



DISEASE REVIEW ON *MADHUMEHAJANYA DUSTA VRANA* VIS-À-VIS DIABETIC FOOT ULCER

NARAYAN K.R¹ SIDDANAGOUDA A PATIL² PRASHANTH A.S.³

ABSTRACT

Prameha is one of the *Ashtamahagada* occurring mainly due to *Santarpana nidanas* involving ten *Dushyas*, which eventually results into *Madhumeha*. On *Deergakala*, due to improper timely management, complications occur in the form of *Prameha Pidakas* which if further untreated results in *Madhumehajanya dusta vrana*. Based on *nidana* and *lakshana*, *Prameha* and *Madhumehajanya dusta vrana* can be correlated to Diabetes Mellitus (DM) and Diabetic Foot Ulcer (DFU) respectively as per the contemporary science. As per the WHO, 2% of all deaths in India are due to Diabetes, which can be attributed to the complications of Diabetes Mellitus rather than to the disease alone. Among the DM complications, understanding the Diabetic Foot Ulcer, a complication which involves Neurological, Vascular and Musculoskeletal components of the foot plays a vital role as it affects approximately 15% of diabetic patients during their lifetime. Among them, between 0.03% and 1.5% of patients with diabetic foot, require an amputation. This results in deterioration of quality of life of an individual. To overcome this scenario, in Ayurvedic classical literatures, *Nidana*, *Lakshana* and *Chikitsa* of *Madhumeha* and *Dusta vrana* through *Kaya Sodhana* followed by *Vrana Shodhana* and *Vrana Ropana Chikitsa* is detailed with the preventive and curative measures. Hence, adoption of Ayurvedic principles to manage and prevent the *Madhumehajanya dusta vrana* with special reference to Diabetic foot ulcer is a challenging task and holds a significant role in improving the life of the patient by avoiding amputation.

Keywords: *Prameha*, *Madhumeha*, *Dushta Vrana*, *Madhumehajanya Dushta Vrana*, *Diabetic Foot Ulcer*.

¹PhD scholar, Dept. of Shalya Tantra - Ayurveda Mahavidyalaya, Hubballi; Asst. Prof - Atreya Ayurvedic Medical College Hospital and Research Center, Doddaballapura

²Professor, Dept. of Shalya Tantra, Ayurveda Mahavidyalaya, Hubballi

³Principal, Dept. of Kayachikitsa, Ayurveda Mahavidyalaya, Hubballi

Corresponding Email id: danu.nani@gmail.com Access this article online: www.jahm.co.in

Published by Atreya Ayurveda Publications under the license CC-by-NC-SA

INTRODUCTION

Prameha is the *Tridoshaja*, *Santarpanottha*, *Anusangi*, *Chirakari swabhava Mahavyadhi* involving *Basti Marma* and ten *Dushyas* characterized by excessive urination and increased frequency of urination along with altered characteristics of urine. Based on the above characteristics, twenty types of *Prameha* are explained in classical literatures according to *Dosha* predominance and characteristics of *Mutra*.¹ Due to *Margaavarana*, *Vataprakopakara nidana* and *Apratikara* of the *Kapha Pradhana Prameha* in the initial stages, *Vata Pradhana Prameha* called *Madhumeha* is manifested, which is characterized by *Prabhoota Mutra*, resembling *Madhu* in *Rasa* and *Varna*.² *Prameha/Madhumeha* is a complex disease and its management is a challenging task. On *Deergakala*, if *Nidana* is continued even after the complete manifestation of *Prameha/Madhumeha* or if proper management is not adopted on time, complications occur in the form of *Prameha Pidakas*³ which if further untreated results into *Madhumehajanya dusta vrana*. Based on etiology and clinical features, *Prameha* and *Madhumehajanya dusta vrana* can be correlated to Diabetes Mellitus and Diabetic Foot Ulcer respectively in the contemporary science.

