



## Research Article

### “EVALUATION OF ANTIOXIDANT ACTIVITY OF *TULASI (OCIMUM SANCTUM LINN.)* IN *VICHARCHIKA (ECZEMA)*”

<sup>1\*</sup>Dr. Rajesh Iyer, <sup>2</sup>Dr. Shraddha Chaudhari, <sup>2</sup>Dr. Padma Saini, <sup>3</sup>Dr. Pravin Patil

1. Assistant Professor, Department of Dravyaguna, M.E.S. Ayurved College, Ghanekunt, Lote
2. PG Scholar, Department of Dravyaguna, Ayurved College, Sion, Mumbai -22
3. Assistant Professor, Department of Samhita & Siddhanta, Ayurved Mahavidyalaya, Sion, Mumbai-22, India

Res. Add-501-B, Eden 2 building, Hiranandani gardens, Powai, Mumbai-76

Contact no:9168068665, Email ID: [rajyier26@gmail.com](mailto:rajyier26@gmail.com)

## ABSTRACT

*Vicharchika* is commonly found disease which not only affects physical and mental health but also social well-being of an individual. In allopathic medicine *vicharchika* is being correlated with Eczema. Where oxidative stress is found to be a major causative factor & *Tulasi(Ocimum sanctum Linn.)* consists of plenty of anti-oxidants mainly Eugenol & luteolin. *Tulasi* by its *katu, tikta, rasa* and *laghu, ruksha guna* acts as *kledashoshaka* & *ushna veerya* reduces pain in *vicharchika*. In ancient text various *acharyas* have highlighted the *kushthaghna* karma of *Tulasi*. An open labeled parallel group study was done in Seth R. V. Mahavidyalaya Sion, Mumbai-22; 90 individuals divided in 3 groups namely, Group A receiving *Tulasi churna* 1gm thrice a day orally & *Tulasi* paste for local application; Group B receiving Tablet Cetrizine 10mg HS & ointment Betnovate for local application, Group C receiving combination of both. Subjective criteria was assessed on following *lakshana- kandu, pidika, daha, strava, twaka rukshata, vaivarnyata, vedana, raji*. Whereas objective criteria was assessed by checking enzyme level of SOD (Superoxide dismutase), MDA(Malondialdehyde), GSH(Glutathione). Subjective criteria is shown in %. Anova test was applied to objective criteria in Group A, Group B, Group C. F value is found to be highly significant at 87 degrees of freedom, (pooled dF) for GSH (Glutathione), SOD(Superoxide dismutase), and MDA(Malondialdehyde) at  $p < 0.05$ , concluding definitely *Tulasi churna* is *Kushthaghna* & an effective anti-oxidant drug.

**Keywords:** *Vicharchika, Tulasi, Eczema, Antioxidant, Ocimum sanctum Linn., MDA (Malondialdehyde), SOD (Superoxide dismutase), GSH (Glutathione).*

## INTRODUCTION

Ayurveda an eternal science of healthy living deals with physical, psychological and spiritual wellbeing of the human being and covers all the aspect of human life. It is not a materialistic science but a philosophical and factual truth, which is enhanced by our great ancient sages, through their experience, logic and power of wisdom. Whole ancient society

tried to achieve all four prime goals of life viz. *dharma, artha, kama & moksha*<sup>[1]</sup>, so they had a smooth, sound, safe, assured steady and healthy life style. On the other hand in rapidly developing countries due to pollution, unhygienic conditions, hot and humid environment and more susceptible to skin diseases. *Vicarchika* is one such kind of skin disease. Though it has been described under *ksudra kushtha*<sup>[2]</sup> in *Ayurvedic* texts and also mentioned as

a curable disease yet the relapsing nature of this disease makes it more painful for patient and troublesome for physician. All *Kustha* are having *tridosaja* origin<sup>[3]</sup> so *Vicharchika* can be said in same way. Despite of its *tridosaja* origin various *acharya* mentioned different dominancy in *Vicharchika* i.e. *Kapha*<sup>[4]</sup> *Pitta*<sup>[5]</sup>, *Vata Pitta*<sup>[6]</sup> which suggest specific symptoms complexes and the acute & chronic stages of the disease. *Vicharchika* has been correlated with modern disease 'eczema' by many authors. About 30% of all the skin disease is eczematous. It is always difficult to trace out the exact cause of disease, because it may be associated with the occupation, hobbies, diet etc. that the patient is exposed to during his routine life. Besides so much work on this disease a successful treatment is still not possible in any system of medicine. The modern treatment available for eczema which includes steroids gives only symptomatic relief and also gives unnecessary side effects to the patients.

