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Research Article

MEDICINAL LEECH FOR THE TREATMENT OF ACNE VULGARIS W.S.R. TO *MUKHADUSHIKA*: A RANDOMISED CLINICAL STUDY

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KEYWORDS: Acne vulgaris, *Mukhadushika, Kshudra Roga, Shalmali kantak, Meda, Yuvanapidika, Jalaukavacharana*.

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ABSTRACT

Acne vulgaris is a chronic inflammatory disorder of the pilo-sebaceous follicles characterised by comedones, papules, pustules, nodules and often scars mainly seen on cheeks, chin, nose, forehead and upper trunk during adolescence. The symptoms of Acne vulgaris resemble *Mukhadushika* as per Ayurvedic classics. Acharya Sushruta has mentioned *Mukhadushika* as one of the *Kshudra Rogas*. In *Mukhadushika*, there are *Shalmali kantak* like eruptions on the face which are impregnated with *Meda* caused due to vitiation of *Kaphadosha*, *Vatadosha* and *Raktadhatu* which destroy the beauty of the face and makes the appearance ugly. The disease almost take place in adolescent and young age group prominently therefore is also known as *Yuvanapidika*. *Acharya Sushruta* stated *Jalaukavacharana* is the preferred method of bloodletting in *Sukumara*. **Aim:** To evaluate the efficacy of *Jalaukavacharana* in the management of Acne vulgaris w.s.r. to *Mukhadushika*. **Methodology:** Fourteen patients of age group 15-30 years having signs and symptoms of *Mukhadushika* were selected and four sittings of *Jalaukavacharana* on a seven day interval were given. Apart from treatment duration of 28 days, a follow-up was also done after 30 days. **Results:** Intervention was found to be highly significant ($p<0.001$) in *Vedana*, *Kandu*, *Daha*, number of *Pidika*, size of *Pidika*, *Pidika ghanata*, *Shotha, Vaivarnyata*. However, significant effect ($p<0.05$) was found in *Vranavastu* and non-significant result ($p>0.05$) was found in *Srava.* **Conclusion:** The results are satisfactory. *Jalaukavacharana* is proved to be an effective, time saving, affordable and acceptable treatment in *Mukhadushika* without causing any adverse effect.

INTRODUCTION

Face is the most important organ for reflecting the beauty of the person. This most important and beautiful organ is affected by certain anomalies in adolescence age. One of the most important anomaly is Acne vulgaris. Acne vulgaris is a chronic inflammatory disorder of the pilo-sebaceous follicles characterised by comedones, papules, pustules, cysts, nodules and often scars chiefly on cheeks, chin, nose, forehead and upper trunk that affects many adolescents during puberty.[1] It appears earlier in girls, but more boys are affected during the adolescence years; the average age for the onset of acne is 11 years in girls, affecting upto 82% and 12 years in boys, affecting upto 95%. Recently, there has been a rise in the appearance of acne in those as young as 8 or 9 years of age. This increase at such a young age has been attributed to the decreasing age of puberty onset.[2] It is a skin condition that occurs due to the clogging of oil glands of the skin.[3] The oil that normally lubricates the skin gets trapped in blocked oil ducts and results in what we know as pimples, blackheads and whiteheads. Sometimes it also includes deeper skin lesions that are called cysts.[4] Acne vulgaris mostly affects the areas of skin with the densest population of sebaceous follicles, these areas

include the face, the upper part of the chest and the back.[5] The cause of acne is unknown. It is presumed to be activated by androgens in genetically predisposed individuals.[6] According to the Global Burden of Disease (GBD) study, Acne vulgaris affects approximately 85% of young adults with age group ranging from 12-25 years.[7] The production of androgens during puberty explains in part, why Acne vulgaris is so prevalent in this population.