In the present modernized era, human beings possess many sophistications, luxuries and technology that has reduced day to day physical activities, leading to sedentary and unhealthy life-style resulting in increased prevalence of metabolic disorders like Diabetes Mellitus. India has estimated 77 million people with Diabetes, which makes it the second most affected country in the world, after China.⁴ As per the World Health Organization, 2% of all deaths in India are due to diabetes.⁵ Here, this mortality rate can be attributed to the complications of Diabetes Mellitus rather than to the disease alone as it affects an individual in multiple ways and only if not kept under control or treated on time leads to complications targeting organs like Heart, Kidney, Nerves, Eyes etc. Among these complications, understanding the Diabetic Foot Ulcer (DFU), a complication which involves Neurological, Vascular and Musculoskeletal components of the foot plays a vital role as it is the most common complication affecting approximately 15% of diabetic patients during their lifetime mainly due to lack of awareness regarding foot care, which patients suffering from diabetes should follow.⁶

The formation of Diabetic foot ulcer holds a significant place as it can lead to

amputation if not managed properly and affect the daily life of the individual to a greater extent. After an amputation, prognosis is poor and quality of life is further deteriorated. Hence, treating diabetic foot ulcer and avoiding amputation holds a significant role and has become a challenging task to accomplish in the management of DFU. Thus, it is the need of an hour to understand the pathology of DFU in relation to *Madhumehajanya dusta vrana* and manage by adopting Ayurvedic principles of management.

Prameha – Madhumeha

Prameha is a disease characterized by excessive urination and increased frequency of urination along with altered characteristics of urine, caused due *Asyasukha, Swapna sukha and Sevana of Dadhi Gramya Oudaka Anupa Mamsa, Navanna, Gudavikriti and Kaphakara ahara*.⁷

In the person who indulges in the above mentioned *Nidanas, Vata, Pitta* and *Kapha* gets vitiated, combine with the vitiated *Meda, Kleda* and other *Dushyas*, then travel downward towards the *Adho Kaya* to get localized in the *Basti mukha* and get excreted along with *Mutra*⁸ resulting into 20 types, based on the nature and frequency of urination. Among these *Madumeha* resulting due to *Vata pradhanata*, characterized by *Prabhoota Mutra*, which resembles *Madhu* in

Rasa and *Varna* plays a major role as all the other types end by *Madhumeha*.

Madhumeha is a complex disease and its management is a challenging task as it needs a multi-dimensional plan due to following features:

- *Anushangi* and *Cirakari svabhava* of the *Vyadhi*.
- Involvement of the *Tridosha* in the *Samprapti* of the *Vyadhi*.
- Different types of *Samprapti* involved in the manifestation of *Prameha/Madhumeha* based on the body constitution of the patient i.e *Krisa* or *Sthula*.
- Involvement of ten *Dushyas* like *Meda, Rakta, Shukra, Ambu, Vasa, Lasika, Majja, Rasa, Ojus* and *Mamsa* in the manifestation of the *Vyadhi*.⁹

Prameha Pidaka

All the *Acharya's* have explained *Prameha pidaka* under *Upadrava* of *Prameha*, which occur on the body of the *Pramehi* having predominance of *Meda* and *Vasa*, and whose *Dhatu* are vitiated by aggravated *Vata, Pitta* and *Kapha dosha*. In *Pramehi/Madhumehi*, there is *Kapha* predominance along with *Dravataha* increase in *Kapha* which will result in *Sarira shaithilyata*. This *Bahudrava Slesma* gets amalgamated with *Abaddha meda* (due to *Samana Guna*) and vitiates *Mamsa, Vasa* and

further increases the *Kledata* in the *Sarira*. This gets deposited below the *Tvak* and *Mamsa pradesa* resulting in the formation of *Pidakas*.¹⁰ Over the due course of time, this vitiated *Kapha*, *Mamsa*, *Vasa* and *Meda*, along with *Rakta* results in the formation of *Puya* which gets accumulated below the *Tvak* and *Mamsa pradesa*. If *Sopha* containing *Puya* is not treated on time, it may burst open to form a *Vrana* or it can take *Abhyantara gati* and result in the formation of a *Nadi*.

Etiopathogenesis Of Madhumeha Janya Dusta Vrana

Vrana occurring by *Vatadi dosha Prakopa* and *Abhighata* are termed as *Nija vrana* and *Agantuja vrana* respectively.¹¹ Due to improper management or various internal, external or psychological factors, these *Vrana's* eventually turn into *Dusta vrana*.

