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Krishna Kant Pandey
MD (Panchkarma), Chief
Consultant, Renature-
Superspeciality Ayurveda,
Haldwani, Uttarakhand, India

Arun Kumar Tripathi
Professor and Director,
Ayurvedic & Unani Services,
Uttarakhand Govt. Dehradun,
Uttarakhand, India

Alok Kumar Srivastava
Associate Professor, Dept. of
Panchakarma, Rishikul Campus,
Uttarakhand Ayurved
University, Dehradun,
Uttarakhand, India

A clinical study to evaluate the efficacy of jalaukavacarana and siddarthakadilepa in the management of mukhadusikaw.s.r. to acne vulgaris

Krishna Kant Pandey, Arun Kumar Tripathi and Alok Kumar Srivastava

Abstract

Acne vulgaris, one of the most commonly seen disease in adolescence, is a chronic inflammatory disease of pilosebaceous units, characterized by the development of comedones in forms of papules, pustules and less commonly nodules.

Mukhadusika, explained in ayurvedic texts possess symptomatic correlation with Acne vulgaris. Although vata, kapha and rakta are mentioned as dosha-duṣya involved in the pathogenesis of the disease, pittaja symptoms are also found in the disease like daha and paka.

As the disease is having a chronic nature, modern medicine's long term use results in frequent side effects, antibiotic resistance as well as high financial burden. Still, none of them permanently cures the disease and only effective until they are used with a very high relapse rate. Therefore, to identify an alternative, safer and permanent cure, jalaukavacarana and siddarthakadilepa were selected for the present study to see their effect on mukhadusikaw.s.r. Acne Vulgaris. 15 patients selected from the Panchkarma and Kaya-Chikitsa O.P.D. of the Rishikul Campus, UAU, Dehradun were treated with jalaukavacarana (4 sittings on a 7-day interval). Along with siddarthakadilepa was also applied daily in between 4 sittings of jalaukavacarana. Apart from treatment duration of 28 days, a follow-up was also done after 30 days. Assessment was done on the basis of subjective parameters i.e. piḍika (Acne lesions) grading and associated complaint grading, as well as objective parameters i.e. count of lesions. Intervention was found to be significantly effective ($p < 0.05$) in reducing piḍika grading as well as associated symptoms i.e. vedana (Pain), daha (Burning), paka (Inflammation), kandu (Itching), vaivarnyata (Discolouration) and snigdhatā (Oiliness). Intervention also showed significant result in reducing count of lesions too. However, no significant effect was seen on the no. of scar/Grading of scars. After follow-up period, only 13.33% in showed relapse in grading of acne.

Keywords: Acne, Leech Therapy, Jalaukavacharana, Mukhdushika, lepa, Herbal Paste

1. Introduction

Acne Vulgaris is a disease that affects almost 80% of individuals.^[1] It is the most common skin disease seen around the world.^[2] Mean age of onset is 18.9 years in Asians.^[3]

Acne vulgaris is a chronic inflammatory disease of pilo-sebaceous units, characterized by the development of comedones in forms of papules, pustules and less commonly nodules.

In Ayurveda, a very similar description is given is by Ayurveda stalwarts by the name of mukhadusika, due to its nature of deteriorating the beauty of one's face. And as the disease is seen in adolescent age group, yuvanpiḍika term is also given by the Acharyas.

SusrutaSamhita is the first Ayurveda text to explain mukhadusika. Disease is mentioned in most of the texts as Kṣudra-roga. Acharya Susruta have mentioned the vitiation of vata, kapha and rakta in the pathology of disease^[4]. Acharya Vagbhatta has mentioned the role of Meda in the pathology of mukhadusika which resembles with modern theory of sebum involvement in the pathogenesis of acne. Acharya Charaka has stated involvement of vitiated Pitta along with rakta in pathophysiology of piḍika^[5] (Acne lesion). So involvement of Pitta can also be considered here. As medogarbhatā^[6] (filling Meda inside the piḍika) is one of the symptoms of the disease, the causative factors which vitiate Meda can also be incorporated as Nidāna (cause) of mukhadusika. No specific symptomatology is explained in the ayurvedic texts regarding the disease.

शाल्मलीकण्टकप्रख्याः कफमारुतशोणितैः |

जायन्ते पिडिकायूनां वक्त्रेयामुखदूषिकाः ||^[7] (Su. Ni.)

The eruptions like salmali thorn, on the face during adolescence caused by vitiated kapha, vata and rakta are known as mukhadusika.

