

**MANAGEMENT OF SHWITRA (VITILIGO) WITH VAMANA KARMA AND
RAKTAMOKSHANA ALONG WITH SOMRAJI GHRITA – AN OPEN LABELLED
RANDOMIZED COMPARATIVE CLINICAL TRIAL**Vd. Bhaumik Suthar^{1*}, Vd. Falgun Patel² and Vd. Ram Shukla³^{1*} Assistant Professor, Department of Panchkarma, Ananya Ayurved College, Kirc Campus, Kalol, Gujarat 382721.² Associate Professor, Department of Panchkarma, Govt. Akhandanand Ayurved College, Ahmedabad, Gujarat 380001.³ Deputy Hospital Superintendent/ Vaidya Panchkarma, Govt. Ayurved Hospital, Kherva, Gujarat 384001.***Corresponding Author: Vd. Bhaumik Suthar**

Assistant Professor, Department of Panchkarma, Ananya Ayurved College, Kirc Campus, Kalol, Gujarat 382721.

Article Received on 10/09/2023

Article Revised on 31/10/2023

Article Accepted on 20/11/2023

ABSTRACT

Shwitra is a chronic, autoimmune disease that appears on the skin. There is about 1% of whole world population today who are suffering from *Shwitra*. In current study, efforts have been made to evaluate and compare the efficacy of *Vamana Purvak Shamana* and *Raktamokshana purvak shamana chikitsa*. In present study 30 patients having the signs and symptoms of *Shwitra* were selected from Govt. Akhandanand Ayurved Hospital, Ahmedabad. In group A 15 patients were treated with *Vamana karma*, followed by administration of *Somraji Ghrita* orally, in group B 15 patients were treated with *Raktamokshana (Siravedh) karma*, followed by administration of *Somraji Ghrita* orally. Moderate improvement was found in 1(6.66%) patients in group B. Mild Improvement was found in 9 (60%) patients in group A, 6(40%) patients in Group B. Unchanged Improvement was found in 6 (40%) patients in Group A, 8 (53.33%) patient in Group B. It may be concluded that *Siravedh* with followed by *Shamana chikitsa* and *Vamana karma* followed by *Shamana chikitsa* both are equally effective in the management of *Shwitra*.

KEYWORDS: *Raktamokshana, Shwitra, Somraji Ghrita, Siravedh, Vamana karma.***INTRODUCTION**

As we have a tendency to all are aware that, the skin is that the largest organ of body. For the common adult human, the skin contains area of between 1.5-2.0 square meters (16.1-21.5 square feet) and concerning sixteenth of total body weight.

Ayurveda is the repository of life saving remedies which are therapeutically safe and efficacious, but its old concept and practice should be re-modeled and fitted to the contemporary needs of the present sophisticated world. The importance of Ayurveda in global scenario is because of its holistic approach towards positive life style so that we can live healthier and more balanced life.

Skin is the first organ of the body interacting with the environmental agents like physical, chemical and biological agents. Skin could be a link between internal and external atmosphere and is additionally the seat of complexion. Variations in the environmental stimuli and natural ability of body to deal with these factors result in spontaneous remissions and relapses. Interaction with these factors results in specific reaction pattern producing characteristic skin lesions in different parts of

the body. Skin is a mirror that reflects internal and external pathology and thus helps in diagnosis of diseases. It is one of the five 'Indriyas' which is 'Sparshanendriya' as told by Ayurveda, which is responsible for the perception of touch.^[1] Large community prevalence studies have demonstrated that between 20-30% of the population have various skin problems requiring attention.^[2]

A variety of skin diseases are collectively explained in Ayurveda under the heading *Kushtha*. *Shwitra* is a variety of skin disease placed in the chapter of *Kushtha*.

**25 June - has officially been declared "World
Vitiligo Day"**

Vitiligo is a chronic, autoimmune disease that appears on the skin. This disease is most common in northern European countries; its higher incidence is seen in the Negroes of East Africa. India has an incidence approaching 1% i.e. less than European countries.^[3] The prevalence ranges from 0.5% to 1% in most countries, but more than 8% in some regions of India.

