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A CLINICAL STUDY ON THE ROLE OF ORAL INTAKE OF *BAKUCHI CHURNA* AND LOCAL APPLICATION OF *AVALGUJBEEJADI LEPA* IN THE MANAGEMENT OF *SHVITRA* W.S.R. VITILIGO

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ABSTRACT

Shvitra is a miserable disease of the skin which not only brings physical impairment to the body but causes mental impairment too. *Shvitra* is supposed to be the result of the *mithya aahara vihara, purva janmakrita karma* and *paap karma*. It is *Twakagata raktaja vikara* described among the varieties of *Kushtha*. *Shvitra* can be correlated with Vitiligo to certain extent in contemporary system of medicine. So, to find out an Ayurvedic treatment of the disease following research has been undertaken with following aims & objectives. **Aims and Objectives**: To evaluate the efficacy of *Bakuchi churna* and *Avalgujbeejadi Lepa* in the management of *Shvitra* w.s.r. to Vitiligo.

Material and Methods: For the clinical trial 20 clinically diagnosed patients of *Shvitra* were selected from O.P.D./ I.P.D. of Dept. of *Panchakarma* of Rishikul Campus, Haridwar. Oral administration of *Bakuchi Churna* and local application of *Avalgujbeejadi lepa* on *Shvitra* patches was administered. Period of study was for 60 days along with follow up after two month. Assessment was done on the basis of improvement in Symptoms of *Shvitra* like *Tvaka Vaivarnyata, Daha, Kandu, Roma vaivarnyata* and other Objective parameters like Color, Margins, Size, Percentage body involved, Number of Patches and VASI Score. Obtained results were analyzed statistically and significance of results was evaluated. (Graph-pad Instat 3.10). **Results and Discussion:** The observation of the effect of the therapy was encouraging. 27.77% patients got moderate improvement, 22.22% patients got Mild Improvement while 11.11% patients got Marked improvement.

KEYWORDS: Shvitra, Vitiligo, Bakuchi Churna, Avalgujbeejadi Lepa.

INTRODUCTION

Shvitra is the common depigmentation disorder described among the varieties of *Kushtha*. *Shvitra* though not produces direct physical impairment; it may considerably influence psychological well-being of the affected. *Shvitra* is frequently correlated with vitiligo. The incidence of vitiligo is found to be 0.25 to 2.5% in India.[1] Vitiligo *may start at any age but usually seen in childhood at 10 years of age or in second decade of life.*[2] Normal skin color of the skin is called the Melanin. It is produced inside special cell called Melanocyte.[3] When the melanocytes in localized area of the body stop producing melanin it result in depigmentation referred to as vitiligo or it is cutaneous condition with localized loss of pigmentation.[4] In vitiligo the extent of involvement may vary from a single small macule to almost entire skin and mucous membrane.[5] Normal skin color is depends on hemoglobin (in both the oxygenated and reduced state), carotenoids and melanin pigment.

Vitiligo is a common disorder of unknown etiology even today and is considered to be based on auto-immunity.[6] The gene mutated in vitiligo is NALP1.[7] It is an acquired condition in which circumscribed de-pigmented patches develops. Worldwide prevalence of vitiligo is observed as 1% of the world population.[8]

Despite the disease is dated back to years, till date no single, effective treatment is on record. The newer modalities like laser therapy, phototherapy, placental extracts and corticosteroids are used with varying degree of success and poses difficulty in generalization.[9] More over in the last decade there is an increasing interest in the psychological effects[10] of various skin diseases and quality of life of patients suffering from these diseases. *Ayurveda* advocates use of purification measures (*Panchakarma*) along with many topical/systemic drugs administrations for effective management of *Shvitra*. It is not possible for all the patients to take shodhana chikitsa prior to administration of shamana chikitsa. Hence this study aims to analyzing and assessing a specific treatment advocated for *Shvitra* as per *Ayurvedic* texts. So, for the present study oral administration of *Bakuchi Churna* and local application of *Avalgujbeejadi lepa* has been undertaken as per reference of *Chakradatta* Chapter 50.

MATERIAL AND METHODS

Aims and Objectives

➢ To evaluate the efficacy of *Bakuchi Churna* and *Avalgujbeejadi Lepa* in the management of *Shvitra*.

Selection of The Patients: 20 patients of *Shvitra* were selected from the O.P.D/I.P.D of Dept. of Panchkarma, Rishikul Campus, Haridwar on the basis of inclusion and exclusion criteria depending on the detailed clinical history, physical examination and other necessary investigations irrespective of their caste, creed and gender.

Inclusion Criteria

- Vitiligo with classical sign and symptoms.
- Age group 15 to 70 years.