Correspondence

Krishna Kant Pandey
MD (Panchkarma), Chief
Consultant, Renature-
Superspeciality Ayurveda,
Haldwani, Uttarakhand, India

शात्मलीकण्टकाकाराःपिटिकाःसरुजोधनाः |

मेदोगर्भामुखेयूनाविज्ञेयामुखदूषिकाः^[8](A. H. Ut)

AcharyaVagbhatta has added that painful and nodular eruptions filled with Meda (sebum) inside are known as mukhadusika.

यूनामानंयुवाननं,तस्यपिडिकायुवानपिडिका | मुखंपचन्तेअतएवमुखदूषिकाइति |^[9]
(Su. Ni.)

The piḍika which occurs specifically in adolescent age group or Yuvāvasthā are known asyuvanpiḍika.

As the disease causes disfigurement of face, therefore it is called as mukhadusika.

Modern medications for acne include topical therapies; antimicrobials, hormones, surgery, U-V Irradiation, Intra lesions injections etc. having their own limitations.

While Antibiotic resistance in acne patients to doxycycline, azithromycin, clindamycin, tetracycline is also an emerging problem. But all these modern treatment modalities burn a hole in the pocket still none of them permanently cures the disease and only effective for short time with very high rate of relapse.

Looking into above facts there is a need of treatment which can prevent complications of the disease as well as reduces the recurrence effectively. Acharyas have mentioned Vamana (emesis), Virechana (purgation), Nasya (errhine therapy) and raktamokṣana (blood-letting) as sodhana (bio purification) therapy in the treatment of mukhadusikaalong with dozens of topical applications.

As Vamana Karma is an exhaustive and time consuming procedure due to its pre and post therapeutics implementations and most of the patients of mukhadusika belongs to sukumaraprakṛiti (tender nature) and student profile. So raktamokṣana is more suitable for them as a sodhana procedure. In raktamokṣana, jalaukavacarana (leech therapy) is method which is much safer, less complicated and an almost painless procedure as compared to others. Thus, it is indicated for the fearful, weak, women and tender natured people.

In Ayurveda classics, dozens of topical applications are also explained for this condition. Among that siddharthakadilepa (herbal paste) by Cakradatta/Yoga-Ratnakara as an external application was selected for the present clinical study.

So an effort was made to study the efficacy of jalaukavacarana along with lepa (herbal paste) in the management of mukhadusika.

2. Material & Methods

Patients with mukhadusikawere selected from the O.P.D. / I.P.D. department of Panchakarma& Kaya-Cikitsa, Rishikul Campus, Haridwar. The study was conducted on randomly selected patients on the basis of the criteria of inclusion and exclusion after detailed inspection of clinical history and a physical examination and other necessary / desired investigations.

Total No. of patients: 15 Patients.

Patients were given 4 sittings of jalaukavacaranaon a 7-day interval along with the daily application of siddharthakadilepa continuously for 28 days.

2.1 Inclusion Criteria

- Age: 12 – 35 years.
- Patients fit for raktamokṣana.
- Diagnosed case of mukhadusika (Acne vulgaris).

2.2 Exclusion Criteria

- Age <12 years and >35 years.
- Any other skin diseases.
- Patient with acne on regions other than face.
- Known cases of Diabetes Mellitus.
- Known cases of bleeding disorders.
- Patients not fit for raktamokṣana.

2.3 Methodology for Leech Therapy

2.3.1 Source of leeches: -All the leeches used in trial were purchased from a reputed biological product supplier, India Biologicals from Agra, UP.

2.3.2 Procedure of Leech Therapy^[10]

2.3.2.1 Preparation of the leeches: On every sitting new leeches were used for the procedure. Leeches were first prepared by keeping inharidrajala (Turmeric water), prepared by adding few pinches of haridrachurna(turmeric powder) in a kidney tray half filled with fresh water. When the leech became active i.e. move very fast in the vessel then it was taken out and transferred in to a vessel containing fresh cold water.

2.3.2.2 Preparation of patient: Patients was given mild abhyanga (external oleation) followed by vāspasvedana (steam fomentation) over the face for few minutes to increase the superficial circulation and facilitate the blood-letting. The face was then cleaned by dry cotton to remove all the greasiness over the area. After that, patient was made to lie in a comfortable position.

2.3.2.3 Leech Application: Pricks by lancet were done near the pustules/papules for application of leeches at the particular sit. Prepared active leeches were then kept over the oozing blood. When a leech was attached to a site, wet cotton pad was placed over it. In most of the patients, 4-5 leeches of 3-4 inches were used on an average, that used to suck 50-80 ml of blood.