In Ayurveda, *Mukhadushika* has been elaborated as one of the *Kshudra Roga* (minor ailments) by various *Acharyas* and the symptoms of *Mukhadushika* resemble Acne vulgaris as per modern science. In Ayurveda classics, *Acharya Sushruta* was the first and foremost to mention a whole group of such disease of the skin *Kshudra Roga*[8] which have an adverse effect on the appearance of an individual. *Shalmali kantak* like eruptions on the face of adolescents, due to vitiation of *Kaphadosha*, *Vatadosha* and *Raktadhatu* are known as *Mukhadushika* or *Yuvana pidika* or *Tarunya pitika.*[9] These *Pidikas* destroy the beauty of the face and cause disfigurement of the face therefore are called as *Mukhadushika.*[10] *Yuvan pidika* and *Tarunya pitika* means that the disease almost take place in adolescent and young age group prominently. Ayurveda texts such as *Sushruta Samhita*, *Ashtanga Hridyam*, *Madhava Nidana*, *Sharangadhara Samhita* etc., have stated the pathophysiology and treatment of acne. According to *Acharya Vagbhata*, vitiation of *Kapha*, *Vata* and *Rakta* lead to formation of *Pitika*, this *Pitika* is filled with *Meda*, which can be explained with the term *Medogarbha* (filled with oil/sebum).[11] *Acharya Kashyapa* mentioned that *Shukra Dhatu* (semen) development occurs in the young age and there are changes in sexual characters along with formation of acne.[12] *Acharya Madhava* says *Mukhadushika* is a disease that occurs as papules resembling the sprout on the bark of the *Shalmali* tree appearing on the face and is caused by vitiated *Kapha*, *Vata dosha* and *Rakta dhatu* together which makes the face ugly and also known as *Yuvana pidika*.[13] In *Sharangadhara Samhita*, it has been mentioned that acne is caused due to *Shukradhatu mala* (waste products of semen).[14]

Raktamokshana (bloodletting) is mentioned in Ayurvedic texts as the preferred way of treatment in *Raktaja Vyadhi* (blood borne disorder) as well as dermatological disorders. *Rakta Dhatu Dushti* is one of the main pathogenic factors of *Mukhadushika* formation. *Acharya Sushruta* stated *Jalaukavacharana* is the preferred method of bloodletting in *Sukumara* (tender nature).[15] Considering adolescent age group of acne patients, the major age group in which this disease occurs belongs to *Sukumara* category. *Jalaukavacharana* being a bio-purificatory method removes deep seated toxins by letting out blood, clearing *Srotas* and pacifying vitiated *Dosha. Jalaukavacharana* possesses high efficacy in both *Shodhan* (cleansing) and *Ropana* (healing) without producing any adverse effects. It is cost effective and easy to apply. Therefore, *Jalaukavacharana* being the easiest and almost painless method can be used as a preferred way of *Raktamokshana* in *Mukhadushika*.

AIMS AND OBJECTIVES

To evaluate the efficacy of *Jalaukavacharana* in the management of *Mukhadushika* w.s.r. to Acne vulgaris.

MATERIALS AND METHODS

In this study a total fourteen patients were registered.

Selection of Patients

Patients fulfilling the criteria for selection were registered from the Outpatient department of *Shalya Tantra*, Jammu Institute of Ayurveda and Research, Nardini, Jammu and Sri Sain Charitable Trust Hospital, Pamposh colony, Janipur irrespective of gender, caste, occupation and religion.

Patient Consent

The treatment procedure with its different steps and the outcome was properly explained in detail to the patients and written consent was taken from each patient before enrolling in the clinical study.

Diagnostic Criteria

Patients were thoroughly examined both subjectively and objectively. Diagnosis was made on the basis of typical lesions found in Acne vulgaris or *Mukhadushika* i.e., comedones, papules and pustules including cysts found in advanced cases of the disease. Patients with symptoms like *Pidaka* (papules) on face including *Medogarbhatva* (impregnated with meda), *Ruja* (pain), D*aha* (burning sensation), *Srava* (discharge) etc.

Interventions

Patients were given 4 sittings of *Jalaukavacharana* on a 7 day interval.

Period of Study: 28 days.

Follow up Period: 30 days or till symptoms subside.

Inclusion Criteria

Patients between the age group 15 to 30 years irrespective of gender, caste, occupation and religion.

Patients presenting with cardinal features like *Shalmali kantakakara, Kandu, Toda* and *Ghana Yuvanpidika.* Patients fit for *Raktamokshana (Jalaukavacharana).*

Exclusion Criteria

1. Patients age less than 15 and more than 30 years.
2. Patients with uncontrolled Diabetes, Hypertension, Tuberculosis, Endocrine disorder.
3. Patients with bleeding tendency disorder.
4. Patients having skin disease like Psoriasis, Leprosy, Acne rosacea, Staphylococcal boils.
5. Patients unfit for *Raktamokshana (Jalauka-vacharana).*

Methodology for *Jalaukavacharana*

Source of leeches

All the leeches used in trial were purchased from a reputed biological product supplier from Delhi.

Procedure of *Jalaukavacharana*

All the fourteen patients were given *Jalaukavacharana* intervention.