Exclusion Criteria

- Pregnant women and lactating women.
- Vitiligo linked with other diseases i.e Hypertension, Diabetes, Tuberculosis, Rheumatoid Arthritis, Anemia.
- Patches over genital areas.
- Known cases of leprosy.
- Rapidly spreading vitiligo patches and associated with blisters and rubor during treatment.
- Vitiligo patches complicated by eczema and burns.
- Extensive and complete dipigmented Vitiligo.
- *Congenital pigmentation disorders.*

Criteria for Dropping out from Trial

- Personal matters
- Aggravation of complaints
- Intercurrent illness
- Any other difficulties
- Leave against medical advice (LAMA)

Diagnostic Criteria: As per the clinical features of *Shvitra* mentioned in *Ayurvedic* classics and as per the latest modern criteria for the assessment of vitiligo.

Investigations

- Hemoglobin %
- TLC, DLC
- Random blood sugar
- Erythrocyte sedimentation rate (ESR)

These investigations were done in all the patients before and after completion of the treatment to rule out any other pathological condition and to see any adverse drug reaction during the trial period.

Period of Study: 60 Days.
Follow up period: 60 Days.

Study Protocol: Partial single blinding protocol was followed in *Lepana Karma* in which drugs were not disclosed to the patient. The study protocol was reviewed and approved by an Institutional Review Board at the college level and an ethical clearance was obtained from the Institutional Ethical Committee. From patients, written informed consents were taken before the commencement of the study. The importance of adherence to the treatment, *Pathya-Apathya* associated with the disease, dates for visits and schedule for follow up were issued to the patients.

Study Methodology: Demographic data was collected from the registered patients along with baseline assessment as per the proforma. Periodic assessment of the signs and symptoms was done at the interval of 15-15 days. A follow-up assessment was done after 2 months to check the recurrence or any associated complain after withdrawing the therapy.

Intervention Given: 20 patients of *Shvitra* were treated with oral administration of *Bakuchi Churna* and *local application of Avalgujbeejadi Lepa* in the following manner.

Procedure	**Drug & Dose**	**Duration**
Oral administration	*Bakuchi Churna* 1-3 gm O.D	8 weeks
Lepana Karma	*Avalgujbeejadi lepa* Q.S.	Applied externally up to the blister formation or maximum for 8 weeks.

Assessment Criteria: The improvement in the patients was assessed on the basis of relief in signs and symptoms of the disease. All the signs and symptoms were given scoring depending upon their severity to assess the effect except VASI which was directly calculated

by using the formula (VASI= Σb[HAND UNITS] × [RESIDUAL DEPIGMENTATION]) specifically after each visit of the patient for the better assessment of the trial methodology used. For the assessment of the involvement of body surface area, the Rule of Nine described in the Forensic Medicine was used with certain modifications. The whole body was scored as per the text as per the Rule of Nine, but looking to the nature of the disease, score was further specified to the organs as follows.

Involved Body Part		**Percentage**	**Subtotal**	**Total**
Head and Neck	Scalp	2.0		9
	Face	5.0		
	Neck	2.0		
Thorax	Dorsal	9.0		18
	Ventral	9.0		
Abdomen	Trunk	9.0		18
	Back	9.0		
Upper Limbs (Right+Left)			(9R+9L)	18
	Finger to elbow		(4.5R+4.5L)	
	Dorsal	2.25		
	Ventral	2.25		
	Elbow to shoulder			
	Dorsal	2.25		
	Ventral	2.25		
One Lower limb			(18R+18L)	36
	Finger to Knee		(4.5R+4.5L)	
	Dorsal	4.5	9	
	Ventral	4.5		
	Knee to leg		9	
	Dorsal	4.5		
	Ventral	4.5		
Perineal Part		1.0		1.0

Sign & Symptoms	**Score**
1) COLOR	
Normal skin colour	0
Red colour	1
Red to pale	2
Pale to white	3
White	4
2) Margin	
Normal Skin color attributed	0
Hyper-pigmented thick broad with graduated margin	1
Hyper-pigmented broad with graduated margin	2
Hyper-pigmented well defined margin	3
Hyper-pigmented thin edge margin	4
Well-defined margin	5

3) Area	
<0.12%	0
0.12-0.25%	1
0.26-0.50%	2
0.51-0.75%	3
0.76-1.0%	4
>1.0%	5
4) Size	
0.1-0.5 cm	0
0.6-2.0 cm	1
2.1-4.0 cm	2
4.1-6.0 cm	3
6.1-8.0 cm	4
>8.0 cm	5
5) Number	
No patch	0
Upto 2 patch	1
Upto 3 patch	2
Upto 4 patch	3
Upto 5 patch	4
>5 patch	5
6) VASI VASI= Σ [HAND UNITS] × [RESIDUAL DEPIGMENTATION]	
7) *Tvaka Rukshata*	
Normal Skin dryness	0
Mild Skin dryness	1
Moderate Skin dryness	2
Severe Skin dryness	3
8) *Daha*	
No Burning sensation	0
Mild Burning sensation	1
Moderate Burning sensation	2
Severe Burning sensation	3
9) *Kandu*	
No itching	0
Mild	1
Moderate	2
Severe	3
10) *Roma Vaivarnyata*	
Absolute normal hair colour	0
Slight discoloration	1
Moderate discoloration	2
Excessive discoloration	3