2.3.2.4 Leech Management: Generally after 30-45 minutes, leech automatically detaches from the site.Haridrachurna (turmeric powder) was then sprinkled over the leech's anterior sucker (mouth) for inducing vomiting. Sometimes gentle squeezing of the leech was required (from its posterior sucker toward anterior sucker) to expel out the sucked blood. After expelling all the blood from its gut, leech becomes active again and stored in fresh water.

2.3.4.5 Patient Management: When the leech detaches itself from the site, there occurs a secondary bleeding from the site of bite for 2-4 hours or more. Satdhautaghrita (Purified fat) of Vaidyaratnam Oushadhsala, Ollur) was applied over the bite lesions. Few minutes later, cotton gauze pieces with were kept over the bleeding sites with firm pressure to absorb the secondary bleeding. When it got attached to the site forming a clot, patient was advised not to unplug it before next day morning to avoid any bleeding.

In few patients, in whom blood was not checking, tight compression bandaging was also done to check the bleeding.

2.4 Methodology of lepaapplication

2.4.1. Raw Drugs

1. Siddharthaka (*Brassica campestris*)
2. Vacha (*Acoruscalamus*)
3. Lodhra (*Symplocosracemosus*)
4. Saindhava (Rock Salt)

All the raw drugs were collected from a renowned crude drug supplier from Haridwar.

Raw drugs were first dried and then grinded to make a fine powder. All the drugs were then mixed in equal quantity homogeneously.

As reference for the base for preparing lepa was not provided in the Ayurveda classics, 10-15 grams of the powder was mixed with fresh-water to prepare lepa.

On the next day of jalaukavacarana, lepa was applied over the patient's face in the hospital itself. The patient was then further advised to apply the fresh lepa daily for 30-45 minutes in his/her home. Total duration for the application of lepa was 28 days initiating from the next day after 1st sitting of jalaukavacarana till 7th day after 4th sitting of jalaukavacarana. Daily fresh lepa drug was prepared for the application. Required quantity of fine powder (Approximately 10-15 gms) of the given drugs were taken in a vessel. A homogeneous paste was prepared by adding water and stirring it.

2.4.2 Procedure of lepaapplication

The patient was advised to conduct lepa in morning hours (7 to 10 am). It was conducted in three steps. Viz. –

1. The patient was asked to wash the face with lukewarm water prior to application of lepa.
2. Freshly prepared lepa was applied over the whole face in

opposite directions of hair. The lepa was applied with the thickness of 4 to 5 mm.

3. After applying the lepa, the patients were advised to wash the face with lukewarm water.

2.5 Methods of data collection: Evaluation of all the registered patients was done for the acne grading and associated symptoms. Assessment was done before the initiation of trial, and then after every 7th day of jalaukavacarana. Therefore, in total 5 assessments were done until the completion of trial followed by a 6th assessment after 30 days of trial completion to look for any recurrence.

The chief grading system used was:

- Grade-1(mild): Comedones, occasional papules.
- Grade-2(moderate): Papules, comedones, few pustules.
- Grade-3 (severe): Predominant pustules, nodules, papules
- Grade-4(cystic): Mainly cysts, abscesses, wide spread scarring.

2.6 Assessment of result

Effect of the therapies were compared before and after the treatment on the basis of self-formulated scoring scales based on subjective and objective parameters associated with the disease.

Subjective parameters:-	Objective parameters:-
<ul style="list-style-type: none"> ➤ Type of Lesion (According to grade) ➤ Scars (vranavastu), if present ➤ Kleda/snigdghata (Discharge) ➤ Vedana (Pain) ➤ Vaivarnyata (Discoloration) ➤ Sotha (Swelling) ➤ Srava (Discharge) ➤ Kandu (Itching) ➤ Daha (Burning Sensation) ➤ Paka (Inflammation) 	<ul style="list-style-type: none"> ➤ Number of Comedones ➤ Number of papules ➤ Number of Pustules ➤ Number of Nodules ➤ Number of Cysts ➤ Number of Scars (vranavastu)