Various environmental factors have been suggested as aggravating to vitiligo including stress, withdrawal of systemic corticosteroid, excessive alcohol consumption and smoking but few have shown statistical significance.^[4] Vitiligo is a challenging problem globally and nationally. It is chronic in nature, difficult to treat and even after being cured there are chances of re-occurrence.

In modern science there is no effective treatment of vitiligo. Very few drugs like steroids, PURA, ultraviolet light, and immune system suppressing medications such as Methotrexate are available and they create number of side effects. Now-a-days, in field of skin problems *Ayurveda* contributes remarkably because it eradicates root cause of disease. Ayurvedic treatment reduces the chances of recurrence through *Shodhana*, *Shamana*, and *Nidana parivarjana* - a complete course of treatment.

According to *Ayurveda* three types of *Chikitsa* are described by *Acharya* among them *Samshodhana* is first and the supreme; because of its capacity to eliminate the excessive *Dosha*.^[5] *Kushtha* in general and *Shwitra* particularly have excessive accumulation of *Dosha* and are chronic in nature.^[6] Hence *Samshodhana* therapy seems to be the first line of treatment in *Shwitra*. The classics also emphasize on repeated *Shodhana* in *Kushtha*.^[7]

For present study a complete course of the treatment was selected. i.e. *Vamana karma*, followed by *Somraji ghrta* and *Raktamokshana (siravedh)* followed by *somraji ghrta* as a *shamana* treatment.

MATERIAL AND METHODOLOGY

30 patients of *Shwitra* were randomly selected from OPD & IPD of Govt. Akhandanand Ayurveda College & Hospital, irrespective of their caste, sex, profession and religion.

AIMS AND OBJECTIVE

To evaluate and compare the efficacy of *Vamana Purvak Shamana* and *Raktamokshana purvak shamana* in the management of *Shwitra*.

INCLUSION CRITERIA

1. Patients having sign and symptoms of *Shwitra* (Vitiligo).
2. Patients between age group of 18 years to 60 years were selected.

Table 1: Purva Karma.

Procedure	Drug	Dose	Duration
<i>Deepana & Pachana</i>	<i>Panchkola Churna</i> -2gm/3times a day with warm water	2gm/ 3 times	Till the appearance of <i>Samyaka Deepan</i> and <i>Pachana Lakshana</i> observed.
<i>Snehapana</i>	<i>Somraji Ghrta</i>	20-40ml (starting dose) as per <i>Koshtha</i> and <i>Agni</i>	3-7 days (Depending upon the appearance of <i>Samyaka-Snigdghata Lakshanas</i>)
<i>Abhyanga and Swedana</i> ,	<i>Nirgundi Taila</i> and <i>Sarwanga Bashpa Sweda</i> with <i>Dashmool Kwath</i>		Days

3. Patients indicated for *Vamana and Raktamokshana* as per *Ayurvedic* classics.

EXCLUSION CRITERIA

1. Patients having chronic condition, more than 5 years
2. Patients contraindicated for *Vamana* and *Raktamokshana* as per *Ayurvedic* classics.
3. Patients having all other de-pigmentary disorders.
4. Patients having serious cardiac, renal, hepatic diseases.
5. Patients having major illness like IDDM, NIDDM which are poorly controlled and any other systemic diseases.
6. Patches due to burning, chemical explosion etc and located at region of *Guhya*(Genital region), *Panitala*(Foot soles and Hand soles), *Oshtha* (Lips), *Aekanga*, *Sarwanga*(whole body).
7. Patches with *Raktaroma & Sansakta*.
8. Patients with known drug hypersensitivity, photosensitivity,
9. Pregnant and lactating women.

INVESTIGATIONS

1. Blood –Hb %, TLC, DLC, E.S.R. etc.
2. Urine – Routine & Microscopic examination.
3. F.B.S. and P.P.B.S. examination was advised where ever it is necessary.
4. Stool macro and microscopic investigation will carry out to ascertain the presence of *Krimi* if any. (If required)
5. Wood's lamp test. (If required).

DIAGNOSTIC CRITERIA

A diagnosis was made on the basis of classical signs and symptoms of *Shwitra* (Vitiligo) described in *Ayurvedic* texts & Modern medical science.