Though there is no direct reference regarding *Madhumehajanya dusta vrana*, *Vrana* occurring out of *Prameha pidakas* can be considered so. In case of a *Nija Madhumehajanya dusta vrana*, *Vatadi dosa Prakopa* takes place prior to the formation of *Vrana*, whereas in *Agantuja Madhumehajanya dusta vrana*, *Vrana* gets manifested first followed by *Vatadi dosha prakopa*.

Eventually, as *Madhumehajanya dusta vrana* is *Dirghakalanubandhi*, even *Agantuja Madhumehajanya dusta vrana* after a period of 7 days becomes *Nija Madhumehajanya dusta vrana* due to *Doshopaplava*. This *Vrana* manifestation can be considered under the *Bheda avasta* of the *Prameha -Vyadhi Kriyakala*.

Samprapti Ghataka of Madhumehajanya Dusta Vrana

Table 1: SAMPRAPTI GHATAKA of MADHUMEHAJANYA DUSTA VRANA

Dosha	<i>Tridoshaja vyadhi</i> with predominance of <i>Kapha</i>
Dushya	<ul style="list-style-type: none"> • <i>Dhatu – Tvak, Rakta, Mamsa, Meda, Vasa</i> • Along with all the <i>Dushya</i> involved in <i>Madhumeha samprapti</i>
Agni	<ul style="list-style-type: none"> • <i>Jatharagni, Dhatvagni</i> and <i>Bhutagni</i>
Agnidusti	<ul style="list-style-type: none"> • <i>Mandagni, Vishamagni</i> and <i>Tikshnagni</i> depending on the predominance of <i>Kapha, Pitta</i> and <i>Vata</i> respectively.
Ama	<ul style="list-style-type: none"> • <i>Mandagnijanya ama</i>
Srotas	<ul style="list-style-type: none"> • <i>Rasavaha srotas</i> • <i>Raktavaha srotas</i> • <i>Mamsavaha srotas</i> • <i>Medovaha srotas</i> • Along with all the <i>Srotas</i> involved in <i>Madhumeha samprapti</i>
Vyakta sthana	<ul style="list-style-type: none"> • <i>Tvak</i>

Adhistana	• <i>Tvak</i>
Rogamarga	• <i>Bahya roga marga</i>
Svabhava	• <i>Chirakari / Dirghakalanubandhi</i>
Prabhava	• <i>Yapya</i>

