह के लिए; वर्ग स-डर्मोकेयर ५ ग्रा. दो माह के लिए; वर्ग द-Tab. Neotrexate 7.5 mg प्रति सप्ताह, तीन विभाजित मात्रा में। चिकित्सा के पश्चात् लाक्षणिक आधार पर वर्ग ब में १० प्रति रोगी में अधिक लाभ पाया गया; वर्ग अ में २० प्रति रोगी में मध्यम लाभ पाया गया; वर्ग ब में १० प्रति रोगी में मध्यम लाभ पाया गया; वर्ग द में ८० प्रति रोगी में मध्यम लाभ पाया गया; वर्ग अ में ८० प्रति रोगी में अल्प लाभ पाया गया; वर्ग स में ८० प्रति रोगी में अल्प लाभ पाया गया एवं वर्ग द में २० प्रति रोगी में अल्प लाभ पाया गया।