VASI Score was calculated as
VASI= Σ [HAND UNITS] × [RESIDUAL DEPIGMENTATION]
In the study, the measurement of VASI needs area in palm units. Many lesions are within a palm area. So it is difficult to note it in palm units. In order to make calculation, the palms of the patients is divided into 4 parts and are considered as follows for the measurement of the lesions.
< 1/4 palm = 0.25%
1/4palm - 1/2 palm = 0.5%
1/2palm - 3/4 palm = 0.75%
3/4palm - 1palm = 1%
The extent of residual depigmentation is expressed by the following percentages: 10%, 15%, 25%, 50%, 75%, 90%, or 100%.
At 100% - Total depigmentation,
90% - no pigment is present;
75% - specks of pigment are present;
50% - the depigmented area exceeds the pigmented area;
25% - the depigmented and pigmented areas are equal;
15% - the pigmented area exceeds the depigmented area; at 15%
10% - only specks of depigmentation are present.
The VASI is then derived by multiplying the values assessed for the vitiligo involvement by the percentage of affected skin for each body site and summing the values of all body sites together.

Total score was obtained from calculation of table (1) to (10) except VASI. Maximum score was 36. Then they were divided into mild, moderate and severe category as below.

Category	Score
Mild	1 to 12
Moderate	13 to 24
Severe	25 to 36

Gradation Index for Overall Response

The overall results in grading were assessed based on the data obtained before and after the treatment. The percentage of improvement was calculated and graded in the following ways -

No improvement – Less than 25% improvement in the results.

Mildly improved – 25% to <50% improvement in the results.

Moderately improved – 50% to 75% improvement in the results

Markedly improved – More than 75% improvement in the results.

Complete relief – 100% improvement in the results.

Statistical Analysis

The obtained data was subjected to various tests. On all subjective parameters, “Wilcoxon test” was applied within groups while on objective parameters, “paired” t-tests” was applied within groups. Significance was considered as mentioned below:

P> 0.05 Not Significant

P< 0.05 Significant

P< 0.01 Highly Significant

P< 0.001 Extremely Significant

To more specifically quantify the percentage of improvement in each patient, this was also calculated using the formula (BT – AT) * 100 / BT.

RESULTS AND DISCUSSION

- Out of 20 patients 18 patients completed the trial, maximum no. of patient i.e. 35% were of age group of 16-25 years, Although vitiligo can develop in anyone at any age. But younger age person are thought to be more concerned whose life style are mostly associated with mental stress.[11]
- Maximum patients i.e. 60% were male, According to *Ayurveda* as well as modern science there is not any discrimination of *Shvitra* on the basis of sex. Male and female both are equally affected from this disease.[12]
- Maximum patients i.e 90% were from Hindu community. This reflects the geographical predominance of Hindus in Haridwar city.
- Family history was present in 25% of the patients as there appears to be several genes (such as NALP1) that cause an individual to be susceptible for developing vitiligo.[13]
- Data on educational status was collected to know the awareness among patients. 25% were having secondary education, 20% were having higher secondary education and each of the 15% patients have gained Primary education and Graduate degree. From this it can be considered that educated people are more conscious towards their appearance and disease too due to ugly look and mental stress it brings to the sufferer.
- 50% patients were doing some business/job. *Shvitra* is considered as psychosomatic disorder[14] and is found in direct proportion to stress. Persons at job, students, and house worker most commonly suffer from stress in their day to day life due to improper health and lifestyle.
- In the present study, 75% of patients were from middle class. 15% were from lower middle class and 10% were from upper middle class. From this data, it can be concluded that middle class people mostly preferred government hospitals for the management of this long running disease as its treatment modalities are quiet expensive.