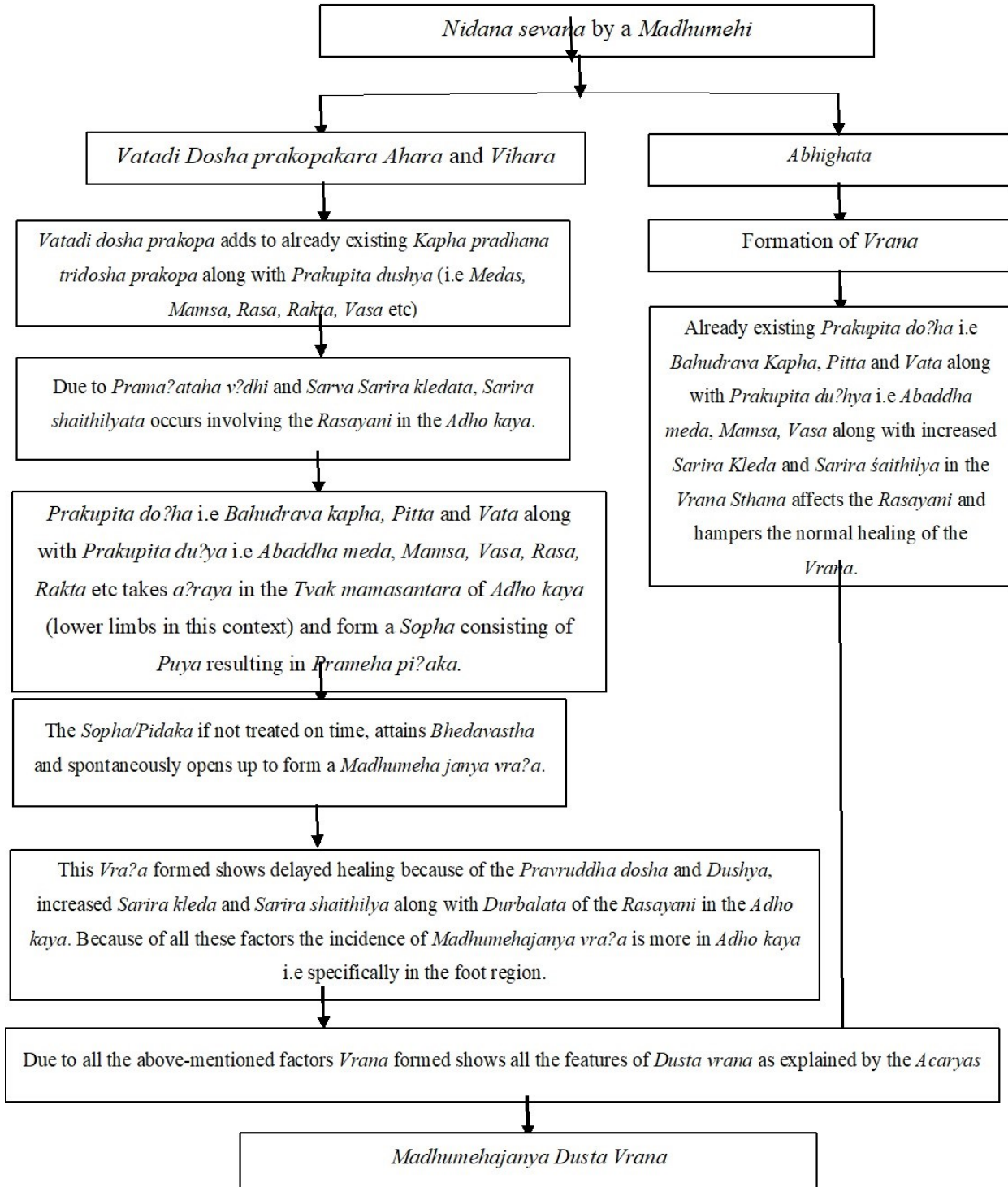


Figure 01: Etiopathogenesis of Madhumehajanya Dusta Vrana

Diagnosis of *Madumehajanya Dusta Vrana*

Diagnosis is based on the *Lakshanas* of *Vrana* presented by an individual suffering from *Prameha*. Apart from most of the *Samanya dusta vrana lakshana* following *Lakshana's* can be specifically attributed to *Madhumehajanya dusta vrana*- viz;^{12,13}

- *Krisna Rakta Pita SHukla varnanam/ Anyatama varna*
- *Putipuya mamsa sira snayu prabhriti*
- *Bhairava*
- *Putipuya srava*
- *Amanojna darshana and Amanojna gandha*
- *Piḍakopadruta*
- *Dirghakalanubandhi*
- *Avasanna Vartma*
- *Atisthula vartma*
- *Atipiḍaka vrana*
- *Atipinjara*
- *Nila, SHyava, Rakta or Krisna varna vrana*
- *Atiputika*
- *Kumbhimukha*

Chikitsa Of *Madhumehajanya Dushta Vrana*

Treatment of *Madhumehajanya Dusta vrana* follows the same line of treatment of *Dusta vrana*¹⁴ in general along with the treatment of *Madhumeha*.¹⁵

Among the 60 *Upakrama*¹⁶ mentioned by *Acharya Sushruta* specific treatment modalities are selected based on the

predominant *Dosha* involved, *Roga* and *Rogi bala*, *Avastha* of the *Vyadhi* etc and at the same time *Madhumeha chikitsa* is also to be adopted.

For example:

1. First *Ekadasha upakrama* can be adopted in the *Sophavastha (Apatarpanadi upakrama)*
2. Other *Upakramas* like *Kaya Sodhana* with *Vamana, Virecana, Basti, Raktamokshana* etc, *Sthanika Shodhana* with *Praksalana, Jaloukavacharana, Sodhana lepa* etc can be adopted during the actual *Vrana avashtha* for proper *Sodhana* and *Taila, Ghrita* etc can be indicated for *Ropana* of the *Vrana*.
3. Once the *Vrana* is healed, to bring back the normal color and texture of the *Vrana sthana*, *Krishnakarma* or *Panḍukarma* etc procedures can be adopted.

Similarly, *Madhumeha chikitsa* should also be advocated considering the following factors:

1. Based on whether *Madhumehi* is *Sthula* or *Krisa*, *Apatarpana* or *Santarpana chikitsa* should be advised.
2. Based on the predominant *Dosha* and *Dushya* involved *Chikitsa* should be selected.
3. During this, *Madhumehi* should also be advised suitable *Pathya* that can be given in both *Madhumeha* and *Madhumehaja Dusta vrana* conditions.

