

Available online at <http://www.ijims.com>

ISSN: 2348 – 0343

Management of Diabetic foot ulcer (*Madhumehajanyadustavrana*) in Ayurveda

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Abstract:-

In present scenariosedentary life style, a lot of stress and over nutrition are important etiology of diabetes, as one of the most prevalent diseases in the world. Foot complication and amputations represent one of the most important among all the long term problems of diabetes medically, socially and economically. In mostly cases diabetic ulcers are the result of underlying neuropathy characterized by neurogenic ulcer. Diabetic person have complication on many system as on eye, renal system, cardiovascular system and Central nervous system but foot lesions are responsible for more hospitalizations than any other complication of diabetes. Diabetes is the leading cause of nontraumatic lower extremity amputations in India, with approximately 5% of diabetics developing foot ulcers each year and 1% requiring amputation. The diabetic foot ulcer can be considered as Dushtavrana in Ayurvedic classics and the need to look for the management through Ayurveda. AcharyaSusruta who is the father of surgery mentioned Jaloukavacarana as a treatment in Dushtavrana. In the management of DushtavranaSushruta emphasized upon shodhana. The procedure employed upon a wound in order to clean it, is called vranashodhana.Charaka advocates shodhana by both systemic and local methods like Vaman, Virechana, vasti and shastra karma. Some herbal drugs can also be used in management of diabetic foot ulcer (DFU)

Key words: Diabetic foot ulcer, Sushrut samhita, Shodhana, Herbal drugs.

Introduction-

Madhumeha or Diabetes mellitus is known from Vedic Times. Even in Puranas and Kavyas the description of Madhumeha and its treatment are given. Diabetes mellitus represents a group of chronic diseases characterized by high levels of glucose in the blood resulting from defects in insulin production, insulin action, or both. Worldwide, the number of cases of diabetes has been estimated to be 171 million, and by 2025, this number is projected to reach 366 million. As obesity represents an important risk factor for type 2(Non-insulin-dependent or adult-onset) diabetes. Patients with diabetes are at risk for developing serious health problems that may affect the eyes, kidneys, feet, skin, and heart.

The term 'Diabetic foot' is somewhat a misnomer, as the condition has been defined as a group of syndromes that can involve Neuropathy, Ischemia and Infection, with the neuropathic type being the most common. Diabetic ulcers tend to occur most commonly on the plantar weight bearing surfaces of the foot underneath the pressure point (1). “*Vrana*” is an entity of tissue destruction and discoloration, in which a permanent scar tissue is left behind on the body on its healing and remains till the body survives. The development of diabetic foot ulcers (DFUs) typically results from peripheral neuropathy and/or large vessel disease, but most commonly DFUs are caused by peripheral neuropathy.

Epidemiology :-

Most common cause of diabetic patient to get hospitalized is Diabetic foot ulcers. As many as 15% of people with diabetes will develop foot ulceration and its related complications (2) and 3% cases have a lower limb amputation.(3)

Diagnostic criteria-

Diagnosis and assessment of foot ulcers requires regular foot examinations that usually include assessment of protective sensation, foot structure and biomechanics, vascular status, and skin integrity. An International Working Group of the Diabetic Foot (**IWGDF**) developed a classification system for research purposes, and according to this system, diabetic foot ulcers are categorized by the extent of perfusion, size, depth/tissue loss, infection and sensation. An international guideline was developed and issued on behalf of the Infectious Diseases Society of America to aid the diagnosis and treatment of diabetic foot infections.

Foot and Ulcer Evaluation-

The foot and ulcer examination should include the following: (4) assessment of dermatologic changes in the surrounding skin, including callus, musculoskeletal deformity and muscle wasting; (5) documentation of ulcer characteristics, including location, shape, and size of the wound (measurement of length, width, and depth);(6) determination of the condition of the wound edges, wound bed, wound base, periwound skin, and exudates; and (7) determination of the presence of necrosis and wound-associated pain.[8-9].

Table-1 Wagner Classification System for Diabetic Foot Ulcer-

Grade	Lesion
0	No open lesions: may have deformity or cellulitis
1	Superficial ulcer
2	Deep ulcer to tendon or joint capsule
3	Deep ulcer with abscess, osteomyelitis, or joint sepsis
4	Local gangrene – forefoot or heel
5	Gangrene of entire foot

Determine the need for hospitalization-

Hospitalization is the most expensive part of treating a diabetic foot infection, and deciding on its necessity requires consideration of both medical and social issues. Patients with infections that are either severe or complicated by critical limb ischemia should generally be hospitalized .Some patients with apparently mild infections and more patients with moderate infections may also need hospitalization; this may be for observation, urgent diagnostic testing, or because complicating factors are likely to affect their wound care or adherence to antibiotic treatment. In

the absence of these complicating features, most patients with mild or moderate infections can be treated as OPD basis.

Treatment in Ayurveda-

Management of Prameha (Madhumeha)

According to Ayurveda the line of treatment of Prameha is strictly on the basis of individuals constitution.

- 1) The Prakriti of the patient
- 2) Dosha predominance of disease
- 3) Dooshya vitiation
- 4) Obstruction in srothus
- 6) Ahara&Vihara
- 7) Hereditary factors etc...

