

A STUDY ON THE EFFICACY OF NISHADI YOGA AVACHOORNANA IN THE MANAGEMENT OF DUSTA VRANA W.R.S.TO DIABETIC ULCER

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ABSTRACT

Diabetes is considered as 'Ice-burg' of diseases as only 1/3rd of its manifestations can be made out clinically, following are the theories put forth to explain diabetes mellitus-Genetic factor, Life style disorder, Autoimmune cause. Slight injury to glucose laden tissue will cause infection which is precipitated by an ulcer and it tends to a state of non-healing. Main stay of treatment includes antibiotics, debridement and local wound care. In spite of these treatments there is less reduction in the statistics of diabetic foot complications and amputations. In *Sushruta Samhitha* we get the most scientific approach for the management of *Vrana*, where *Sushruta* has mentioned 60 *Upakrama's* (modalities of treatment) of which *Avachoorana* (dusting) is one modality with specific indication for *medodusta*, *agambeera* and *durgandhayukta vrana*, which are seen in specific to *madhumehaja vrana* (diabetic non healing ulcers). Hence, *Avachoorana* remains more ideal procedure.

This procedure has given excellent results in the present study.

Keywords: *Agambeera, Avachoorana, Medodusta, Upakrama, Durgandhayukta Vrana*

INTRODUCTION

In an article published in (Diabetes Care, 1998) thought to be the clinical bible for diabetes, it has been predicted that India would house the largest number of patients with diabetes approaching around 20 million.^[1] The prediction is not been false but, proven to be under estimate. According to findings of ICMR sponsored INDIAB study, published in Diabetologia 2011. India is faced with galloping diabetes epidemic which is progressing at a greater speed. There are now an estimated 62 million patients with diabetes and this number is projected to explore beyond 85 million by the year 2030.^[2]

In various studies it has been observed that a substantial proportion amongst the diabetic patient will have diabetic related complications like diabetic retinopathy, diabetic neuropathy, and diabetic microvasculopathies. In due course of time, it leads to diabetic ulcer, diabetic foot, gangrene etc. Most common complication among all these are diabetic ulcer.^[3]

Even though healing of *Vrana* is a natural process of the body, the *Vrana* should be protected from *Dosha Dushti* and from various *krimis*, which may afflict the *Vrana* and delay the normal healing process. So,

for the early and uncomplicated healing of *Vrana*, treatment is necessary. The chances of this kind of secondary infections are more in diabetics as the immunity of the patients is compromised. In *madhumeha* patients, foot ulcers are more common they occur as a result of variety of factors, such as mechanical changes in conformation of the bony architecture of the foot, peripheral neuropathy and atherosclerotic arterial disease, all of which occurs with higher frequency and intensity in the diabetic population, which is rightly pointed out by *Sushruta* as in *Madhumehi* the vessels of lower limb became weakened and is unable to expel the *Doshas* (*Meda* and *Raktha* along with other *Dushyas*) leading to *Prameha Pidakas* more in lower extremities which eventually burst open precipitating an ulcer.^[4]

With respect to the above mentioned facts Ayurvedic line of treatment (*shodhana* and *ropana*) will play an important role, *Sushruta* has mentioned 60 *upakramas* for *vrana* management in *dwivraneeya*, of which *Avachoorana upakrama* found effective during pilot study carried out at Government Ayurveda Medical College and Hospital, Bengaluru, for *madhumehaja dusta vrana* patients. Hence *Nishadi yoga Avachoorana* was selected for the trial in this research work and *Nishadwaya* as established drug in the management of *madhumehaja vrana* which is cost effective, easily available and has given substantial results.

AIM AND OBJECTIVES OF THE STUDY

- To evaluate the efficacy of *Nishadi yoga Avachoorana* in the management of Diabetic foot Ulcer.
- To evaluate the efficacy of *Nisha dwaya Avachoorana* in the management of Diabetic foot Ulcer
- To compare the results of both the groups to ascertain the efficacy of *Nishadi yoga avachoorana* with *Nisha dwaya avachoorana* in the management of Diabetic foot Ulcer.