As oxidative stress appears to be an important part of many human diseases<sup>[7]</sup> Exogenous Antioxidants are widely used as ingredients in dietary supplements and have been investigated for prevention and treatment of various diseases. Endogenous anti-oxidant defense system developed by the body can be classified into two groups-enzymatic & non-enzymatic<sup>[8]</sup>. The enzymatic defense system includes different endogenous enzymes like Superoxide dismutase (SOD). MDA is oxidative stress marker in the body which increases on increase in oxidative stress. Non-enzymatic defense system includes Vit.E, Vit.C and reduced Glutathione (GSH). *Rasayana* is a branch of *ashtanga ayurveda* which is basically a rejuvenation therapy that deals with the maintenance of health and increasing the immunity of body. *Rasayana dravya* prevents early ageing which is nothing but the action of antioxidants. Hence *Rasayana dravya* and antioxidants can be correlated with each other. *Tulsi* is one such *dravya*. *Tulasi (Ocimum sanctum Linn.)* contains Eugenol which is powerful antioxidant. Eugenol is a naturally occurring phenolic compound which reduces cell necrosis and also acts as antiseptic. There is already enough proof that *vicharchika* (Eczema) is a oxidative stress related disease.

Also in ancient text *Tulasi* is described under *Kushthaghna dravya*. As *Tulasi* by its *katu rasa*<sup>[9]</sup>. *Tiktaanurasa* and *laghu ruksha guna*<sup>[10]</sup> acts as a *kledashoshaka*. Due to its *ushna virya* it reduces pain in *vicharchika*. Therefore by using Natural antioxidants one can reduce the oxidative stress in patients of *Vicharchika* and thereby making its prognosis better.

## MATERIALS AND METHODS

### Selection of cases

There was random selection of patient from Sheth R. V. Ayurvedic Hospital, Sion; Mumbai, India. Known cases of eczema were taken. Study was carried out as per Ethical Clearance Number-AMS/1560/13-14

### Type of study

Parallel group, open labeled

### Inclusion Criteria

- Age: 18 yrs to 60 yrs
- Sex: both Male & Female
- Informed consent signed
- Patients diagnosed on the basis of classical signs and symptoms of *Vicharchika* described in *ayurvedic* texts

### Exclusion criteria

- Secondary eczema
- Other skin diseases like psoriasis, leprosy etc.
- Patients with major systemic illness eg. Diabetes mellitus, Impaired Renal function, Kochs etc.
- Immuno-compromised patients or having Ca, HBsAg infection,
- Pregnant women
- Skin viral infection i.e. Herpes zoster

**Study design:** Total no. of subjects: 90

**Group A:** 30 cases- *TULASI* churna oral intake & Local application of *Tulasi* paste

**Group B:** 30 cases -Tab. Cetrizine 10mg HS + Betnovate Oint. Locally BD

**Group C:** 30 cases *TULASI* (oral intake & Local application) & Tab. Cetrizine 10 mg HS + Betnovate oint. Locally BD

**Duration of study:** 60 days

**Drug source:** Dried powder leaves of  
*TULASI*(*Ocimum sanctum* Linn.)

**Formulation:** *Churna* & paste

**Mode of administration:** Oral & local

**Dosage:** 1 gm thrice a day

**Anupana:** Warm water

2- *Pidika* in less than 5 sq. cms in whole affected area

3- *Pidika* in between 5-10 sq. cms in whole affected area

4- Many or uncountable *pidika* in the whole affected area

**Follow up:** Every 15 days after first visit upto 60 days

## ASSESSMENT OF EFFICACY

### A) Subjective criteria

- General & systematic examination of patients at every 15 days visits up to 60 days.
- Fortnightly assessment in the reduction of following symptoms:
  1. *Kandu*(pruritus)
  2. *Pidika*(vesicles)
  3. *Daha*(burning sensation)
  4. *Strava*(Discharge)
  5. *twaka rukshata*(dryness of skin)
  6. *vaivarnyata*(Discoloration)
  7. *vedana*(Pain)
  8. *raji* (scales)

### B) Objective criteria

Levels of

1. MDA - Malondialdehyde
2. GSH - Glutathione Peroxidase
3. SOD - Superoxide Dismutase

### Gradation according to symptoms is as follows

#### 1) *Kandu* (pruritus)

- 0 - Absent
- 1 - Mild or Occasionally
- 2 - *Kandu* on & off
- 3 - Continuous *Kandu* without disturbed sleep
- 4 - Continuous *Kandu* with disturbed sleep