Grading for subjective parameter

Pidika (Lesions):- 0- No lesion 1- Comedones, occasional papules. 2- Papules, comedones, few pustules 3- Predominant pustules, nodules, cysts. 4- ainly cysts/abscesses, widespread scarring	Snigdghata/Kleda (Oiliness):- 0- Absent /dryness 1- Alpasnigdghata (not visible) 2- Atisnigdghata (visible)
Vedana (Pain):- 0- No pain 1- Tenderness 2- Moderate pain, require local measures 3- Severe pain, unable to perform routine activity & require oral medication	Vaivarnyata (Discoloration):- 0- Absent 1- Mild discoloration 2- Severe discoloration
Sotha (Swelling):- 0- No swelling 1- Swelling but not apparent 2- Swelling obvious on the affected areas. 3- Swelling obvious on the whole face.	Srava (Discharge):- 0- No discharge 1- Lasikasrava (watery) 2- Puyasrava (thick)
Kandu (Itching):- 0- No itching 1- Mild local itching 2- Moderate local itching, resistible 3- Severe itching, irresistible	Daha (Burning Sensation):- 0- No burning sensation 1- Mild burning sensation 2- Moderate burning, resistible 3- Severe burning, irresistible
Paka (Inflammation):- 0- No pakotpatti 1- Paka with puya, without pain 2- Paka with puya with pain	Scar (vranavastu):- 0- No scars 1- Few scars visible 2- Widespread scars

2.7 Statistical Analysis: The obtained data was subjected to various tests. On all subjective parameters, Wilcoxon test was

applied, while on objective parameters, paired t test was applied.

3. Result

3.1 Distribution of patients according to chief complaint

Patient were tabulated according to grading of acne lesions (piḍika), presence of scar, course of the lesions (piḍika) along with duration & number of lesions (piḍika) & Scars (vranavastu).

3.1.1 According to grading of acne lesions (piḍika)

Table 1: Grade of acne lesions in the patients

Acne Grading	No. of Patients	%
Grade I	1	6.67
Grade II	10	66.67
Grade III	3	20
Grade IV	1	6.67

3.1.2 According to the presence of scars (vranavastu) in the patients

Table 2: Presence of scars (vranavastu) in the patients

Scar	No. of patients	%
Present	2	13.33%
Not Present	13	86.67%

3.1.3 Distribution according to associated complaints

Table 3: Distribution according to associated symptoms

Associated symptoms	Total	%
Snigdghata	12	80
Vedana	3	20
Vaivarnyata	5	33.33
Sotha	1	6.67
Srava	3	20
Kandu	13	86.67
Daha	4	26.67
Paka	12	80

3.2 Effect of jalaukavacarana along with siddarthakadilepaon chief complaint and associated symptoms

All the parameter got consistent result after each sitting of intervention i.e. jalaukavacarana along with lepa application except Scars (vranavastu). On vaivarnyata, changes were seen after 3rd sitting while there was an increase in symptoms after 3rd sitting which got reduced again after 4th sitting. sotha got increased after 3rd sitting which remained even after the completion of treatment. On vedana, srava and daha complete relief was seen after 4th sitting.

Table 4: Effect of each sitting of jalaukavacarana along with lepa application on chief complaint and associated symptoms

Parameter		Mean ± S.D.				
		BT	AT (1 st sitting)	AT (2 nd sitting)	AT (3 rd sitting)	AT (Final sitting)
Chief Complaint	Piḍika	2.20 ± 0.56	2.07 ± 0.46	1.67 ± 0.72	1.60 ± 0.63	1.07 ± 0.46
	Scar	1.00 ± 0.00	1.00 ± 0.00	1.00 ± 0.00	1.00 ± 0.00	1.00 ± 0.00
Associated symptoms	Snigdghata	1.33 ± 0.49	0.92 ± 0.67	0.58 ± 0.51	0.42 ± 0.51	0.17 ± 0.39
	Vedana	1.25 ± 0.50	1.20 ± 0.45	0.25 ± 0.50	0.50 ± 0.58	0.00 ± 0.00
	Vaivarnyata	1.00 ± 0.00	1.00 ± 0.00	1.00 ± 0.00	0.50 ± 0.55	0.17 ± 0.41
	Sotha	2.00 ± 0.00	1.00 ± 0.00	0.00 ± 0.00	1.00 ± 0.00	1.00 ± 0.00
	Srava	1.00 ± 0.00	0.00 ± 0.00	0.33 ± 0.58	0.00 ± 0.00	0.00 ± 0.00
	Kandu	1.29 ± 0.47	0.64 ± 0.63	0.57 ± 0.51	0.21 ± 0.43	0.07 ± 0.27
	Daha	1.00 ± 0.00	0.20 ± 0.45	0.20 ± 0.45	0.20 ± 0.45	0.00 ± 0.00
	Paka	1.38 ± 0.51	1.15 ± 0.38	0.62 ± 0.51	0.62 ± 0.51	0.15 ± 0.38

3.3 Effect of jalaukavacarana along with lepa application on count of lesions i.e. piḍika i.e. lesions (objective parameter)

Although in all types of lesions changes were observed after

each sitting, still pustules and nodules showed maximum change after the completion of treatment. Scars (vranavastu) were the least effected lesions due to intervention.