MATERIALS AND METHODS

METHODOLOGY

SOURCE OF DATA:

Patients of Diabetic foot ulcer were selected irrespective of their age, gender, caste, creed, from Out Patient and In Patient Department of Shalyatantra, Government Ayurveda medical college and Hospital Bangalore.

METHOD OF COLLECTION OF DATA:

40 Patients presenting with features of Diabetic Foot Ulcer viz. ulcer on the foot/leg with pain, numbness, discharge, foul smell and fulfilling the study criteria were randomly assigned into two groups with 20 Patients in each group.

INCLUSION CRITERIA:

1. As per Wagner classification, Ulcers of Diabetic foot with Grade 1-superficial ulcers involving full skin thickness,
2. Size of ulcer within 4*4 cms
3. Patients with features of ulcer on the foot with pain, numbness, discharge and foul smell.
4. Patients on medications (OAH/INSULIN) with controlled diabetes mellitus FBS <130mg/dl, PPBS <150mg/dl RBS <150mg/dl.

EXCLUSION CRITERIA:

1. As per Wagner classification diabetic foot Ulcer of Grade 2 and above
2. Patients with systemic disorders like Tuberculosis, Leprosy.
3. Malignancies

Note: The conditions mentioned in exclusion criteria were ruled out after the careful clinical evaluation and considering required investigations.

Method of Drug preparation

GROUP A - *Nishadi yoga*^[5]

Shuddha guggulu (100gms) is taken and the fine powder of *haridra*, *shwetha sarshapa* are added in equal quantity, *saindava lavana* $\frac{1}{8}$ th (25gms) are mixed properly and with help of *honey* (Quantity sufficient) it is rolled in *varthi* form and kept for drying under shade, dried *varthis* are pounded and fine

powder (*shlakshna choorna*) is used for the *Avachoorana* procedure.

GROUP B – Nisha dwaya^[6] : fine powder of *haridra* and *Daruharidra* is used for *Avachoorana* procedure

STUDY DESIGN:

GROUPS	Mode of treatment	Duration
GROUP A	<i>Nishadi yoga avachoorana</i>	28 days
GROUP B	<i>Nishadwaya avachoorana</i>	28 days

METHODOLOGY OF STUDY

Group A – Ulcers of patients of this group were first cleaned with Normal saline and then, fine powder of *Nishadi yoga was dusted (Avachoorana)* uniformly all over the ulcer area and over it a sterile pad was placed & bandaging done once a day for 28 days.

Group B- Ulcers of patients of this group were first cleaned with Normal saline and then was dusted *Nishadwaya (haridra, daruharidra Avachoorana)* uniformly all over the ulcer area and over it a sterile pad was placed & bandaging done once a day for 28 days.

NOTE:

However the patients of *Madhumeha* were asked to continue the treatment for the systemic condition i.e.

SAMPLING PROCEDURE

40 patients who fulfill the inclusive criteria were randomly assigned into 2 groups, Group A and Group B each consisting of 20 patients after obtaining their consent.

for *Madhumeha*. No internal medicine was advised other than their regular HYPOGLYCEMIC DRUGS.

Duration of Treatment:

Duration of treatment was 28days.

Subjective and Objective parameters assessed on 0th day, 7th day, 14th day, 21th and 28th day.

Follow-up of Study:

Follow-up of patients will be done in interval of 15 days for the period of 2 Months.

ASSESSMENT CRITERIA and GRADATION OF PARAMETERS

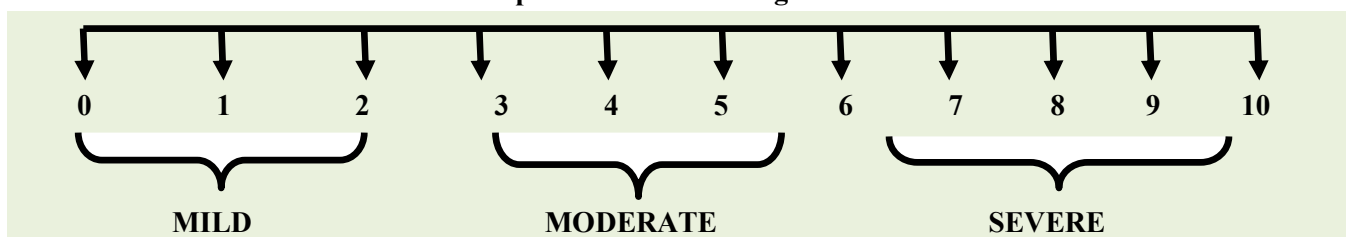
Pain – 0(No pain)

1(Mild pain)

2(Moderate pain)

3(severe Pain)

As per the Visual Analogue Scale



Numbness (loss of sensation)

2-Total loss of sensation no anesthesia is needed for surgical procedure.