PLAN OF STUDY

Grouping: Patients were allocated by using computer generated randomization method. In present study two groups were there, each group were having minimum 15 patients.

Group 'A' – In this group after classical *Vamana Karma*, oral administration of *Shamana Sneha* in the dose of 20 ml/day were given for the duration of 4 weeks with warm water as *Anupana*.

VAMANA KARMA

Vamana Karma followed by *Shamana Chikitsa*. *Kritvedhanadi Yoga Vamana* were administered in patients of group "A".

Pradhan Karma

- **Aakanthpan** - By Dugdha
- **Vaman dravya**
Kritvedhana Bija Churna-6 Gm
Vacha Churna-3gm
Saindhava- 1gm
Madhu-Q.S.

After giving *Vamana Aushadhi* wait for one *Muhurt*

- **Vamanaopaga Dravya:** *Yastimadhu Phanta*
- **Time of procedure:** Early morning

Paschata Karma**SAMSARJANA KRAMA**

- As per the observations during the *Vamana* process, the nature of *Shuddhi* were decided (*Pravara*, *Madhyama* or *Avara*) and the *Samsarjana Krama* were decided according to the *Shuddhi*.
- The regimen of 7, 5 or 3 days shall be fixed according to the *Shuddhi*. The sequence of *Peya*, *Vilepi*, *AkritaMudgaYusha*, *KritaMudgaYusha*. were served for 3, 2 or 1 *Aahar Kala* according to the type of *Shuddhi*.
- All these foods were prepared according to the methods described in standard *Ayurvedic* texts.

SHAMANA YOGA

Somraji Ghrita orally as *Shamana Yoga* in the dose of 20 ml/day for the duration of 4 weeks with warm water as *Anupana*.

Group 'B' – In this group after *Raktamokshana Karma*, oral administration of *Shamana Sneha* in the dose of 20 ml/day were given for the duration of 4 weeks with warm water as *Anupana*.

PROCEDURE

- **Siravedh** – One sitting in a week. (Total 4 sitting during whole study)
- **Materials:** *Snigdha Yavagu*, *Taila (Abhyangarth)*, *Nadi Swedana Yantra*, scalp vein (NO. 20/24), Gauge, measuring glass, Kidney tray, Antiseptic lotion, *Raktasthambhaka Yoga (Sphatika, Gairika, Haridra)*, Bandage, Cotton, Emergency kit (if needed).

Site: Maximum protruded vein from affected area was selected for the *Siravedh*.

Purva Karma

- *Snigdha Yavagupaan*
- After that *Sarvang Abhyanga* and *Sarvang Nadi-Swedana*

Pradhana Karma

- Tourniquet were tied above the affected part until the procedure is completed.
- Look for protruded vein around the affected part.
- *Siravedhana* were carried out by scalp vein (NO. 20/24).
- In this procedure we were letting approximate less

than 270ml of blood during one sitting.

Paschat Karma

- After the complete stoppage of bleeding Bandage were applied.
- The lukewarm & light diet were given to the patients for *Agni Deepan*.

FOLLOW UP

After completion of the treatment, patient was advised to visit weekly for follow up for 4 weeks.

ETHICAL CLEARANCE

Study was started after obtaining Ethical clearance from Institutional Ethical Committee, Vide Certificate. No.108 dated 01/08/2018.Govt. Akhandanand Ayurved College, Ahmedabad.

“CTRI” REGISTRATION

This clinical trial was registered under CTRI (Clinical Trials Registry of India) with CTRI no CTRI/2019/02/017463.

CRITERIA FOR ASSESSMENT

- Result was assessed on the basis of relief in the signs & symptoms of *Shwitra* by specific scoring pattern adopted from WHO Scoring of *Ayurveda*, G.A.U. VASI score was used for assessment of result in signs and symptoms of *Vitiligo*.

The total effect of the therapy was assessed considering the overall improvement in signs and symptoms. For this purpose, following categories were maintained.

Table 2: Criteria for Assessment of Overall effect of the therapy (subjective parameter and VASI score wise).