Table 5: Effect of each sitting of jalaukavacarana along with lepa application on count of lesions i.e. piḍika

Parameter (No. of lesions)	Mean ± S.D.				
	BT	AT (1 st sitting)	AT (2 nd sitting)	AT (3 rd sitting)	AT (Final sitting)
Comedones	20.87 ± 4.94	16.80 ± 4.25	15.47 ± 6.00	12.00 ± 4.19	8.00 ± 3.57
Papules	10.00 ± 4.26	7.33 ± 3.68	6.33 ± 3.50	4.73 ± 2.76	3.07 ± 2.43
Pustules	8.13 ± 6.16	5.40 ± 4.05	4.40 ± 5.57	3.00 ± 2.98	0.87 ± 1.30
Nodules	5.50 ± 1.29	4.50 ± 1.29	1.80 ± 0.84	1.20 ± 0.84	0.50 ± 1.00
Cysts/Abscess	2.00 ± 1.00	1.33 ± 0.58	0.67 ± 0.58	0.67 ± 0.58	0.33 ± 0.58
Scars (Vranavastu)	2.50 ± 0.71	2.50 ± 0.71	2.00 ± 0.00	1.50 ± 0.71	1.50 ± 0.71

3.4 Statistical analysis of jalaukavacarana along with lepa application result on subjective parameters (Gr. B)

Table 6: Results obtained on Chief complaint & associated symptoms

Complaint		N	Mean Score		Diff. \bar{X}	S.D. ±	S.E. ±	%
			B.T.	A.T. (final)				
Chief complaint	Pidika	15	2.20	1.07	1.13	0.35	0.09	51.51
	Scar	2	1.00	1.00	0.00	0.00	0.00	0.00
Associated Symptoms	Snigdhatta	12	1.33	0.17	1.17	0.58	0.17	87.50
	Vedana	4	1.25	0.00	1.25	0.50	0.25	100
	Vaivarnyata	6	1.00	0.17	0.83	0.41	0.17	83.33
	Sotha	1	2.00	1.00	1.00	0.00	0.00	50.00
	Srava	3	1.00	0.00	1.00	0.00	0.00	100.0
	Kandu	14	1.29	0.07	1.21	0.58	0.15	94.44
	Daha	5	1.00	0.00	1.00	0.00	0.00	100
Paka	13	1.38	0.15	1.23	0.60	0.1	93.33	

Table 7: Analysis of result obtained on chief complaint and associated symptoms (subjective parameters) by paired t test and Wilcoxon signed rank test

Complaint		't' score (paired t test)	'p' value (paired t test)	'P' value (Wilcoxon signed rank test)
Chief complaint	Pidika	12.47	<0.001	<0.001
	Scar	-	-	-
Associated Symptoms	Snigdhatta	7	<0.001	<0.001
	Vedana	5	<0.05	>0.05
	Vaivarnyata	5	<0.01	>0.05
	Sotha	-	-	-
	Srava	-	-	>0.05
	Kandu	7.84	<0.001	<0.001
	Daha	-	-	>0.05
Paka	7.41	<0.001	<0.001	

Due to intervention, 100% relief was obtained in daha, srava and vedana, although the results were not statistically significant acc. to Wilcoxon test ($p > 0.05$) but results obtained on vedana were statistically significant, according to paired t-test ($p < 0.05$). 94.44%, 93.33% and 87.50% relief was obtained in kandu, paka and snigdhatta respectively, all of which were extremely significant ($p < 0.001$) statistically. 51.51% relief was obtained in chief complaint, pidika which was also extremely significant ($p < 0.001$). 83.33% relief was

obtained in vaivarnyata, but it was statistically insignificant ($p > 0.05$). 50% improvement was seen in a single case having sotha as an associated symptom, on which no test was applicable to prove its significance. In scar grading, no relief was obtained.

3.5 Statistical analysis of jalaukavacarana along with lepa application result on objective parameters

Table 8: Analysis of result obtained on count of lesions i.e. pidika (objective parameters) by paired t test

No. of lesions	N	Mean Score		Diff. \bar{X}	S.D. ±	S.E. ±	%	't' score (paired t test)	'p' value (paired t test)
		B.T.	A.T. (final)						
Comedones	15	20.87	8.00	12.87	3.54	0.91	61.66	14.06	<0.001
Papules	15	10.00	3.07	6.93	3.06	0.78	69.33	8.78	<0.001
Pustules	15	8.13	0.87	7.27	5.39	1.39	89.34	5.22	<0.001
Nodules	4	5.50	0.50	5.00	0.82	0.41	90.90	12.25	<0.01
Cysts/Abscess	3	2.00	0.33	1.67	0.58	1.73	83.33	5	<0.05
Scars	2	2.50	1.50	1.00	0.00	0.00	40.00	-	-