#### 2) *Pidika* (vesicles)

- 0- Absent
- 1- *Pidika* disappears but discoloration persists

#### 3) *Daha* (burning sensation)

- 0- Absent
- 1- Occasionally
- 2- *Daha* on & off
- 3- Continuous *Daha* without disturbed sleep
- 4- Continuous *Daha* with disturbed sleep

#### 4) *Strava* (Discharge)

- 0- Absent
- 1- Occasional *Strava* after itching
- 2- Mild *Strava* after itching
- 3- Moderate *Strava*
- 4- Profuse *Strava* making clothes wet

#### 5) *Tvak Rukshata* (dryness of skin)

- 0- Normal skin
- 1- Loss in skin's normal unctuousness
- 2- Slightly dry skin
- 3- Excessively dry skin
- 4- Dry thickened skin

#### 6) *Vaivarnyata* (Discoloration)

- 0- Normal coloration of the skin
- 1- Slight discoloration
- 2- Moderate discoloration
- 3- Excessive discoloration
- 4- Blackish coloration of skin

#### 7) *Vedana* (Pain)

- 0- No pain
- 1- Mild pain
- 2- Moderate pain
- 3- Severe pain
- 4- Very severe pain

#### 8) *Raji* (scales)

- 0- No thickening of skin
- 1- Slight thickening

- 2- Thickening of skin but no criss-cross marking
- 3- Thickening with criss-cross marking
- 4- Severe lichenification

### STATISTICAL ANALYSIS

The subjective parameters were assessed by applying “**Wicoxon Matched-Pairs Signed Ranks Test**” [11]. Anova test was applied to objective criteria. Also subjective improvement is shown in Percentage relief.

### RESULTS:-

#### Symptomatic relief within groups

Symptoms	Group-A	Group-B	Group-C
<i>Kandu</i>	86.67	93.33	93.33
<i>Pidika</i>	85.18	84.00	92.00
<i>Daha</i>	47.05	68.42	78.94
<i>Strava</i>	69.23	82.35	84.61
<i>Tvaka rukshata</i>	64.70	71.42	82.35
<i>Vaivarnyata</i>	76.67	90.00	93.33
<i>Vedana</i>	78.57	85.18	89.28
<i>Raji</i>	73.33	83.33	86.67

### TOTAL EFFECT OF THERAPY

Following table shows the comparative total effect of therapies as per groups.

Table showing total effect of therapy

Total Improvement	Group A	Group B	Group C
<b>Excellent</b> (>75%)	06.67	13.33	23.33
<b>Good</b> (50 to 75%)	63.33	66.67	73.34
<b>Moderate</b> (25 to 50%)	20.00	20.00	03.33
<b>No</b> (<25%)	10.00	00	00

### Statistical analysis of objective criteria:

CRIT ERIA	GROUP A			GROUP B			GROUP C		
	Me an	S D	N	Me an	S D	N	Me an	S D	N
<b>GSH</b>	13.58	6.96	30	11.49	4.25	30	19.01	4.86	30
<b>SOD</b>	0.43	0.24	30	0.38	0.42	30	0.56	0.37	30
<b>MDA</b>	2.29	1.02	30	1.78	0.73	30	3.33	0.67	30

(SD- Standard deviation, N- Number of pairs )

Out of 90 patients ranging from the age group of 18 to 60 years maximum patients 31(34.44%) were between age group of 41 to 50 years. Among 90 patients 51(56.67%) were females & 39(43.33%) were male. Among 90 patients 9(10%) were students, 30(33.33%) were housewives, 17(18.89%) were doing service & 34(37.78%) were workers. Among 90 patients 49(54.44%) were having *mandagni*, 33(36.67%) had *visham agni* & 8(8.89%) had *tikshna agni*. Among 90 patients 49(54.44%) had *Madhyam koshtha*, 32(35.56%) had *krura koshtha* & 9(10%) had *mridu koshtha*. Among 90 patients 26(28.29%) were allergic & 64(71.11%) were non allergic.