- 55% patients were from Urban area. Urban lifestyle which is full of polluted air, irregular and unhygienic dietary habits and stressful routine can be one of the causes. Apart from this location of hospital in Urban region is also significant.
- 45% patients were having the chronicity in between 0-1 years. 15% patients reported to have the chronicity in between 3-4 years. Each of the 10% patients reported to have the chronicity in between 1-2 years and 2-3 years respectively. Each of the 5% patients reported to have the chronicity in between 4-5 years, 5-6 years, 6-7 years and 7-8 years respectively. It is observed that, vitiligo is chronic & spreading in nature and if treatment is not done in initial stages of the disease, it may get spread to the entire body.
- Maximum patients i.e. 70% were found to be vegetarians as Haridwar is a religious Hindu place. The maximum patients were having the habits of *Amla, Katu, Lavana Rasa* items in food with milk which is considered as a *Viruddha Ahara*. The role of *Viruddha Ahara* is well defined in *Shvitra*.
- Maximum patients i.e. 70% were taking fermented food items followed by tea, areca nuts and coffee. Above addictions in more doses can hamper digestion and can cause vitiation of *Rakta Dhatu* as well as *Rasa Dhatu. Ācārya Charaka* has clearly mentioned that *Shvitra* is a *Rakta Pradoshja Vyadhi*.[15]
- Out of 20 patients, 30% were having *Mandāgni*. In *Ayurveda* the root cause of all disease is considered to be *Agnimandhya*.
- In the present study, Each of the 45% patients were having *Krura* and *Madhyama Koshtha*. 60% patients were having a craving towards *Madhura Rasa* and 55% were fond of *Lavana Rasa while* 15% patients were having craving towards *Amla Rasa*. Each of the 5% patients were having craving towards *Katu, Tikta* and *Kashaya Rasa*. As we all know that *Madhura* and *Amla Rasa* causes *Kapha Prakopa*, also *Amla Rasa* causes *Rakta Dushti* and *Madhura Rasa* is responsible for *Krimi*. Excessive taking of *Amla, Lavana* and *Katu Rasa* causes *Pitta Prakopa*. Excessive indulgence in any of the above *Rasa* ultimately causes *Pitta Dosha Prakopa* along with *Rakta Dhatu Dushti* and results into the formation of disease in the form of *Shvitra*.
- Each of the 45% patients were taking excess *Guru Guna and Ushna Guna* primarily in their diet. Only 10% and 5% of the patients consumed the diet rich in *Sheeta* and *Snigdha Guna.* As excessive indulgence in *Guru Guna* promotes *Mandagni* which leads to the formation of *Ama*, vitiated *ama* gets circulated in the whole body through *Tiryaka Shira* and leads to the formation of *Shvitra* at the place of *Kha-vaigunya*. Excessive indulgence in *Laghu Guna*

Pradhana diet leads to *Vata Prakopa* while excessive intake of *Ushna Guna Pradhana* diet leads to *Pitta Prakopa* and *Rakta Dhatu Dushti*. All these factors plays a crucial role in the pathogenesis of disease *Shvitra*.

- Each of the 45% patients had anxiety due to their routine activities followed by stress due to some external factors. It is well established that, impact of emotional factor on skin disorder flare ups of skin condition and also patients who are stigmatized for their condition may experience depression and similar mood disorder.[16]
- Maximum 45% patients were having *Vāta-Pittaja Prakriti* while 35% were of *Pitta-Kaphaja Pṛakṛiti* and remaining 20% were of *Vāta-Kaphaja Pṛakṛiti*. Maximum of 90% patients were having *Rajasika Manas Prakriti* and remaining 10% patients were of *Tamasika Manas Prakriti*. Usually *Shvitra* is *Tridoshaja Vyadhi*[17] here maximum patients were having *Vāta-Pittaja Prakriti*. *Raja guna* is *Pravartakaha* in nature; here in the case of *Shvitra* it plays a role in determining the mental status of the individual. As Indulgence in *Mithyaahara* and *Vihara* is generally seen in people with *Raja Guna Pradhanata.*
- Among the chief variety of *Viruddhahara* as a *Nidana* Each of the 35% patients were observed in taking *Krishara+Dugdha and Amla rasa* (Sour)+*Dugdha* (Milk). *Ācāryas* have mentioned role of *Viruddha Ahara* in manifestation of *Shvitra*. Among the chief variety of *Mithya Aahara* as a *Nidana* maximum number of patients i.e. 55% were observed in taking *Ati Lavana Rasa* while 20% were observed in taking *Ati Pishttana* and only 15% were observed in taking *Ati Amla Rasa.* None of the patients were involved in taking Fermented food as *Mithyaahara.* These all such combinations and sort of foods lead to *Rakta Dhatu Dushti* hence leads to *Shvitra*. Above mentioned aetiological factors are responsible for production of *Agnimandya* and then formation of *Ama*. *Ama* is associated with *Dosha-Dushya* and circulates all over the body through *Tiryaka Sira,* finally producing the *Sanga* at place of *Kha-vaigunya*. This process plays an important role in beginning the pathogenesis of *Shvitra*.
- *Diwaswapa* (day sleep) was the aetiological *Vihara* which was found in maximum number of patients i.e. 65% of *Shvitra*. After exercise takes cold water in bath / drink instantly was found in 60% patients, 55% patients were having habit of *Vegadharana* while 25% patients reported to have *Ushna-Shita karma viruddh sevana.* Each of the 5% patients reported to have habit of doing exercise after excessive eating and *Atapa shrama bhaya ke bad shitambu sevan* respectively. *Mithya Vihara* also causes vitiation of *Agni* and *Tridosha Prakopa* thus inducing the pathogenesis of *Shvitra*.