Maximum relief was obtained in nodules i.e. 90.90% with a statistical significance of $p < 0.01$ (highly significant). Cysts also showed a statistically significant relief ($p < 0.05$) of 83.33%. Pustules, Papules and comedones showed an improvement of 89.34%, 69.333% and 61.66% respectively which were extremely significant statistically ($p < 0.001$). Scars (vranavastu) count also got a reduction of 40% in 2 patients but no test was applicable on the results due to small sample size.

3.6 Overall Effect of intervention on grading of chief complaint

Table 9: Distribution of patients according to grading of chief complaint before and after intervention.

Grade	BT		AT	
	No. of Patients	%	No. of Patients	%
No complaint			1	6.67%
Grade I	1	6.67%	12	80.00%
Grade II	10	66.67%	2	13.33%
Grade III	4	26.67%	0	0.00%
Grade IV	0	0.00%	0	0.00%

No case of grade III acne was found after intervention which were 26.67% before initiation of treatment. Grade II acne

cases were also reduced from 66.67% to 13.33% after the completion of intervention. In 6.67% cases, complete remission was observed due to treatment. While grade I cases were increased from 6.67% to 80.00% after the treatment completion due to reduction in no of lesions in higher grading cases. No grade IV case was seen, either before or after intervention.

3.7 Follow up Study

Follow up scoring/grading was done after 1 month of completion of treatment/intervention. Results obtained are tabulated below

Table 10: Comparison of follow up score with final scores

Grade	AT		After 1 month	
	No. of Pts.	%	No. of Pts.	%
No complaint	1	6.67	0	0.00
Grade I	12	80.00	13	86.67
Grade II	2	13.33	1	6.67
Grade III	0	0.00	1	6.67
Grade IV	0	0.00	0	0.00

After 30 days follow up period, only 6.67% (number = 1) patients showed relapse (to grade I) after having complete remission from the intervention and another 6.67% (number = 1) showed relapse from grade II to grade III. Rest 86.67% showed no increase in grading.

4. Discussion

Day by day, embellishments are increasing in a common man's lifestyle. People are becoming more conscious of their beauty and skin. Large number of researches in the field of cosmetology are also being carried out. Still, modern medical science is not able to provide a permanent and economical solution for skin disorders especially acne. The need of the hour is to provide a reasonable, effective, and safe treatment with least/no relapse. Various researches have been conducted previously on mukhadusika. Role of jalaukavacarana, Vamana and various lepa have been studied for the treatment of the disease in different institutions of India. Still, no study has been done previously to see the effect of jalaukavacarana along with lepa in mukhadusika. So to fill this lacuna this study was conducted.

Ayurveda texts have described the vata, kapha and rakta as the chief culprit dosha (bodily humor) responsible for the disease, although raktaja/pittaja symptoms are found to be more pronounced in the patients.

As piḍika is the chief complaint found in the patients, which is a rakta-dushtilakṣana. ^[11]

AcharyaVagbhata has given a term medogarbhapiḍika which can be assumed to be a lesion with whitish tinge or a lesion filled with Meda like substance i.e. sebum. On correlating this with modern description of acne lesion, this can be a closed comedone filled with sebum or a pustule.

AcharyaSusruta has described the piḍika like salmali-kantaka. As salmali-kantaka suggests a piḍika with semi-solid/solid consistency which correlates it with acne lesion- papule or nodule.

A salmali-kantaka like piḍika is suggestive of a lesion filled with puya (pus) but in apakvavastha (unripen), which shows involvement of kapha as Acharya Susruta has told that puya is not possible without kapha. ^[12] Thus, this lesion can be correlated with papule (if small) or nodule (if large). And when this piḍika becomes pakva due to the involvement of Pitta, as Acharya Susruta has mentioned that paka is not

possible without Pitta, this can be correlated with a pustule (if small) or cyst (if large).

Other than piḍika and ruja no other signs or symptoms of mukhadusika are found in the Ayurveda texts while modern medical science has explained few associated symptoms found in the disease like itching, discoloration, pain, swelling, discharge etc. As Ayurveda advocates the use of yukti (sense) in undescribed conditions, all these symptoms are obvious due to the involvement of vitiated vata, Pitta and kapha in the disease. Due to vitiation of vata, Pain (vedana), watery discharge and scar formation is possible while Pitta involvement can cause paka anddaha. Blackish discoloration (Śyāva Varna) of skin occurs due to vitiated vata. ^[13] Discoloration is also caused by vitiated Pitta because Pitta is responsible for imparting different colors to the skin. ^[14] Vitiation of kapha can lead to the formation of puya, sotha, kleda/snigdghata, ghanasrava (thick discharge) and kandu.