Percentage	Effect of therapy
0-25	Unchanged
26-50	Mild improvement
51- 75	Moderate improvement
76-99	Marked improvement
100	Cured

OBSERVATIONS AND RESULTS**Statistical Analysis**

The information gathered on the basis of above observations was subjected to statistical analysis. The Wilcoxon rank sum test has been carried out for all data to analyze the effect of individual therapy in the both groups. Mann Whiteny test has been used to compare the effect of therapies of the two groups all data. The obtained results have been interpreted as.

- Insignificant P >0.05
- Significant P < 0.05
- Highly Significant P < 0.001

IN GROUP-A

15 patients were treated with *Vamana* and *Shamana*. It showed that this therapy provided highly significant relief in *Mandalotapatti*(47%), insignificant relief in *Rukshata*(30%) insignificant relief in *Saparidaha*(46%), insignificant relief in *Bahalatva*(67%), highly significant relief in *Kandu*(95%).

In Signs, in group A Highly significant difference was found in **VASI** Score, was decreased by 19.87%.

IN GROUP-B

15 patients were treated with *Raktamokshana* and *Shamana*. It showed that this therapy provided highly significant relief in *Mandalotapatti*(45%), highly significant relief in *Rukshata*(92%) significant relief in *Saparidaha*(91%), insignificant relief in *Bahalatva*(27%), highly significant relief in *Kandu*(91%).

In Signs, in group B Highly significant difference was found in **VASI** Score, was decreased by 22.24%.

Comparison between two groups

There was statistically insignificant different between two group in chief symptoms like, *Mandalotapatti*, *Rukshata*, *Saparidaha*, *Kandu*. Highly significant different between two group in chief symptoms like *Bahalatva*.

There was statistically insignificant different between two group in Signs **VASI** Score.

Summary of overall effect of therapy

- ✓ **Complete Remission** was observed in no patients in all the groups.
- ✓ **Mild Improvement** was found in 9 (60%) patients in group A, 6 (40%) patients in Group B.
- ✓ **Moderate Improvement** was found in 0 patients in Group A, 1 (6.66%) patient in Group B.
- ✓ **Unchanged Improvement** was found in 6 (40%) patients in group A, 8(53.33%) patients in Group B.

Table 3: Comparison of effect of therapies of chief complaints in Group A (n=15) and Group B (n=15) (Wilcoxon test).

Complaints	G r.	N	Mean		Mean Diff.	% Relief	SD	SE	W	P	S
			BT	AT							
<i>Mandalotapatti</i>	A	15	2.53	1.33	1.20	47	0.56	0.14	105	0.0001	HS
	B	15	2.66	1.46	1.20	45	0.67	0.17	91	0.0002	HS
<i>Rukshata</i>	A	15	0.20	0.13	0.06	30	0.25	0.06	1	< 0.05	IS
	B	15	0.8	0.06	0.74	92	0.59	0.15	55	0.002	HS
<i>Saparidaha</i>	A	15	0.13	0.06	0.06	46	0.25	0.06	1	> 0.99	IS
	B	15	0.73	0.06	0.67	91	0.89	0.23	21	0.031	S
<i>Bahalatva</i>	A	15	0.4	0.13	0.27	67	0.45	0.11	10	0.125	IS
	B	15	1	0.73	0.27	27	0.45	0.11	10	0.125	IS
<i>Kandu</i>	A	15	1.4	0.06	1.34	95	0.89	0.23	66	0.001	HS
	B	15	1.46	0.13	1.33	91	0.81	0.21	78	0.0005	HS

S-Significant, HS- Highly Significant, IS- Insignificant

Table 4: Intergroup Comparison of Group A & Group B for Subjective Parameters. (Mann-whitney test)

No.	Complaints	No.	Mean Diff.	SD	SE	U	P	S
1.	<i>Mandolatpatti</i>	A	1.20	0.72	0.18	99.50	0.59	IS
		B	1.20	0.74	0.19			
2.	<i>Rukshata</i>	A	0.06	0.35	0.09	105	0.75	IS
		B	0.74	0.25	0.06			
3.	<i>Saparidaha</i>	A	0.06	0.25	0.06	112.5	0.98	IS
		B	0.67	0.25	0.06			
4.	<i>Bahalatva</i>	A	0.27	0.35	0.09	45	0.005	HS
		B	0.27	0.45	0.11			
5.	<i>Kandu</i>	A	1.34	0.25	0.06	105	0.75	IS
		B	1.33	0.35	0.09			