Purva Karma

Preparation of the leeches

On every sitting, new leeches were used for the procedure. Leeches were first prepared by keeping in *Haridra jala*, prepared by adding a few pinches of *Haridra churna* in a kidney tray half filled with fresh water. When the leech became active i.e., started moving quickly in the vessel, it was taken out and transferred into a vessel containing fresh cold water.

Preparation of the Patient

Patient was advised to do self A*bhyanga* of face followed by *Ushanodaka Prakshalana* for 3 days at his/her home. While on the 4th day, the patient was given mild *Abhyanga* followed by *Vashpa Swedana* over the face for a few minutes to facilitate the bloodletting. Patient's face was then cleaned by dry cotton to remove all the greasiness over the face. After that, patient was made to lie in a comfortable position.

Pradhana Karma

Pricks by lancet were done near the location of the lesion for application of leeches at that particular site. Prepared active leeches were then kept over the oozing blood. When a leech attaches itself to the site, wet cotton pad was placed over it. In most of the patients, 3-5 leeches, 3-4 inches in size were used during each sitting that sucked 60-100ml of blood.

Paschata Karma

Leech Care

Generally after 30-45 minutes, leech automatically detaches itself from the site. *Haridra churna* was then sprinkled over the leech's anterior sucker (mouth) for inducing vomiting. Sometimes gentle squeezing of the leech was required to expel out the sucked blood. After expelling all the blood from its gut, the leech became active again and was stored in fresh water.

Patient Management

When the leech detaches itself from the site, there occurs a secondary bleeding from the site of application for 2-4 hours or more. *Shatdhauta ghrita* was applied over the bite lesions. A few minutes later, cotton gauze pieces were kept over the bleeding sites with firm pressure to absorb the secondary bleeding. When the piece got attached to the site forming a clot, the patient was advised not to remove it until the next morning to avoid any bleeding. In a few patients in whom continuous bleeding was present even on the next day, tight compression bandaging was done to check the bleeding.

***Pathya* and *Apathya* Advised During Treatment**

***Pathya*:** Green grams, rice, wheat, green vegetables, fruits, adequate sleep at night, washing face every time after coming from outside environment and before sleeping.

***Apathya*:** Oily, fried, spicy eatables, bakery item, curd, junk food, cold drink etc. *Ratrijagran, Diwaswapan*, squeezing of acne.

Criteria for Assessment

Results were assessed on the basis of Subjective and Objective parameters associated with the disease.

Table 1: Parameters for assessment

Subjective parameters	Objective parameters
• *Vedana* (pain) • *Srava* (discharge) • *Kandu* (itching) • *Daha* (burning sensation)	• Number of *Pidika* (papules) • Size of *Pidika* • *Pidika Ghanata* (hardness) • *Shotha* (inflammation) • *Vaivarnyata* (discoloration) • *Vranavastu* (scar tissue)

Table 2: Grading for Subjective parameters

***Vedana* (pain)**	***Srava* (discharge)**
0 – No pain 1 – Tenderness 2 – Moderate pain, require local measures 3 – Severe pain, unable to perform routine activity and require oral medication	0 – No discharge 1 – *Lasika srava* (watery) 2 – *Puya srava* (thick)
***Kandu* (itching)**	***Daha* (burning sensation)**
0 – No itching 1 – Mild local itching 2 – Moderate local itching, resistible 3 – Severe itching, irresistible	0 – No burning sensation 1 – Mild burning sensation 2 – Moderate burning, resistible 3 – Severe burning, irresistible

Table 3: Grading for Objective parameters

No. of *Pidika* (Papules)	**Size of *Pidika***
0 – Absent 1 – Less than 10 2 – 10 to 20 3 – >20	0 – Absent 1 – Size 2mm 2 – Size 5mm 3 – Size 10mm
***Pidika Ghanata* (hardness)**	***Shotha* (inflammation)**
0 – Absent 1 – Less *Ghanata* 2 – Moderate *Ghanata* 3 – Severe *Ghanata*	0 – No swelling 1 – Swelling but not apparent 2 – Swelling obvious on the affected areas 3 – Swelling obvious on the whole face
***Vaivarnyata* (discoloration)**	***Vranavastu* (scar)**
0 – Absent 1 – Mild discoloration 2 – Moderate discoloration 3 – Severe discoloration	0 – No scars 1 – Few scars visible 2 – Widespread scars