Symptoms: All the patients had *Svetabha Vaivarnayta* as a symptom while 75% had *Mandalotpatti* (Beginning of Patch). 60% reported *Kandu* (Itching), 25% had *Rukshata* (Dryness) and 15% patients reported to have *Saparidaha* and 10% patients reported to have *Snigdhata* (Unctuousness*)* as symptom respectively. Our *Ācārya* have also mentioned the above two symptoms as the main signs of the diseases. Also above findings goes well with the fact that *Shvitra* is a *Shakhagata*[18] *Tridoshaja Vikara.*[19] Our *Ācārya* have also mentioned *Svetabha Vaivarnayta* and *Mandalotpatti* as the main signs of the disease.

Sadhya Lakshana: 100% patients had *Anagnidagdhajam* as *Sadhya Lakshana*. 85% patients had *Araktaloma,* 80% had *Asansrita,* 60% had *Tanu,* 50% had *Abahal*, *Each of the 40% patients had Navin* and *Nti chirottha* as *Sadhya Lakshana. Unnam* was present in 5% of the patients as *Sadhya Lakshana. Sadhya-asadhyata* plays very important role in the treatment of disease, presence of *Sadhya Lakshana* indicates good prognosis of the disease.

Color of Patches: Most of the patients i.e. 95% had white colored patches of skin while only 5% had pale to white colored patches of skin. None of the patient were present with red color and red to pale color patch. According to API, it is an common acquired disorder characterized by milky white macule[20], also pigment loss may be partial in some lesion.

Margins of Patches: Most of the patients i.e 65% had well defined margins while 20% had hyper pigmented thin edge margins only 5% had hyper pigmented well defined margins. None of the patients were having the hyper pigmented thick broad and hyper pigmented broad margins. In vitiligo, the macules are generally having convex border, some lesion have increased skin pigment around the edges.[21] The macules have a scalloped outline and on fusion with neighbouring lesion form geographical pattern.[22]

Number of Patches: Most of the patients i.e. 50% had 2 patches, 30% patients had upto 5 patches, each of the 10% patients had upto 3 patches and 4 patches. In vitiligo, there occurs macular patches which tends to increase with time. Initially one patch is formed and with time can evolve complete body.

Percentage Body Area Involved in Palm units: Most of the patients i.e. 35% had involved 0.26% -0.50% of the body area while 30% had involved 0.76%- 1.0% area of the body. In 15% patients > 1% area of the body has been evolved. Each of the 10% patients had involved 0.13%-0.25% and 0.51%-0.75% area of the body. None of the patients involved <0.12% area

of the body. As in vitiligo, the patches are initially small but often grow and change shape.[23,24] According to ABC of dermatology, there is loss of pigment as a result of antibodies developing against melanocytes in the skin in a limited area. However the areas affected tends to gradually increase.

Size of Patches: In the present study, each of the 35% patients were having the size of the patches in between the range of 2.1-4cm and 4.1-6cm. 15% patients were having the patch size of > 8cm. 10% of the patients were having the patches in between the size of 0.6- 2cm. None of the patient were having the patch size in between the range of 0.1- 0.5 cm. As in vitiligo, macules size ranges from 5mm to 5cm or more in diameter.[25]

Severity wise Distribution: In the present study, 75% patients had moderate type of disease while 20% patients had mild type of disease and 5% patients had severe type of disease on applying the score.

Effect of Intervention on Subjective Parameters in 18 Patients

Subjective Parameters	N	Mean Score ± S.D						% Relief	W	N	P
		BT	A1	A2	A3	A4	Mean diff.				
Color	**18**	3.8±0.5	2.9±1.02	2.17±0.72	1.94±0.9	1.6±0.87	2.2	57.89%↓	171	18	<0.001ES
Margin	**18**	4.7±0.6	4.2±0.5	3.4±0.6	2.72±0.57	2.3±0.9	2.4	50.42%	171	18	<0.001ES
Twaka Rukshata	**6**	1.5±0.84	1.5±0.84	1±0.63	0.5±0.84	0.5±0.84	1	66.66%↓	15	5	>0.05NS
Daha	**6**	1.2±0.4	1.17±0.40	1±0.63	1±0.63	1.0±0.63	0.2	14.52%↓	1	1	>0.05NS
Kandu	**10**	1.6±0.69	1.2±0.91	0.8±0.79	0.7±0.67	0.3±0.48	1.3	81.25%↓	55	10	<0.01HS
Roma Vaivarnyata	**5**	1.4±0.5	1.4±0.55	1.2±0.45	1.2±0.45	1.0±0.71	0.9	28.57%↓	3	2	>0.05NS

Above table shows that 57.89% improvement was found on Color of the patches and 50.42% improvement was found on Margins of patches. Both of these are considered Extremely significant statistically ($p<0.001$). 66.66% improvement was found on *Tvaka Rukshata* which was considered not significant Statistically ($p >0.05$), feature *Daha* was reduced by 14.52% which was considered not significant statistically ($p>0.05$). *Kandu* was reduced by 81.25% which was considered Highly Significant statistically ($p<0.01$) while *Roma vaivarnyata* was improved by 28.57% which was not considered significant statistically ($p>0.05$).