All these *chikitsa* put together i.e *Kaya Sodhana* followed by *Vrana Shodhana* and *Vrana Ropana Chikitsa* when administered properly results in proper healing of *Madhumehajanya dusta vrana*.

Pathya – Apathya In Madhumehajanya

Dusta Vrana

The same dietary principles and articles as mentioned in *Prameha / Madhumeha chikitsa* and *Vrana chikitsa* should be employed even in *Madhumehajanya dusta vrana chikitsa*.

- *Vranita* should consume *Jirna shali, Odana* which is made warm, unctuous & to be taken with *Jangala Mamsa*. Soup prepared from *Tanduliyaka, Jivanti, Vartaka, Patola, Karavellaka, Dadima, Amalaki* etc.
- *Puya vardhana dravya* mentioned by *Acharya Sushruta* which consists of *Navadhanya, Masa, Tila, Kalaya, Kulatha, Nispava, Haritaka, SHaka, Amla, Lavana, Katuka, Guḍa pista vikriti, Vallura, SHuska shaka, Aja Avika Anupa Odaka mamsa, Vasa, Shitodaka, Krishara, Payasa, Dadhi, Dugdha* and *Takra* should be avoided.¹⁷
- Even though *Chankramana, Vyayama, Upavasa* and other *Medohara karma* are advised in *Prameha / Madhumeha chikitsa*, it is contraindicated in a *Vrani*, as it causes *Vata prakopa* and can lead to *Vrana upadrava*.

Sadhyasadhyata Of Madhumehajanya Dusta Vrana

- The *Vrana* in a *Madhumehi* is *Kriccha sadhya* and *Vrana* in a *Madhumehi/Pramehi* if associated with *Krimi* is considered as *Yapya*. But, this *Yapyata* of *Madhumehajanya dusta vrana* becomes *Asadhyata* if suitable *chikitsa* is not administered on time when the *Vyadhi* is in *Navina Avasta*. This if further neglected, it can take away the life of an individual.
- Also, if the *Vrana* is *Dirghakalanubandhi* and if the *Rogi* is *Alpa bala yukta*, the condition can be considered as *Asadhya*.¹⁸

Diabetes Mellitus

Diabetes Mellitus is a metabolic disorder in which carbohydrate utilization is reduced and that of lipid and protein is enhanced. It is caused by an absolute or relative deficiency of insulin and is characterized by hyperglycemia. It is basically classified into two types as Type 1 DM and Type 2 DM. Individuals suffering from Type 2 DM are further classified into Obese and Non-obese type based on the pathology of insulin resistance.¹⁹

Diabetic Foot Ulcer

Diabetes affects the individual in multiple ways and if not kept under control or treated on time it can lead to various

complications, among which the formation of Diabetic foot ulcer holds a significant place as it can lead to amputation if not managed properly affecting the daily life of an individual to a greater extent.

Anatomical, Physiological And Biomechanical Aspects Of Foot

The human foot is a complex structure adapted to allow orthograde bipedal stance and locomotion. It is the only part of the body that is in regular contact with the ground and which is designed to be strong and resilient with fibrous and dense superficial fascia. It is described as an architectural marvel of the nature, as its construction is the best example of the structural adaptation to the function. It performs two major functions based on construction i.e. elastic arches form of construction acts as a pliable platform to support the body weight during standing position and the segmented arched lever form converts the foot into a spring which helps propel the body forward during walking, running, and jumping. Also it has the characteristics of a triple axial joint which allows it to assume any position, particularly during rotational movements to adapt to an uneven surface.²⁰

For the management of Diabetic foot ulcer, pathomechanics of the foot in a diabetic patient having an ulcer is to be understood, by knowing the normal biomechanics of the foot

and then analyzing the pressure areas of the foot. A biomechanical assessment involves an examination of the lower limbs, looking at their structure, alignment, pressure exerted at different points, strengths and weaknesses. The knowledge of biomechanics of the foot during walking and running plays a significant role, as in chronic diabetic patients with diabetic neuropathy, altered gait remains unnoticed till ulcer develops. Even after the development of the diabetic foot ulcer the gait of the foot changes, as the patient tries to accommodate his foot posture as per the site where the ulcer is formed, which in turn adds up to the formation of another ulcer in the foot.