S-Significant, HS- Highly Significant, IS- Insignificant

Table 5: Effects of therapies on semi-objective parameters on Group A (n=15) & B (n=15) (wilcoxon test)

SCORE	Gr	Mean		Mean Diff	%	Diff SD±	Diff SE±	'w'	'p'	S
		BT	AT							
VASI	A	35.53	28.46	7.06	19.87↓	3.63	0.93	105	0.0001	HS
	B	49.73	38.66	11.06	22.24↓	12.53	3.23	120	<0.0001	HS

S-Significant, HS- Highly Significant, IS- Insignificant, ↓-Decreased and ↑-Increased.

Table 6: Comparison of effect of therapies on semi-objective parameters on group A (n=15) & B (n=15) (mann-whitney test).

SCORE	Gr.	Mean Diff	Diff SD±	Diff SE±	'u'	'p'	S
VASI	A	7.06	18.93	4.88	90	0.36	IS
	B	11.06	26.94	6.95			

S-Significant, HS- Highly Significant, IS- Insignificant.

Table 7: Overall effect of therapies in Group A and Group B.

Gradations	Group A(n=15)		Group B(n=15)	
	No. of Patients	%	No. of Patients	%
Complete Remission	0	0	0	0
Marked Improvement	0	0	0	0
Moderate Improvement	0	0	1	6.66
Mild Improvement	9	60	6	40
Unchanged	6	40	8	53.33

DISCUSSION

According to classics *Shwitra* is a type of *Kilasa* and is caused by *Tridosha* and *Meda Dhatu* as *Dushya*.^[8] Because all the *Kushtha* caused by *Sapta Dushyas* where three *Doshas* are included.^[9] The condition which has white color vitiated in skin is called '*Shwitra*'. *Acharya Charaka* has listed the *Shwitra* under the *Rakta Pradoshaja Vikara*.^[10] Consequently the factor causing *Rakta Pradosha* may also be considered as causative factors of *Shwitra*. *Viruddha Ahara* (incompatible diet) is mentioned as the prime causative factor of *Kushtha* in general and *Shwitra* in particular. These incompatible foods are responsible for the formation of *Ama* (exogenous toxic source). *Ama* may interfere with absorption of nutrients which accepted as one of the etiological factor for *Vitiligo*; as prolonged consumption of diet poor in protein and cupromineral was thought to be contributory factor for *Vitiligo*.^[11] *Charaka* stated that *Papakarma*, *Guruninda*,^[12] unlawful acts and *Harita samhita* mentioned stealing of silver are causes for *Shwitra*. There is no logic to see these things as a *Nidana* in present days. But these may induce stress in the patients and become *Vyanjaka Hetu* for triggering of further depigmentation and also is observed that sudden emotional trauma and repression have been noted to be responsible for very sudden onset of and rapid spread of lesion.^[13]

In *Ayurveda* *Agni* (digestive fire) plays key role in any disease. In *Vamana Karma* to digest *Sneha*, *Agni* is most important factor, so for increasing efficacy of *Agni*, *Deepana-Pachana Karma* is necessary. For the purpose

of *Deepana* and *Pachana*, *Panchkola churna* was given. *Panchkola* is uniform powder combination of five drugs i.e. *Shunthi*, *chavya*, *chitraka*, *pippali moola* and *Pippali*. All ingredients of *Panchkola* have *Deepana*, *Amapachana* (potent to digest *Ama*), *Kaphaghna*, *Kushthaghna* (ruin the skin diseases) and *Krimighna* (wormicidal) properties.^[14]