OBSERVATION

Table 4: Patient wise observation in Acne vulgaris

S.No.	Observation	Maximum	Percentage
1.	Age	15-20 years	64.29%
2.	Sex	Female	71.43%
3.	Religion	Hindu	92.86%
4.	Marital status	Unmarried	85.71%
5.	Socioeconomic status	Middle	57.14%
6.	Dietary pattern	Mixed	92.86%
7.	Habitat	Rural	78.57%
8.	Occupation	Students	100%
9.	*Sharirka prakrati*	*Pitta - kaphaj*	85.71%
10.	*Jatharagni*	*Manda*	78.57%
11.	Bowel habit	Constipated	57.14%
12.	Water intake	1L – 1.5L	85.71%

RESULTS

Table 5: Showing the effect of *Jalaukavacharana* on Subjective parameters

(Wilcoxon match paired single ranked test)

Symptoms	Mean BT	Mean AT	Mean diff	% of change	SD	SE	W	P	Significance
Vedana	1.64	0.71	0.93	55.96%	0.70	0.18	66	<0.001	Highly significant
Srava	0.75	0.15	0.60	81.82%	1.05	0.27	10	>0.05	Not significant
Kandu	1.78	0.38	1.40	77.77%	0.98	0.25	78	<0.001	Highly significant
Daha	1.95	0.62	1.33	68.91%	0.72	0.18	91	<0.001	Highly significant

Analysis of Subjective parameters as per table 5

Statistically highly significant results (p<0.001) were found in *Vedana* (pain), *Kandu* (itching), *Daha* (burning sensation). Statistically non significant results (p>0.05) was found in *Srava* (discharge).

Table 6: Showing the Effect of *Jalaukavacharana* on Objective Parameters

(Wilcoxon match paired single ranked test)

Symptoms	Mean BT	Mean AT	Mean diff.	% of change	SD	SE	W	P	Significance
No. of *Pidika*	2.42	0.69	1.73	72.20%	0.79	0.20	105	<0.001	Highly significant
Size of *Pidika*	1.80	0.40	1.40	77.77%	0.98	0.25	78	<0.001	Highly significant
Pidika Ghanata	1.44	0.24	1.20	81.79%	0.56	0.14	105	<0.001	Highly significant
Shotha	1.28	0.22	1.06	84.21%	0.59	0.159	91	<0.001	Highly significant
Vaivarnyata	1.84	0.31	1.53	82.11%	0.63	0.16	105	<0.001	Highly significant
Vranavastu	0.82	0.09	0.73	91.66%	1.03	0.26	21	<0.05	Significant

Analysis of Objective parameters as per table 6

Statistically highly significant results (p<0.001) were found in no. of *Pidika*, size of *Pidika*, *Pidika Ghanata* (hardness), *Shotha* (inflammation), *Vaivarnyata* (discoloration). Statistically significant result (p<0.05) was found in *Vranavastu* (scar).

DISCUSSION

The present study revealed that incidence of the disease is more common in the age group of 15-20 years as disease Acne vulgaris primarily affects adolescent age group commonly because hormones and *Shukra Dhatu* are more active during this period. Hormonal imbalance specially of androgen stimulates the sebaceous glands to produce excess sebum. Females are more affected than males. The higher percentage of cases recorded belong to Hindu religion and 85.71% i.e., 12 of them are unmarried as selected patients are in the age group of 15-30 years. Socio-economic status indicates that people of lower and middle socio–economic status were more susceptible to Acne vulgaris. The reason behind this is that high socio-economic class people are more educated, more conscious about their health, undergo regular health checkups and avail more medical facilities rather than the middle and lower class who neglect small ailments, donot maintain proper hygiene and seek medical advice at a very late stage. Mixed diet has also shown its role in causation of disease and most of them are in habit of consuming oily, spicy, fried, junk food and less fibrous diet which are consistently increasing acidic burden of the body. The disease was encountered more among the rural population than the urban population as the rural people are less educated and are unaware. Moreover the disease was encountered more among the students as name suggests *Yuvanapidika* is a disease of adolescents. The data suggests that although the disease occurs in all 3 types of *Dvandaja Prakriti* still it is more prevalent in *Prakriti* with *Pitta* and *Kapha* predominance. Maximum numbers of patients were having *Manda Jatharagni*. According to *Acharya Vagbhata – "Roga sarve api mandagni"* means all diseases occur due to *Mandagni*. Out of 14 patients, 57.14% i.e., 8 patients were having constipated bowel habits. This shows association of acne with irregular bowel habits or constipation. According to the data, 85.71% of the patients were having water intake of about 1-1.5 litres per day. Without adequate hydration, these toxins, body wastes and even bacteria remain trapped within skin layers which increase the likelihood of acne. On analysing subjective parameters, results observed in *Vedana, Kandu, Daha* were highly significant (p<0.001) while results observed in *Srava* were not significant. On analysing objective parameters, results observed in no. of *Pidika*, size of *Pidika, Pidika Ghanata, Shotha, Vaivarnyata* were highly significant (p<0.001) whereas result observed in *Vranavastu* (p<0.05) was significant.