Pathology Of DFU²¹

Genetic Predisposition, Uncontrolled Plasma glucose level, Age, association of co-morbidities, Smoking & Alcohol consumption, Dyslipidaemia, Diabetic Peripheral Neuropathy and PVD leads to Diabetic Foot involving pathology of Neuropathy and Neuroischemia, which eventually results in Diabetic Foot Ulcer. Abnormal foot shape, Nerve damage (neuropathy), Impairment of blood supply and Infections are some of the factors associated with the development of diabetic foot ulceration.

So, from the above factors we can conclude that Diabetic foot ulceration occurs through either of the two pathways.

- Fissures + Infection + Abscess = Ulcer
- Pressure/Trauma + Dermal Callus + Dermal Hematoma = Ulcer.

Among 15% of DFU patients, between 0.03% and 1.5% of patients with diabetic foot, require an amputation. It has been estimated that, globally, a lower limb (or part of a lower limb), is lost to amputation every 30 seconds as a consequence of diabetes.²² This is because of multiple pathologies like micro angiopathy of the foot, neuropathy (Chronic hyperglycaemia and polyneuropathy causes damage to sensory, motor and autonomic nerve fibres leading to functional and structural changes in the foot), association with atherosclerosis and also due to various other factors like improper diabetic medication, improper diet, barefoot walking, low socio-economic conditions, minor un-noticed trauma and also lack of awareness regarding foot care which patients suffering from diabetes should follow. These factors leads to miserable life with ulcers of non-healing nature, foul smell, pain, repeated superimposed infections progressing to gangrenous changes in the affected foot, finally resulting in amputation of the affected leg. Limb amputation has a major impact on the individual, not only in disfiguration of body, but also with regard to loss of productivity, increasing dependency, and costs of treating foot ulcers if patients

require inpatient care.²³ After an amputation, prognosis is poor and quality of life is further deteriorated. Hence, treating diabetic foot ulcer and avoiding amputation holds a significant role and has become a challenging task to accomplish in the management of diabetic foot ulcer.

Clinical Features Of Diabetic Foot Ulcer

❖ Site

Most common sites of ulcerations are in the forefoot. Ulcers occur at sites of high pressure on either plantar or dorsal surfaces and are caused by bony prominences, ill-fitting footwear and toe deformities.

❖ Symptoms

- A painless ulcer over the foot, which began as sequel of a cut, blister, sore, callus etc.
- Association of Bleeding and Discharge from the ulcer
- Foul smell from the ulcer
- Swelling, Redness, Discolouration and Numbness around the ulcer area.
- Symptoms of Peripheral Neuropathy can also be appreciated, as most of the cases of DFU are associated with DSPN.
- Features based on the Wagner DFU Grade Classification System is listed in Table 2.²⁴

Management Of Diabetic Foot Ulcer

Management of DFU mainly aims to obtain wound closure which requires a

multidisciplinary approach. It depends on Severity, Vascularity, Infection status and also associated biomechanics related pathological factors of the foot.

Management of DFU includes:

1. Control of diabetes
2. Control of infection
3. Local treatment of the ulcer
4. Various types of surgery for diabetic ulcer of the foot
5. Care of the patient as a whole

Table 2: Wagner DFU Grade Classification System

Grade 0	No ulceration in a high-risk foot
Grade 1	Superficial ulceration
Grade 2	Deep ulceration that penetrates up to tendon, bone or joint
Grade 3	Osteomyelitis or deep abscess
Grade 4	Localized gangrene / Forefoot gangrene
Grade 5	Extensive gangrene requiring major amputation / Full foot gangrene

DISCUSSION

Prameha/ Madhumeha – Diabetes and It's Types

Margavarana is a result of accumulation of *Kapha* or *Pitta dosha* in the *Vatavaha srotas*. Due to respective *Nidana sevana*, it leads to *Vataja Prameha*. In *Prameha*, *Dhatuksaya* is an invariable consequence of *Aparipakwata* of *Dhatu*.