The drug selected for this study was '*Kritavedhanadi Churna*', because of its easily availability, less complication and easy to administer in the patients. Pharmacodynamics of *Kritavedhanadi Churna* is *Rasa-Tikta*; *Guna - Laghu*, *Ruksha*, *Tikshana*; *Veerya - Ushna*; *Vipaka - Katu*. The *Vamaka Yoga*, after its ingestion reaches the heart and spreads all over the body due to its *Vyavayi Guna* and *Anutwa Bhava* (*Anutwamcha Anumarga Samcharitwam*) of *Sukshma Guna*. The drug after attaining its optimal concentration at the desired sites separates and liquefies the stagnated *Doshas* and *Dushyas* in microcirculation, due to its *Guna*. Then these liquefied *Doshas* and *Dushyas* migrate into the *Koshtha*, the migration of vitiated *Doshas* and *Dushyas* from *Shakha* to *Koshtha* is because of *Anu Pranavabhava* (*Pranavatwam Iti Kosthagamano Mukhatwam*) quality of *Vamaka Dravya*. The *Doshas* after their migration into the *Koshtha* will move in upward direction due to the *Prabhava* (*Vamana*) of *Vamaka Yoga*. The *Panchabhoutika* combination (*Agni+Vayu*) of *Vamana Dravya* will also help in accelerating the upward movement of *Doshas*. Then these *Doshas* are eliminated through emesis by the action of *Udanavaya*. So the patients suffering with *Shwitra* will attain homeostasis of *Dosha*, *Dhatu* and *Malas*, in

the presence of *Nidanaparivarjana* (avoiding the defaults of diet and life style).

The conventional *Siravyadh* procedure by *kutharika shastra* was modified by utilizing 20 number disposable scalp vein as equipment; which was easily available and found suitable. There is no problem of septic precautions also. In ancient time *kutharika* and *trikaurcha* were used which are very crude methods. In present era it is practically not possible because the use of *kutharika shastra* may cause injury to posterior wall of vein during procedure which leads to subcutaneous hematoma. The patient also will not get ready for such procedure due to delicate body structure.

Siravedh is predominantly indicated in *pitta*, *rakta* and *kaphaja vyadhies* or when *Pitta* or *kapha* is in *anubandha* to *vata dosha*. In such conditions of *vata prakopa* due to *kapha* and *pitta avarana*, *Siravedh* can help to remove the *avarana* of *pitta* and *kapha dosha* giving way for *anuloma gati* of vitiated *vata* that indirectly cures the *vatika* symptoms along with symptoms produced by *kapha dosha*.

A preparation of *Bakuchi* (*Psoralea corylifolia*), *Guggulu* (*Commiphora Mukul*), *Amalaki* (*Emblica officinalis*), *Haritaki* (*terminalia chebula*), *Bibhitak* (*terminalia bellirica*), *Nimb* (*azadiracta indica*), *Devdaru* (*cedrus deodara*), *Parpat* (*fumaria vaillantii*), *Kantakari* (*solanum surratence*), *Patol* (*trichosanthes dioica*), *Trayamana* (*geniana kurroo*), *Duralabha* (*fagonia cretica*), *Khadira* (*Acasia catechu*) was selected for the present study. (*Bhaishhya ratnavali- kushtha adhyaya*).

These drugs act on *Rasa*, *Rakta*, *Mamsa* and *Meda dhatus*.^[15] *Shwitra* which is having *Rakta*, *Mamsa* and *Meda* as the *Dushya* (spoiled elements), therefore *Somraji ghrita* was selected in for *Shamana* and administered in *liquid* form.

CONCLUSION

- *Shwitra* characterized by white patches which effectively resembles and represents Vitiligo according to modern science.
- Most of the patients of *Shweta Mandala* (hypo pigmented or white coloured patches) instead of any other symptoms of *Shwitra* and visit hospital for same.
- *Viruddha Ahara* (incompatible diet) like milk with salt, milk with sour foods, milk with fish, excess taking of fermented foods were observed in most of patients of *Shwitra*.
- *Raktamokshana* (*Siravedh*) and *Shamana sneha* of *Somraji ghrita* (Group B) therapy showed better results in symptoms like *Saparidaha* and *Rukshata* and VASI score than *Vamana* and *Shamana sneha* of *Somraji ghrita* (Group A) therapy.
- Group A showed better effect on *Mandalotpatti*, *Bahalatva* and *Kandu* like symptoms.