Effect of Intervention on Objective Parameters in 18 Patients

N	Assessment Parameters	Mean Score ± S.D					% Relief	T	P
		BT	A1	A2	A3	A4			
18	**Number**	2.2±1.4	2.2±1.4	2.05±1.3	1.94±1.25	1.6±1.2	27.27%↓	2.26	<0.05 S
18	**Area**	3.0±1.4	2.9±1.3	2.8±1.4	2.6±1.5	2.1±1.6	30%↓	3.8	<0.001ES
18	**Size**	2.6±0.9	2.6±0.9	2.4±0.8	2.05±0.93	1.7±1.02	34.61%↓	4.97	<0.001ES
18	**VASI**	90.5±57.4	86.5±55.1	75±51.7	66.6±53.3	58.9±55.8	34.91%↓	2.86	<0.01 HS

Above table shows Number of patches were reduced by 27.27% which was considered Significant statistically ($p<0.05$), Area of patches was reduced by 30% which was considered extremely significant statistically ($p<0.001$), on Size of the patches reduction of 34.61% was obtained which was all considered extremely significant statistically ($p<0.001$). 34.91% improvement was found on VASI Score which was considered as Highly Significant Statistically ($p<0.01$).

Overall Effect of Therapies on 18 Patients of *Shvitra*

Status	No.	%
Complete relief	0	0%
Markedly improved	2	11.11%
Moderately improved	5	27.77%
Mildly improved	4	22.22%
Unchanged	7	38.88%

27.77% patients got moderately improvement, 22.22% patients got Mildly Improvement and 11.11% patients got Markedly improvement. In Group II 38.88% patients were observed under unchanged Status.

Follow- Up

Severity	AT		After 2 months	
	No. of Pts.	%	No. of Pts.	%
Mild	13	72.22%	14	**77.77%↑**
Moderate	5	27.77%	4	**22.22%↓**
Severe	0	0%	0	**0%**

After 2 months of follow up, there was an increase in % of patients falling under Mild category from 72.22% to 77.77%, Under Moderate category there was decrease in % from 27.77% to 22.22%. No case was observed under Severe category after the treatment and also after the 2 months of completion of the trial.

Probable mode of Action of *Bakuchi Churna:* *Bakuchi* contain rich source of copper and highest amount of furocaumarin. *Bakuchi churna* have strong antioxidant properties and has

Medhya effect also.[26] *Bakuchi* increases the blood circulation locally, thus provide nutrition to the cells present there and helps in the adequate formation of *Bhrajaka Pitta* in the skin.

In *Shvitra, Srotodushti* is removed by the *Katu* and *Tikta Rasa, Ruksha Guna* and *Katu Vipaka* of the *Bakuchi.* Its psoralen content, increased the rate of synthesis and amount of melanin and hence encouraging skin to recover from a vitiliginous state.[27]

The mode of action on skin is depends on the nature of drugs used. The nature of *Ushna* leads to diminution of *Kapha* and *Vata dosha*. *Laghu* and *Ruksha Guna* subsides the *Kapha Guna*. *Katu Vipaka* helps the *Shodhana* of *Srotas*. Also *Ushna* properties help the *Agni Deepana* and *Pachana*. It has properties like *Kushthaghna, Kapha-vatahara* and making promote shining of skin.[28]

It has been reported that *Bakuchi* has the effect on Ronget's cell and melanoblast cells of skin. It stimulates melanocytes for the production of melanin. *Bakuchi* contain several types of Furocaumarins precursors such as psoralen. Furocauramins are primary photodynamic agents. They absorb long wave ultraviolet radiations after exposure to sun light and become photoactive.[29] These photoactive furocaumarins cause cell damage of the depigmented skin by inhibiting DNA synthesis, and stimulate tyrosinase activity and regrowth of melanocytes from the hair follicles. Thus furocaumarins cause dual action:

1) Removal of depigmented skin and

2) Formation of normal colored skin.

Probable Mode of action of *Avalgujbeejadi Lepa*

Content of *Avalgujbeejadi Lepa are Avalguja beeja, ¼* part *Hartala* and cow's urine. All these have conferred *Avalgujbeejadi Lepa* with the properties like *Laghu, Ruksha, Tikshna, Guru* and *Snigdha Guna, Ushna Virya* and *Katu Vipaka.* This *lepa* is also having *Sukshma* property as it has been macerated with *Gau mutra.* Upon topical application the active principle of the *Lepa* reaches to deeper tissues through *Siramukha* & *Swedavahi Srotas* and stains it with *Sukshma* and *Tikshna* property.