1-There is diminished sensation surgical intervention can be performed with local /topical anesthesia

0-Normal sensations, complete anaesthesia of surgical site is required.

Akruthi (Size of Ulcer)

0 -No discontinuity of skin or mucous membrane.

1- 75% of previous area of the ulcer got healed

2 - 50% of previous area of the ulcer got healed

3- < 25% of previous area of the ulcer got healed / initial size

Sraava (Discharge)

- 0- No discharge
- 1- Mild (if vrana wets 3X3cms pad)
- 2- Moderate (if vrana wets 4X4cms pad)
- 3- Severe (if vrana wets 5X5cms pad)

Gandha (Smell)

- 0 - No smell
- 1 -Bad smell
- 2 - Tolerable, unpleasant smell
- 3 -Foul and intolerable smell

Overall Assessment of the Effect of the Therapy:

The overall effect of the therapy was assessed in

terms of Marked Improvement, Moderate Improvement, Mild Improvement and No Improvement.

Marked Improvement: 71-100% relief in all the signs and symptoms provided by the Therapy.

Moderate Improvement: 31--70% relief in all the signs and symptoms provided by the Therapy.

Mild Improvement: 1- 30% relief in all the signs and symptoms provided by the Therapy.

No Improvement: No relief in all the signs and symptoms provided by the Therapy.

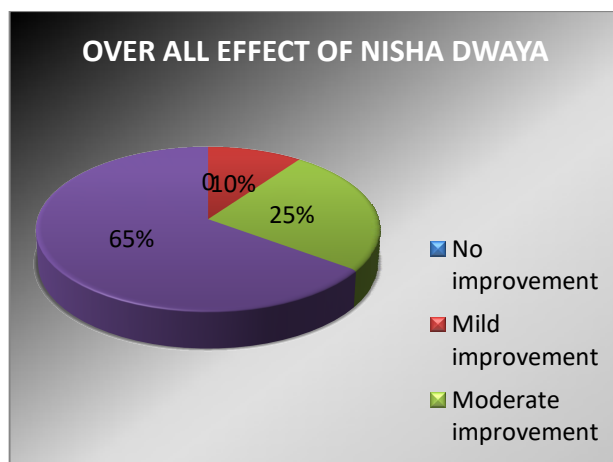
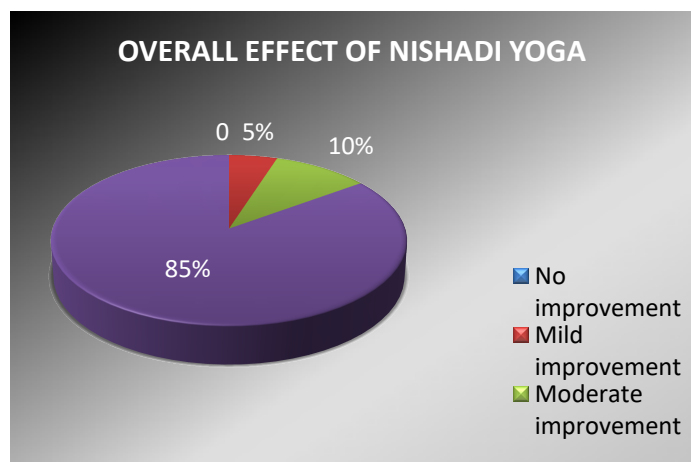
OBSERVATION AND RESULTS

Overall effect of *Nishadi yoga Avachoorana* (Group A)

EFFECT OF TREATMENT IN GROUP A			
PERCENTAGE OF IMPROVEMENT	GRADING	NO OF PATIENTS	Percentage
0	No improvement	0	0
1-30%	Mild improvement	1	5%
31-70%	Moderate improvement	2	10%
71-100%	Marked improvement	17	85%