In general *Vatajaprameha* Patients are advised to have *bhrimhana* medication & diet which increases *dhathus* in the body

Specific principles of the management of dushtamadhumehajanyavrana. (Dushtavrana)

- Nidanaparivjanaan
- Shodhana- The patients should be given a thorough systemic cleaning (Shodhana) by vamana and virechan, his food should be light and should be aimed at drying up of the wound. A wound should be washed with decoction of drugs of either Rajavriksadigana or Surasadigana, oil medicated with the same drugs is good for shodhan of wound, Kshar (alkalies) or oil prepared with Kshar may be used for this purpose [10]. For shodhan of the dushtavrana apart from the kashaya, the verti, kalka, sarpi, tailam, raskriya and churnam can also be used.
- *Visravan* - Sushruta specially mentioned bloodletting by means of leeches in *dushtamadhumehajanyavrana*.
- *Ropana* - A wound should never be subjected to *ropana* treatment unless it thoroughly cleaned.

Shodhana-

In the management of dushtavrana Sushruta emphasized upon shodhana. The procedure employed upon a wound in order to clean it, is called *vranashodhana*. A contaminated wound which refuses to heal begins to have its natural sequences of healing, only after it is properly cleaned. Apart from nonhealing, the *dushtavrana* may produce other local and general symptoms. Accumulated pus if not drained destroys the *marma* (vital parts), *sira*, *snayu*, if ever there are the remote chances of a wound healing with the doshas inside then, it may give rise to cavities inside the healed wound and other diseases. Charaka advocates shodhana by both systemic and local methods like Vaman, Virechana, vasti and shastra karma.

General indication of Shodhana

All those vranas, which are characterized by foul smell, ugly look, excessive discharge and excessive pain as in dushtavrana.

Method of Vrana-shodhana

These methods vary depending upon the site, size and shape, discharge etc. of the vrana. These can be classified as follows –

- ❖ Conservative measures by kashaya, varti etc.
- ❖ Para-surgical measures like
 - Dhoopan
 - Kshara – karma
 - Krimighna, Vishaghna, Patradana
- ❖ Surgical measures
 - Chedana (Excision)
 - Bhedana (Incision)
 - Lekhana (Scrapping)
 - Eshana (Probing)
 - Aaharanam (Extraction)
 - Vyadhan (Puncturing)
 - Visravan (Drainage)

Charaka says that the physician observing swelling (inflammation) as prodromal sign in the beginning should apply blood letting to prevent the manifestation of wound. He also explains thirty six measures of treatment of wounds from which anti-swelling measures (“Shophaghna”) comes first (Bloodletting)[11]. Sushruta significantly notes that blood as the medium for spread of the disease[12]. It ultimately tells about the importance of Visravan in the management of dushtavrana. Treatment strategies for diabetic foot ulcers include metabolic control of diabetes mellitus, eradication of infection, promotion of ulcer healing, and removal of pressure from the ulcers. A previous systematic review found poor evidence to assess the effectiveness of wound dressings and other interventions to treat infections, due to small, inadequately-powered trials with a variety of methods and outcomes [13]. Herbal medicines have been used for skin wound problems, including diabetic foot ulcers, and aim to clear heat and eliminate toxins, improve circulation and dispel blood stasis, and promote healing of the wound [14]. They can be used orally or topically, alone or in combination with conventional Western medicine. Clinical studies have shown their therapeutic potential for foot ulcers .

Herbs useful in treatment of Diabetes- Vijaysar [*Pterocarpusmarsupiumleguminosae*]

Rasa (Taste) :Kashaya (Astringent), Tikta (Bitter)

Guna (Characteristics) – Lakhu (Light), Ruksha (Rough)

Veerya (Potency) – Sheeta (Cold)

Vipaka (Post digestion effect) – Katu (Pungent)

Actions according to Ayurveda :-

- Rasayana :**Vijaysar** rejuvenates each and every cell of the body.
- Raktasodhana :**Vijaysar**purifies the blood and removes all toxins from it.

- Krimirogahar (Antihelmenthic) :**Vijaysar** is very useful in disease which originate from external causes like infection, worm infestation etc.
- Pramehaghna :**Vijaysar** is useful in all disease which involve discoloration of urine including diabetes (Madhumeha).

Table-2 Strategies that may prevent or delay development of DFU-

Component cause	Prevention strategies
Peripheral neuropathy	<ul style="list-style-type: none"> ❖ Patient instruction on how lack of protective sensation requires special care and diligence by patient, family, and healthcare provider ❖ Protective footwear ❖ Good glycemic control
Deformity	<ul style="list-style-type: none"> ❖ Appropriate shoes/inserts to accommodate contours of the foot and relieve pressure
Minor trauma	<ul style="list-style-type: none"> ❖ Protective footwear ❖ Review of living environment for safety
Peripheral ischemia	<ul style="list-style-type: none"> ❖ Alter risk factors for atherosclerosis (smoking, hypertension, lipoprotein abnormalities) ❖ Revascularize for critical ischemia
Callus	<ul style="list-style-type: none"> ❖ Regular removal of callus ❖ Footwear to minimize callus development
Peripheral edema	<ul style="list-style-type: none"> ❖ Footwear to accommodate presence/absence of edema ❖ Resolution of edema based on etiology (pharmacologic approaches, compression stockings, bed rest)

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