Rasadi Panchaka of *Avalgujbeejadi Lepa* has dominancy of *Tikta-katu Rasa, Katu Vipaka, Ushna Veerya*. However most of the *Dravyas* in this *Lepa* are *Kushthaghna, Krimighna, Deepana, Pachana, Rasayana, Tvachya & Kandughana*.[30] As *Shvitra* is *Tridoshaja Kapha Pradhana Kushtha* so this *Lepa* might have helped in *Samprapti Vighatana*.

Bakuchi, *Hartala* and Cow's urine has *Ruksha* and *Tikshna Guna*[31] so it acts on *Kleda*, *Ama* and *Kapha* and improves *Stroto-dushti* especially *Sanga*. *Hartala* has *Katu Ras, Ushna Virya, Vata-Kapha Shamaka* property and also *Rasayana* and *Varnya Karma* therefore act on *Bhrajaka Pitta* mainly involved in Coloration of skin.

Here ***Avalgujbeejadi lepa*** containing ***Avalgujbeeja churna***, psoralin containing substance the drug appears to have a purely local action with a specific effect on the arterioles of the subcapillary plexuses, which are dilated so that the plasma is increased in this area. The skin becomes red and the melanoblasts (pigment forming cell) are stimulated. In Leucoderma, melanoblasts do not function properly and their stimulation by the drug leads them to form exudates pigments, which gradually diffuse into the white leucodermic patches. The exposure of affected area of skin applied with *Bakuchi Lepa* in morning sunlight leads to favourable milieu for promoting the growth, migration and proliferation of melanocytes[32] because of the interaction of ultravoilet rays with *Bakuchi,* it not only proliferate the melanocytes but also prevents the autoimmune activity of the disease.[33] Psoralen has been found to intercalate into DNA, where they form mono and di-adducts in the presence of long wavelength UV light and thus are used for the treatment of hypo-pigmented lesion of the skin such as leucoderma.[34]

It is to be noted that Purified *Hartala*, an arsenic compound, was used in the *Lepa*. Purified *Hartala* is bestowed with immune modulating properties and is widely used for some autoimmune disorders like psoriasis, allergic bronchial asthma, etc. in which the etiopathogenesis is deranged immunity.[35] Arsenic is absorbed through skin in addition to other routes. In *Shvitra*, the deranged immune system destroys the pigment synthesizing melanocytes. *Hartala* breaks this pathogenesis and prevents the self-destruction of melanocytes.

CONCLUSION

On the basis of present work, some conclusions are drawn as follows

- Most of the patients were from younger age group (16-25 years).
- A considerable number of patients with vitiligo were found to be psychologically affected.
- Addiction of fermented food items, tea and areca nuts was found in most of the patients.
- On primary examination, *Shvetabh Vaivarnyata* was found in most of the patients along with *Mandalotpatti* and *Kandu.*
- Early pigmentation was seen if *Visphota* was developed on application of *Lepa*.

• Improvement is earlier if repigmentation starts with pigmented spots which later configured to normal skin color, when compared to repigmentation, which occurs from periphery to centre.

• The pigmentation process is earlier in small patches when compared to bigger one.

• Patches having white hairs responded late to treatment.

• The effect of *Bakuchi Churna* is very effective without any adverse effect on body on any system. The use of sunlight have additive effect to promote the melanocyte formation.

REFERENCES

1. www.medline Plus.gov>Journal List>.2(2)19 july.
2. www.medline Plus.gov>Journal List>.2(2)19 july.
3. J.S Pasricha, Ramji Gupta Illustrated Textbook of Dermatology, 4th ed, 2013; 16th chap.; pp-115.
4. Dictionary.com, Collins.11th ed, retrived Dec.06, 2012.
5. J.S Pasricha, Ramji Gupta, Illustrated Textbook of Dermatology, 4th ed, 2013; 16th chap; pp-115.
6. IBDEM pp-117.
7. Borfon, F.haynes, Anthony S. Fauci, Harrison's Principles Of Internal Medicine; 18th ed, 2012; 314th chap, pp-2657.
8. Churchill Livingstone, Davidson's Principle and Practice Of Medicine, 20th ed, 2006; 27th chap, pp-1280.
9. J.S Pasricha, Ramji Gupta, Illustrated Textbook of Dermatology, 4th ed, 2013; 16th chap.; pp-120.
10. Dermatology 1995 kayer.com.
11. http://woundcaresociety.org/does-stress-cause-vitiligo.
12. Vitiligo – Problems and Solutions Lotti T. & Hercogova J., Editors Marcel Dekker, Inc., New York (NY) 2004, page no-3.
13. http://www.ncbi.nlm.nih.gov/pubmed/16844505.
14. Vitiligo: A Comprehensive overview (part I and II) Alikan A., Felsten L.M., Daly M., Petronic-Rosic V. Journal of the American Academy of Dermatology, 65: 473 – 515, 2011.
15. Ācārya Agnivesha, Charaka Samhita, edited by Vaidya Yadavaji Trikamji, Chaukhambha Subharati Prakashan, Varanasi reprint 2011, Sutrasthana 28/12; page no. 571.