Overall effect of *Nisha dwaya Avachoorana* (Group B)

EFFECT OF TREATMENT IN GROUP B			
PERCENTAGE OF IMPROVEMENT	GRADING	NO OF PATIENTS	Percentage
0	No improvement	0	0%
1-30%	Mild improvement	2	10%
31-70%	Moderate improvement	5	25%
71-100%	Marked improvement	13	65%



COMPARITIVE RESULTS OF Group A and Group B

ASSESSMENT CRITERIAS	GROUP A			GROUP B		
	MEAN SCORE		PERCENTAGE OF RELIEF	MEAN SCORE		PERCENTAGE OF RELIEF
	BT	AT		BT	AT	
VEDANA /PAIN	1.85	0.30	83.78%	1.95	0.35	82.05%
NUMBNESS	0.60	0.20	66.66%	0.65	0.25	61.53%
AKRUTHI / SIZE OF ULCER	3	0.50	83.33%	2.95	0.60	79.66%
SRAVA /DISCHARGE	2.15	0.15	93.02%	2	0.20	90%
GANDHA/SMELL	1.85	0.05	97.29%	1.70	0.15	91.17%

Results of Group A

The percentage of improvement in group A on Pain is 83.78%, Numbness is 66.66%, *Akruthi* is 83.33% *Srava* is 93.02% and *Gandha* is 97.29 %.

Results of Group B

The percentage of improvement in group B on Pain is 82.05%, Numbness is 61.53%, *Akruthi* is 79.66%, *Srava* is 90% and *Gandha* is 91.17%.

Comparative results of Group A and Group B

Group A	Group B	Mean Difference	SE (±)	T value	P value
85.91	82.98	2.93	3	1.298	>0.05

Comparative analysis of overall effect of the treatments in between the groups was done statistically (unpaired t test), which revealed that treatment in group B is not significant statistically when compared to that of group A. Overall result of group A is 85.91% and group B is 82.98%. Hence *Nishadi yoga* is better than *Nisha Dwaya*.

DISCUSSION

40 Patients presenting with features of Diabetic Foot Ulcer viz. ulcer on the foot/leg with pain, numbness, discharge, foul smell and fulfilling the study criteria were randomly assigned into two Groups with 20 Patients in each Group, from the OPD and IPD of Govt. Ayurvedic Medical College, Bengaluru.

NISHADI YOGA –

This yoga is selected for the trial as *Sushruta* has explained *Avachornana* for *medojusta*, *agambheera* and *durgandhayuktha vrana* where *shlakshna choorna* of *shodhana varthi* is explained for the purpose of *Avachornana* [7]. Hence, *shodhana varthi* (*nishadi yoga*) explained in *BASAVARAJEYAM* which contains *NISHA*, *SAINDHAVA*, *SIDDHARTHA* (*SHWETHA SARSHAPA*), *GUGGULU* and

MADHU which are having *vrana shodhana*, *ropana*, *sandhaana*, *vedanasthapana* properties are selected for the study.

PROBABLE MODE OF ACTION OF NISHADI YOGA

Nishadi yoga drugs having the properties like *lekhana*, *chedana*, *rookshana*, *krimigna*, *vishagna*, *sookshma*, *sara*, *shotha hara*, *sweda janana*, *vishada*, *ama paachana*, *sandhaana*, *snigda*, *varnya*, *veedana sthapana* and *ushna veerya* which are in need to treat a *madhumehaja vrana* –

- *lekhana*, *chedana*, *vishada* (*kshalana*) *guna* present in *saindava lavana* and *madhu* [8] helps in auto debridement of slough and unhealthy granulation tissues.
- *Sara* and *Sookshma guna* of *guggulu* [9] and *madhu* helps in penetration of medicaments and increases the bio availability.
- *Vedanasthapana* property of *guggulu* reduces the pain.
- *Aama pachana guna* of *haridra* [10] and *sarshapa* [11] helps in metabolisation of unprocessed metabolites and thus improves blood circulation to

the site which in-turn helps in proliferation of healthy granulation tissues.