- Group B presented better repigmentation response on face, neck, dorsa of hands and ankles and didn't respond on distal extremities and on *Sansrishta* (mixed one another patches).
- *Raktamokshana* group percentage wise showed better result in VASI score as compare to *Vamana* group.
- Overall, 60% patients showed mild improvement, 40.00% patients showed unchanged improvement in Group A. Overall 6.66% patients showed Moderate improvement while 40% patients showed Mild improvement in Group B.
- Therapeutically, both the groups (Group A- *Vamana* and internal application of *Somraji ghrita*) and Group B- *Raktamokshana* (*Siravedh*) and internal application of *Somraji ghrita*) provided considerable symptomatic relief. However, Group B (*Raktamokshana* group) was found to be relatively more effective percentage wise in the management of majority of the symptoms and on quality of life.
- Hence, it is concluded that, "***Vamana and Raktamokshana Karma along with Somraji Ghrita are equally effective in the management of Shwitra***".

REFERENCES

1. Agnivesha, Charaka Samhita, revised by Charaka & Dridabala with The Ayurveda Dipika Commentary Edited by Vaidya J. T. Acharya, Edition 2016, Chaukhambha Publications, New Delhi. Sharira Sthan 1/30 Pg. no. 289.
2. Louise K. Andersen, and Mark D. P. Davis et al. The Epidemiology of Skin and Skin-Related Disease: A Review of Population-Based Studies from the Rochester Epidemiology Project published in Mayo Clinic Proc, 2013 Dec; 88(12): 1462–1467.
3. Christophers, E. (2001), – epidemiology and clinical spectrum. Clinical and Experimental Dermatology, 26: 314–320. doi: 10.1046/j.1365-2230.2001.00832.
4. Lebwohl, M, koo, JY., Elmets, C.A., Korman, N.J, Beutner, K.R., Bhushan, R.(May 2008). "Guidelines of care for the management of psoriasis and psoriatic arthritis: section 1. Overview of psoriasis and guidelines of care for the treatment of psoriasis with biologics". J Am Acad Dermatol, 58(5): 826-50. doi: 10.1016/j.jaad.2008.02.09. PMID1842260.
5. Agnivesha, Charaka Samhita, revised by Charaka & Dridabala with The Ayurveda Dipika Commentary Edited by Vaidya J. T. Acharya, Edition 2016, Chaukhambha Publications, New Delhi. Charaka Samhita Sutra Sthana, 16/20. Pg.no. 97.
6. Agnivesha, Charaka Samhita, revised by Charaka & Dridabala with The Ayurveda Dipika Commentary Edited by Vaidya J. T. Acharya, Edition 2016, Chaukhambha Publications, New Delhi. Charaka Samhita Chikitsa Sthana 7/29. Pg.no.451.
7. Agnivesha, Charaka Samhita, revised by Charaka & Dridabala with The Ayurveda Dipika Commentary Edited by Vaidya J. T. Acharya, Edition 2016,

- Chaukhambha Publications, New Delhi. Charaka Samhita Chikitsa Sthana 7/41. Pg.no.452.
8. Sushrut Samhita (Ambikadatt shashtri) nidan sthan 5/32.
 9. Agnivesha, charaka, dradhabala, charaka samhita, charaka chandrika hindi commentary, chikitsa sthana, chapter 7, verse 174, edited by Tripathi B, Varanasi: Chaukhambha surbharati Prakashana, 2009; p.333.
 10. Agnivesha, charaka, dradhabala, charaka samhita, charaka chandrika hindi commentary, chikitsa sthana, chapter 7, verse 9, edited by Tripathi B, Varanasi: Chaukhambha surbharati Prakashana, 2009; p.301.
 11. Charaka Samhita Sutra Sthana 26/103
 12. R.G. Valia, ed. Text book and atlas of dermatology Vol 1, 1st edition, 22nd chap. p. 518.
 13. Charaka Samhita Chikitsa Sthana 7/177.
 14. R.G. Valia, ed. Text book and atlas of dermatology Vol 1, 1st edition, 22nd chap. p. 519.
 15. Sharangdhara, Sharangdhara samhita, Dipika hindi commentary, Madhyam khanda, Chapter 6, Verse 12, Edited by Tripathi B, Varanasi: Chaukhambha Surbharti Prakashan, 2011; p.174.
 16. Bhavmishra-Bhavaprakash, Vidyotini teeka, Sh.Brahmashankar Shastri, Ed. Chaukhamba Publicatoin, Varanasi reprint 2012. Nigthantu.