16. Picardi A, Pasquini P, Cattaruzza MS, Gaetano P, Melchi CF, Baliva G, Camaioni D, Tiago A, Abeni D, Biondi M (2003). "Stressful life events, social support, attachment security and alexithymia in vitiligo. A case-control study" Psychotherapy and Psychosomatics, 72(3): 1508. doi: 10.1159 /000069731 PMID 12707482.
17. Ācārya Agnivesha, Charaka Samhita, edited by Vaidya Yadavaji Trikamji, Chaukhambha Subharati Prakashan, Varanasi reprint 2011, Chikitsasthana 7/143,144; page no. 270.
18. Vagbhatta, Ashtanga Hridaya, edited by Dr. Brahmanand Tripathi, Chaukhamba Sanskrit Pratishthan Prakashana, Delhi, 2007, Sutrasthana 12/1; page no. 512.
19. Ācārya Agnivesha, Charaka Samhita, edited by Vaidya Yadavaji Trikamji, Chaukhambha Subharati Prakashan, Varanasi reprint 2011, Chikitsasthana 7/143,144; page no. 270.
20. YP Munjal, API Textbook of medicine Volume I, 9th ed, 2012; Section 23, 9th Chap; pp-502.
21. Huggins RH, Schwartz RA, Janniger CK (2005). "Vitiligo" (PDF). Acta Dermatovenerologica Alpina, Panonica, et Adriatica, 14(4): 137–42, 144–5. PMID 16435042.
22. Śārṅgadhara Ācārya, Śārṅgadhara Samhita with "Dipika" hindi commentary by Āddhamala, edited by Dr. Brahmanand Tripathi, Chaukhamba Surbharati Prakashana, Varanasi, 2011, Purvakhanda 4/3, page no.46.
23. Halder, RM; Chappell, JL. "Vitiligo update". Seminars in cutaneous medicine and surgery, 2009; 28(2): 86–92. doi:10.1016/j.sder.2009.04.008.PMID 19608058.
24. National Institute of Arthritis and Musculoskeletal and Skin Diseases (March 2007). "What Is Vitiligo? Fast Facts: An Easy-to-Read Series of Publications for the Public Additional". Retrieved 2010-07-18.
25. Longo, Fauci et. al., Harrison's Principal of Internal Medicine Volume I, 18th ed, 2013; 51th Chap., pp-391.
26. Bhavmishra-Bhavaprakash, Vidyotini Tika, Sh. Brahmashankar Shastri, Ed. Chaukhamba Publication, Varanasi reprint 2012. Nigthantu.
27. Wu CS et. al. "Effect of psoralen plus Ultraviolet A irradiation on cultured epidermal cells in vitro and patient with vitiligo in vivo" Br. Journal of Dermatology 2007, Jan 156(1): 122 -9 (pubmed).
28. Bhavprakasha Nighantu, hindi commented by K.C.Chunekar and G.S.Pandey, Haritakadi varga, page 123, reprint: 1999, Chaukhambha Bharti Academy Varanasi.
29. Database on Medicinal Plants Used in Ayurveda, Published by The central council of Research in Ayurveda & Siddha, New Delhi, 2001, Volume 3.

30. Bhavmishra-Bhavaprakasha, Vidyotini Tika, Sh. Brahmashankar Shastri, Ed. Chaukhamba Publication, Varanasi reprint 2012. Nigthantu.
31. Bhavmishra-Bhavaprakasha, Vidyotini Tika, Sh. Brahmashankar Shastri, Ed. Chaukhamba Publication, Varanasi reprint 2012. Nigthantu.
32. Micheal Holick "Sunlight and Vitamin D for bone health and Prevention of Auto-immune disease, Cancer and Cardiovascular disease" The American journal of Clinical Nutrition: ajcn.nutrition.org/content/8016/16785.
33. Krishnamurthi AK, Manjunath BL, Sastri BN, Deshaprabhu SB, Chadha YR. Vol. 7 New Delhi: CSIR 1969. The Wealth of India raw materials, 295-8.
34. Vaidya AD. Reverse Pharmacological correlates of Ayurvedic Drug action. Indian J Pharmacol, 2006; 38: 311-5.
35. Arsenic trioxide induces apoptosis of cutaneous T cell lymphoma cells: evidence for a partially caspase-independent pathway and potentiation by ascorbic acid (vitamin C). Michel L, Dupuy A, Jean-Louis F, Sors A, Poupon J, Viguier M, Musette P, Dubertret L, Degos L, Dombret H, Bachelez HJ Invest Dermatol. 2003 Oct; 121(4): 881-93.