- *krimighna* and *vishaghna* properties of *haridra*, *sarshapa* and *guggulu* prevents bacterial infection.
- *Rookshana guna* of *haridra* and *ushna veerya* of other drugs helps in reducing the *srava* (discharge).
- *Shotha hara* property of *saindhava* and *madhu* reduces the inflammatory oedema.
- *Snigdha guna* of *sarshapa* and *sandhana guna* of *madhu* helps to maintain the integrity and tensile strength of *vrana*.
- *Varnya guna* of *haridra* helps in pigmentation.

On the basis of different Research analysis done over the ingredients separately, *Nishadiyoga* drugs have been proved to have Antiseptic, Antibacterial, Anti-inflammatory, prostaglandin inhibitor, Antihistaminic and Antimicrobial Properties.¹²⁻¹⁶

Recent study on curcumin - "Curcumin suppressed the secretion of inflammatory mediators through an increase in the expression of HO-1. Curcumin induced HO-1 transcription and translation through the Nrf2/antioxidant response element signalling pathway. Inhibitory experiments revealed that HO-1 was required for the anti-inflammatory effects of curcumin. Further mechanistic studies demonstrated that curcumin inhibited neuroinflammation by suppressing NF-κB and MAPK signalling pathways in Pam3CSK4-activated microglial cells.

The results of the study suggest that curcumin may be a novel treatment for neuro - inflammation-mediated neurodegenerative disorders."^[17]

Aspartic acid and lysine present in *guggulu* is a alpha-amino acid that is used in the biosynthesis of protein by reacting with enzymes and amino acids of body.

NISHA DWAYA – This is taken as standard group, which consists of *Haridra* and *Daruharidra*. This yoga is advised for *Dusta vrana* which is the ingredient of *Kaseesadi yoga* explained in *sushrutha samhitha*.

Haridra is specially quoted as *mehaapaha* and *vranaapaha* in *Bhavaprakasha Niganthu*. *Daruharidra* is quoted as *meha vrana jit* in *Dhanvantari Nigantu*. In *Astanga Sangraha*, *Haridra* is said to be *Agrya* for *Prameha roga*.

Due to the alkaloid Curcumin in *haridra*, platelet aggregation and vascular prostacyclin synthesis, healing capacity of ulcer will be increased as it is a good vasodilator.

PROBABLE MODE OF ACTION OF ACTION OF NISHA DWAYA

Nisha Dwaya Churna by its *Lekhana*, *Kapha Vata Shamana*, *Kledashoshaka*, *Sthambhana*, *Jantughna*, *Varnya* property checks the *Vrana Varna*, *Vedana*, *Gandha*, *Srava*, and removes the slough in the *Vrana*.

- Due to the *lekhana guna* it debrides the slough and unhealthy granulation tissue,
- The *shoolahara guna* pacify the pain.
- Due to *kapha-vata shamaka*. *Rukshana* and *kledashoshana guna* it clears the secretions and local infection.
- The *jantughna* property takes care of infection. Bereberine in *Daruharidra* acts on acute, sub-acute and chronic models of inflammation thus has an anti-inflammatory property.

CONCLUSION

- *Vrana* of *madhumehi* can be compared to Diabetic ulcer on the following grounds mentioned in classics, *Prameha* is a disease which includes *dosha dooshya* and *madhu meha* is a variety of *vataja prameha* and also other types of *prameha* not treated it will turn to *madhumeha*. *Vrana* occurs in a *mehi* after the manifestation of *pidaka (vrana shopha)* which later turns into *vrana – madumehaja vrana*.
- Diabetic ulcer is very notorious to heal when compared to other ulcers, as immunity of diabetic patients is comparatively less than the non-diabetics and State of hyperglycemia precipitates the risk of secondary infection.

- Hence it is a multidisciplinary approach, where systemic glycemic control and local *shodana, ropana* makes the complete treatment.

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CASE 1



B.T



A.T

CASE -2



B.T

DURING TREATMENT

A.T

CASE -3



B.T

D.T

A.T

CASE 4



B.T

DURING TREATMENT

A.T

Source of Support: Nil

Conflict Of Interest: None Declared

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