Probable Mode of Action of *Jalaukavacharana*

Jalaukavacharana is the preferred method of bloodletting in *Bala* (children), *Nari* (female), *Durbala* (weak), *Bhiru* (fearful) and *Sukumara* (tender nature) as mentioned in Ayurvedic classics.[16] As majority of the patients were going to be female which comes in *Bhiru/Nari* category, also the major age group in which the disease occurs belong to Sukumara category, *Jalaukavacharana* was selected for the study. As in *Mukhadushika*, vitiated *Dosha/Dhatu/Mala* get accumulated in *Srotas (Lomakupa),* causing blockage and leads to *Pidika* formation. *Jalaukavacharana* being a bio-purificatory method removes deeply seated toxins by letting out blood, clearing *Srotasa* and pacifying vitiated *Doshas*.

Leech application not only removes blood from the site but also injects biologically active substances which help to manage various ailments. Leech's saliva contains a complex mixture of different biologically and pharmacologically active substances which gets secreted into the wound. Some of them are Hirudin (anticoagulant), Bdellin (anti-inflammatory), Apyrase (platelet anti-aggregate factor), Hyaluranidase (factor for diffusion and antibiotic), Calin, Prostaglandin, Proteinase inhibitor, a vasodilator substance, an anaesthetizing substance etc. These are said to be responsible for various biological effects seen on the body after leech application. Like Hirudin and Calin which act as anticoagulants, also prevent inflammation and slow cleansing of wound. Histamine by its vasodilation 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 renders thrombolytic, anti-inflammatory and immune stimulant action.[17] Secondary bleeding for few hours, due to Hirudin, causes removal of toxins[18] 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. The diuretic and antibiotic action of Hirudin, the cleansing effect produced by secondary haemorrhage by Calin, anti-inflammatory and antibiotic effect of Piavit, Eglins, Bdellins etc. add to the efficacy of leech application in Acne vulgaris. During leech therapy, leeches are placed 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[19] which may be the reason behind pain relief. It can also be assumed as the leech sucks stagnant blood, *Shodhana* of the morbid *Dosha* via sucked blood occurs, which inturn results in the *Srotoshuddhi* 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.

Jalaukavacharana is indicated by *Acharyas* in *Raktadushti* with *Pitta* involvement. In *Mukhadushika* also, there is primarily *Rakta-dushti* due to *Pitta* and *Kapha. Sushruta* declared that *Raktamokshana* not only purifies the channels of the area of application, but also let the other parts of the body become free from disease and action is faster than other remedies. *Jalauka* sucks only the impure blood with ideal example of *Shwana* by *Vagbhata*[20] so this is considered as blood purification therapy.

CONCLUSION

The term *Yuvanapidika* indicates the prevalence of the disease in the *Yuvana* (young age). Although the disease also occurs in other area of the body like back, neck and chest but it primarily affects the *Mukha-pradesha*, therefore it is called as *Mukhadushika.* The cardinal feature of the disease *Shalmali kantakavat pidika, Toda and Ghanapidika* were observed in all the patients. *Mukhadushika* has clear-cut resemblance with modern disease Acne vulgaris which is called to be a physically and psychologically scarring disease. Although *Vata*, *Kapha* and *Rakta* are mentioned as *Dosha-Dushya* involved in the pathogenesis of the disease, *Pittaj* symptoms are also found in the disease like *Daha* and *Paka*. *Vataja* symptoms were found to be very less or in specific patients only. Most common *Vataja* symptom found in patients was *Vedana*. *Jalaukavacharana* alone is highly significant in relieving the associated complaints like *Kandu, Daha, Vedana, Vaivarnyata* and *Shotha* due to elimination of vitiated *Rakta* indirectly correcting *Pitta dosha*, due to *Srotoshodhana* effect, due to improving local blood circulation, due to various bioactive substances like anti-inflammatory substances released by *Jalauka. Jalauka* give best effect in *Mukhadushika* by expelling the morbid and vitiated *Dosha and Dhatu*. The results were encouraging, hence it can be concluded that the patients of *Mukhadushika* can be managed effectively by *Jalaukavacharana. Jalaukavacharana* is proved to be an effective, time saving affordable and acceptable treatment in Acne vulgaris.

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