All these symptoms correlatemukhadusika with Acne vulgaris involving face only.

In all kṣudra-rogas, rakta-dushti is seen as the prime pathology. While raktamokṣana is advocated as the preferred method of sodhana or treatment in rakta-dushti. ^[15] As mukhadusika is also a kṣudra-roga, above statement is not an exception to it. While in many kṣudra-rogas, jalaukavacarana is directly indicated, siravedha (venepuncture) is mentioned as the preferred method of raktamokṣana in mukhadusika.

Acc. to Acharya Susruta, jalaukavacarana is the preferred method of bloodletting in bala (children), nari (female), durbala (weak), bhuru (fearful) and sukumara (tender nature).

^[16] As majority of our patients were going to be female which comes in bhuru/nari category, also the major age group in which this disease occurs belongs to sukumara category, jalaukavacarana was selected as the primary intervention.

Jalauka is also said to be the best Anusastra (used in place of sastra (surgical instrument) in those who fears from surgery) by AcharyaVagbhata. ^[17]

jalaukavacarana, being a painless procedure, is more suitable than siravedha to most of the patients.

As in mukhadusika, vitiated dosha/dhatu/mala get accumulated in srotas (Lomakupa (follicles)), causing blockages and leads to piḍika formation.

jalaukavacarana being a bio-purificatory method removes deeply seated toxins by letting out blood, clearing Srotasa and pacifying vitiated dosha.

As jalaukavacarana is the preferred way of blood-letting in sukumaraPrakriti, therefore it was selected here for raktamokṣana.

Although the amount of oozed blood in case of leech therapy is very less in comparison to tradition venipuncture, but the efficacy should not be judged by the amount of blood. Leech application not only removes blood from the site but also injects biologically active substances which help to manage various ailments. Like Hirudin and Calin, which act as anticoagulants, also preventing inflammation and slow cleansing of wound. Histamine by its vaso-dilating property allows more blood to come to the site of leech application or lesion thus replacing old stagnant blood with fresh blood. Overall, all biologically active substances render thrombolytic, anti-inflammatory and immune stimulant action. ^[18] Secondary bleeding for few hours, due to hirudin, causes removal of toxins along with increased circulation to that particular area, promoting faster wound healing without any scar formation. A healthy cell gets sick when it is deprived of needed oxygen and nutrition, and is unable to remove toxins accumulated during metabolism. Biologically

active substances in leech saliva help the cells to absorb necessary nutrition and eliminate toxins.^[19]

During leech therapy, leeches are placed directly on the site of lesion, so that they can feed directly on the pus and at the same time, more leeches are placed around the diseased area to get rid of the pooled blood. Because pooled blood causes pressure, leading to tenderness bloodletting, on the other hand, relieves the patient from pain. Also, it is already proven that leech saliva contains analgesics which may be the reason behind pain relief. It can also be assumed as the leech sucks stagnant blood, sodhana of the morbid doshavia sucked blood occurs, which in turn results in the srotosuddhi (cleansing of body channels) and trapped vata gets relieved which was responsible for the pain.

According to modern science, leech injects anti-inflammatory and bacteriostatic substances with its saliva which helps in subsiding the associated symptoms. A study revealed that *Staphylococcus aureus* bacteria, which causes infection of blood, bones and lungs, feeds on iron. Therefore, lesser the available iron in the system, less the chance of staphylococcus infection being present.^[20] Relief in infective/inflammatory conditions by jalaukavacarana can be attributed to results obtained by this study.

Jalaukavacarana is indicated by Acharyas in rakta-dushti (blood infection) with pitta involvement. In mukhadusika also, there is primarily rakta-dushti due to Pitta and kapha.

As jalaukavacarana removes vitiated Pitta/rakta, which causes reduction in paka, daha and no. of pustules & cysts. It also reduces the pooled blood and pus which results in srotosodhana. This srotosodhana causes normalization of kapha and further reducing kandu and no of comedones, papules & nodules. Srotosodhana also leads to anulomana (movement in proper direction) of obstructed vata which may be the reason for significant relief in pain.

As vitiated Pitta imparts different colours to the skin^[21] while rakta causes improved complexion^[22], sodhana of the vitiated Pitta and rakta by jalaukavacarana improves complexion by relieving vaivarnyata which might be the reason behind the reduced vaivarnyata in the patients involved in this study.