The effect of Tulasi churna, paste. Tab. Cetrizine, oint. Betnovate & combination of both the cardinal symptoms of 90 patients of *Vicharchika* are as follows. Relief of *Kandu* in Group A- 65.82%, Group B- 70.33 % & Group C- 76.14%; relief of *Pidika* in Group A-55%, Group B- 61.02%, Group C-68.42%; relief of *Daha* in Group A- 42.42%, Group B-54.76%, Group C-62.50%; relief of *Strava* in Group A- 57.14%, Group B- 64.51%, Group C-72.41%; relief in *Tvaka Rukshata* in Group A- 42.85%, Group B- 52.17%, Group C- 62.22%; relief in *Vaivarnyata* in Group A- 54.43%, Group B- 63.63%, Group C-72.15%; relief in *Vedana* in Group A- 64.70%, Group B- 67.10%, Group C-73.42%; relief in *Raji* in Group A- 55.40%, Group B- 61.4%, Group C-69.73%. Total effect of therapies on the cardinal symptoms. In group A, total associated symptoms were relieved

by 56.37%, in group B, by 60.79%, In group C, by 70.51%. Thus better result was provided in group C, that is in patients who were given combination of both the therapies.

Comparison in objective criteria showed that there is 41.89% improvement in MDA in group A, 32.83% in group B, and 53.10% in group C. GSH levels improvement is 37.62% in group A, 28.17% in group B, 89% in group C. SOD levels improvement is 44.60% in group A, 34.78% in group B, 58.33% in group C. There were no severe adverse effects noted. Only few subjects experienced nauseating sensation, diarrhea, and intolerance of smell. But all the symptoms reduced after 2-3 days. So, *Tulsican* be used in *vicharchika* as an effective *kushthaghna dravya*.

### **DISCUSSION:-**

According to *ayurvedic* perspective *Kushtha* is not a single disease. It is group of disease which affects skin. In this study 90 individuals suffering from *Vicharchika* were taken & evaluation of *Tulasi* (*Ocimum sanctum* Linn.) as *kushthaghna dravya* was done. *Kushthaghna* karma is broad terminology, which includes drugs that cures disease from the base of skin. *Kandughna*, *Varnya* & *Udardaprashamana* are a part of *Kushthaghna* karma. *Acharya Charak* has mostly described *tikta*, *kashaya rasa* & *laghu*, *ruksha gunatmaka dravya* as *Kushthaghna*. *Tikta*, *kashaya rasa* are *kaphakleda vishoshaka*. *Vicharchika Kushtha* is *kaphapradhana tridoshaja* & *chirakalin*. *Tulasi* by its *katu rasa*. *Tikta* and *kashaya anurasa* and *laghu ruksha guna* acts as a *kledashoshaka*. Due to its *ushna virya* it reduces pain in *vicharchika* (symptom of *vata*). *Tulsi* used locally as *lepa* reduces *daha* in *vicharchika*. In *kushtha shodhana* is *pradhan chikistha*. *Tulsi* being mild laxative acts *kapha pitta shodhana*. In *kushtha kapha ashrit twaka*, *mansa*, and *ambu*, *pitta ashrit rakta* are *dushya*. *Kaphapittavishodhan* done by *rechanakarma* of *tulsi* helps to get rid of pathological content of skin and helps to normalize skin. Lipid peroxidation is considered as one of the important process which is responsible for development of stress in skin by generation of free

radicals which damage epidermis of skin layer aggravating the pathogenesis of skin disease. So there is development of keratogenesis proliferation hence development of inflammation. There are many flavonoids and polyphenol. *Tulsi* has *Eugenol* and *luteolin* in abundant. *Eugenol* helps to reduce oxidative stress in skin by scavenging free radicals. Also acts as antiseptic, anesthetic, where *Luteolin* is also a potent anti-oxidant and has anti-inflammatory property. There is significant reduction in MDA value and increases in the level of GSH and SOD values.

### **CONCLUSION**

At the end of the study it was noted that in Group A patients were taken *Tulasi churna* orally & *Tulasi* paste for LA had better relief from symptoms of *Vicharchika* and improvement in enzyme level which denote decrease oxidative stress. In Group C patients taking combination of *Tulasi churna* & Tab. *Cetirizine* had best symptomatic relief as compared to all 3 groups. Group B showed less result as compared to other two groups. Thus we conclude that *Tulasi churna* given along with allopathic drugs give best results in relief of both subjective as well as objective parameters in *Vicharchika*. *Tulasi* is effective in reducing oxidative stress; this is evident from the reduced level of MDA & increase in the level of GSH and SOD in patients' blood sample after administration of *Tulasi*. Thus it can be stated that *Tulasi* is potent antioxidant agent as well as good drug of choice for treatment of *Vicharchika*.

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### **Address For Correspondence:**

**Dr. Rajesh Iyer,**  
Assistant Professor,  
Department of Dravyaguna,  
M.E.S. Ayurved College, Ghanekunt, Lote  
Email: [rajjiyer26@gmail.com](mailto:rajjiyer26@gmail.com)  
Contact No.: 9168068665