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

Chiranth Kumar R.¹, Syeda Ather Fathima²

¹Final Year PG Scholar, ²Professor and HOD
Dept. of PG Studies in Shalya Tantra GAMC Bangalore, Karnataka, India

Email: Chiranth2010@Gmail.Com

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 Avachoornana (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, Avachoornana remains more ideal procedure. This procedure has given excellent results in the present study.

Keywords: Agambeera, Avachoornana, 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. 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. 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.

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, Sushrutha has mentioned 60 upakramas for vrana management in dwivraneeya, of which Avachoornana upakrama found effective during pilot study carried out at Government Ayurveda Medical College and Hospital, Bangalore, for madhumehaja dusta vrana patients. Hence Nishadi yoga Avachoornana 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 Avachoornana in the management of Diabetic foot Ulcer.
- To evaluate the efficacy of Nisha dwaya Avachoornana in the management of Diabetic foot Ulcer.
- To compare the results of both the groups to ascertain the efficacy of Nishadi yoga avachoornana with Nisha dwaya avachoornana 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 1/8th (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
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.

STUDY DESIGN:

<table>
<thead>
<tr>
<th>GROUPS</th>
<th>Mode of treatment</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>GROUP A</td>
<td>Nishadi yoga avachoornana</td>
<td>28 days</td>
</tr>
<tr>
<td>GROUP B</td>
<td>Nishadwaya avachoornana</td>
<td>28 days</td>
</tr>
</tbody>
</table>

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 (Avachoornana) 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 Avachoornana) 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. for Madhumeha. No internal medicine was advised other than their regular HYPOGLYCEMIC DRUGS.

Duration of Treatment:
Duration of treatment was 28 days.

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.

ASSESMENT 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 3X3 cms pad)
- 2 - Moderate (if vrana wets 4X4 cms pad)
- 3 - Severe (if vrana wets 5X5 cms 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.

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**OBSERVATION AND RESULTS**

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

<table>
<thead>
<tr>
<th>EFFECT OF TREATMENT IN GROUP A</th>
<th>PERCENTAGE OF IMPROVEMENT</th>
<th>GRADING</th>
<th>NO OF PATIENTS</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>No improvement</td>
<td>0</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>1-30%</td>
<td>Mild improvement</td>
<td>1</td>
<td>5%</td>
<td></td>
</tr>
<tr>
<td>31-70%</td>
<td>Moderate improvement</td>
<td>2</td>
<td>10%</td>
<td></td>
</tr>
<tr>
<td>71-100%</td>
<td>Marked improvement</td>
<td>17</td>
<td>85%</td>
<td></td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>EFFECT OF TREATMENT IN GROUP B</th>
<th>PERCENTAGE OF IMPROVEMENT</th>
<th>GRADING</th>
<th>NO OF PATIENTS</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>No improvement</td>
<td>0</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>1-30%</td>
<td>Mild improvement</td>
<td>2</td>
<td>10%</td>
<td></td>
</tr>
<tr>
<td>31-70%</td>
<td>Moderate improvement</td>
<td>5</td>
<td>25%</td>
<td></td>
</tr>
<tr>
<td>71-100%</td>
<td>Marked improvement</td>
<td>13</td>
<td>65%</td>
<td></td>
</tr>
</tbody>
</table>
### COMPARITIVE RESULTS OF Group A and Group B

<table>
<thead>
<tr>
<th>ASSESSMENT CRITERIAS</th>
<th>GROUP A</th>
<th>GROUP B</th>
<th>PERCENTAGE OF RELIEF</th>
<th>PERCENTAGE OF RELIEF</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>MEAN SCORE BT</td>
<td>AT</td>
<td></td>
<td>MEAN SCORE BT</td>
</tr>
<tr>
<td>VEDANA /PAIN</td>
<td>1.85</td>
<td>0.30</td>
<td>83.78%</td>
<td>1.95</td>
</tr>
<tr>
<td>NUMBNESS</td>
<td>0.60</td>
<td>0.20</td>
<td>66.66%</td>
<td>0.65</td>
</tr>
<tr>
<td>AKRUTHI / SIZE OF ULCER</td>
<td>3</td>
<td>0.50</td>
<td>83.33%</td>
<td>2.95</td>
</tr>
<tr>
<td>SRAVA /DISCHARGE</td>
<td>2.15</td>
<td>0.15</td>
<td>93.02%</td>
<td>2</td>
</tr>
<tr>
<td>GANDHA /SMELL</td>
<td>1.85</td>
<td>0.05</td>
<td>97.29%</td>
<td>1.70</td>
</tr>
</tbody>
</table>

Results of Group A
The percentage of improvement in group A on Pain is 83.78%, Numbness is 66.66%, Akruhti 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%, Akruhti is 79.66%, Srava is 90% and Gandha is 91.17%.

Comparative analysis of overall effect of the treatments in between the groups was done statistically (unpaired t test), which reviled 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 Avachoornana for medojusta, agamb-heera and durgandhayuktha vrana where shlokshna choorna of shodhana varthi is explained for the purpose of Avachoorana [7]. Hence, shodhana varthi (nishadi yoga) explained in BASAVARAJEYYAM which contains NISHA, SAINDHAVA, SIDDHAR-THA (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,ooksksha, 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 Antisepic, 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 an 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 *vranaaapaha* in *Bhavaprakasha Niganthu*. Daruharidra is quoted as *meha vrana jii* in *Dhanvantari Niganthu*. 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, Kaptha 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 *kaptha-vata shamaka*. *Rukshana* and *kle-dashoshana 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.

**REFERENCES**

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17. (Meiling Jin, Sun Young Park, Qian Shen (et al.) “Anti-neuroinflammatory effect of curcumin on pam3CSK4-stimulated microglial cells” 2017Oct 27,521-530.

**CASE 1**

![AMPUTED GREAT TOE ULCER](image)

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

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