Siddarthakadilepa, used as the additional intervention, was possessing drugs with usnavirya (hot nature) and srotosodhaka properties which pacifies the vitiated kapha and similar dhatu (meda).

Saindhava due to its sukṣma (micro) guṇa (property) & vyavayi (very fast spreading) guṇa, penetrates minute channels clearing the Srotāvarodha and causes viṣyandana of the kapha & similardhatu, thereby reducing the kaphaja lesions i.e. comedones and papules as well as kaphaja symptoms especially snigdghata. Tikṣṇa & lekhanaguṇa of Vacha must have helped in reducing medogarbhata (filled with sebum) by penetrating micropores and further reducing accumulated kapha and Meda inside them and ultimately reducing no of comedones, papules and nodules. Siddarthaka by its Krimighna property must have controlled the infection and due to its kaphaghna property, reduction in itching (kandu) and snehadhikya (excessive oiliness) was seen. Kaṣayatva of Lodhra must have helped in reducing srava (Discharge) as well as snehadhikya. As sotha was also resolved in one patient which can be attributed to the sothahara property of Vacha. Vranasodhaka (wound cleansing) property of Saindhava and vranaropaṇa (wound healing) property of Lodhra promotes faster healing of lesions without leaving scars which was seen as the effect of intervention. Vacha having shulahara (analgesic) properties must have provided additional benefit along with jalaukavacarana in reducing pain (vedana).

Modern Pharmaceutical studies have also identified the anti-pruritic, antibacterial; antiseptic and parasitocidal activity in Sarṣapa; hyperemic, antibacterial, analgesic, antisecretory and antiulcerogenic activity in Vacha. It was also found that bark of Lodhra possesses anti-inflammatory activity and promotes wound healing while Saindhava acts as a weak antiseptic and wound cleanser. It regulates the fluid balance of the body and restricts bacterial growth by lowering the amount of free water molecules in foods. All these facts justify the additional effect of siddarthakadilepa.

In piḍika, 51.51% improvement was seen which was maximum in nodules and pustules count i.e. 90.90% & 89.34% respectively and was statistically significant too. Scars (vranavastu) showed no improvement in grading after the intervention although total no. of Scars (vranavastu) were reduced to 40%. But this result on scars was statistically insignificant because of small sample size and might have occurred due to chance.

Cystic lesion count was also reduced by 83.33% although it was insignificant statistically. 69.33% reduction was found in papule count while a 61.66% change was seen in no. of comedones. And both these results were extremely significant statistically.

In associated symptoms, 100% relief was obtained in daha, vedana and srava, although it was statistically insignificant due to small sample size and a probability of occurring by chance was there. However, results obtained on vedana were statistically significant according to paired t-test. 94.44% and 93.33% improvement were found in kandu and paka which were extremely significant statistically. 87.50% relief found in snigdghata was also extremely significant statistically. vaivarnyata showed an improvement of 83.33% which was significant statistically according to paired t-test but was found to be insignificant when Wilcoxon test was applied. On sotha, a statistically insignificant 50% relief was observed in single case.

This intervention provided complete resolution in 6.67% of patients. Grade III lesions also got benefitted as no patients of Grade III lesions were seen after the intervention which were 26.67% before the intervention. Patients with Grade II lesions also reduced from 66.67% to 13.33%.

After 1 month follow up, the relapse rate was 13.33%. There was no grade change in 86.67% of patients after 1 month. This can be attributed to the fact apart from jalaukavacarana, lepa showed additional srotosodhaka effect due to the drugs like Vacha, Saindhava and Sarṣapa, thus avoiding the relapse.

5. Conclusion

Mukhadusikaw. s. rto modern disease Acne Vulgaris which is called to be a physically and psychologically scarring disease occurs due to vata, kapha and raktavitiation. However, pittaja symptoms are also found in the disease like daha and paka. Vataj symptoms are found to be very less or in specific patients only. Most common vataj symptom found in patients is vedana. Grade II lesions (Papulo-pustular) are the most common type found in the patients while Grade IV (with cysts and widespread scarring) are rare. snigdghata/kleda over face is the most common type of associated complaint seen in almost every patient followed by paka and daha. Sotha and srava are the least persisting associated complaint in mukhadusika patients.

Jalaukavacarana along with lepa is very effective in reduction of count of comedones and pustules. Although in this study, it also reduced the no. of papules and nodules.

Jalaukavacarana provides a sustained relief in mukhadusika with minor relapse rate and additional application of lepa must

be improving this relapse free relief to more extent.

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