Acharya Sushruta has categorized the existence of *Sthula* and *Krisa* varieties of

Prameha and *Acharya Charaka* has prescribed different lines of treatment for the *Sthula* and *Krisa Pramehi*. He has also asserted that whenever a patient present with *Madhupama Mutra*, a wise physician should always consider the possibilities of *Madhumeha* due to *Vata* as a result of *Ksinata* of *dosha* and *Madhumeha* due to *Kapha* as a result of *Santarpana*.

It is very clear from *Acharya charaka's* explanation that *Madhumeha* in *Krisa* occurs in the event of a relative *Vata Vriddhi* in comparison to the other *dosha*. These persons may have been *Sthula* in the beginning but would have become *Krisa* due to *Dhatuksaya*.

On the other hand, *Krisa Madhumehi* are patients with *Bija dosha*. Hence, when such a *Rogi* consumes the *Nidana* of *Vata Vriddhi*, he develops *Madhumeha* sooner than a *sthula rogi*, who always indulges in *Tarpana ahara*. *Sthoolata* is also a condition due to *Bija dosha* and this *Bija dosha Sthaulya rogi* is more under the risk of developing the *Madhumeha* than the *Jatottara sthauilya rogi*.

For better understanding, *Sahaja Prameha* can be considered as Type 1 DM, *Apathyanimmitaja Prameha* which is further classified as *Santarpanotta Prameha* resulting in *Sthoola Pramehi* and *Apatarpanotta Prameha* resulting in *Krsha Pramehi* can be considered as Type 2 DM which is of Obese and Non-Obese respectively.

Importance of Early Diagnosis and Management of Prameha

Prameha in relation to DM is a complex disease, known as Silent Killer due to its insidious onset even in absence of symptoms. In the early phase *Kaphaja Prameha* occurs which goes unnoticed till the onset of actual symptoms which is noticed in *Vataja Prameha*. If even then neglected from proper diagnosis or management, *Upadravas* occur with symptoms of *Daha* which can be correlated to Diabetic neuropathy and *Prameha pidakas* which results into formation of *Vrana* called *Madhumeha janya Dusta vrana* which can be understood in terms of Diabetic Foot Ulcer. This DFU finally might require amputation of Lower limb (or part of it) if *Kotha* or gangrene occurs. Thus, to preserve the limb, preventive measures have to be taken up by *Pramehi* once the diagnosis is confirmed. To prevent this chain of complications which occurs after *Prameha*, early diagnosis and management of *Prameha* plays a significant role.

Why Madhumehajanya Dushta Vrana occurs predominantly in lower limb?

According to *Acharya Sushruta*, the incidence of the *Prameha pidaka* are more in lower limbs because of the *Durbalata* of the *Rasayani* which carry *Rasadi Dhatus* to the lower limbs.²⁵ *Dalhana* clarifies that the *Rasayani* are nothing but *Rasa, Pitta, Kapha* and *Sonita* carrying *Dhamani's* in the lower

limbs. The *Durbalata* of these *Dhamani's* are because of the *Pramanataha vridhi* and localization of of *Kapha, Meda* and *Vasa* in the *Sarira* especially in the lower limbs along with *Sarva sharira kledata* and *Sarira shaithilyata*. This gives rise to various *Upadravas* ranging from *Kandu, Daha* etc to form different types of *Prameha Pidaka* which finally on chronic state results into *Madhumehajanya dusta vrana*.

Madhumehajanya Dusta Vrana And DFU

Diabetic Foot ulcers based on its signs and symptoms can be understood in terms of *Madhumeha janya dusta vrana*. Uncontrolled DM results into DFU in the same way Uncontrolled *Prameha* results into *Madhumehajanya Dusta vrana* which is mainly characterised by its spreading nature and chronic healing. For its best management, involved *Dosha, Dushyas, Roga bala, Rogi bala* and *Avasta* of *Vyadhi* is to be well assessed and accordingly required *Kaya Shodana, Vrana Shodhana* and *Vrana Ropana* is to be advised with appropriate *Dravyas* to prevent from further complication of infection, Gangrene formation and in turn from amputation of Lower limb.

CONCLUSION

The disease burden of Diabetes mellitus is primarily due to its multiple complications involving almost every system, as it is the complication which causes

disturbance in life of an individual compared to disease as such. Foot is the point of contact between the body and the earth responsible for various mechanical activities. Chronic Diabetes Mellitus causing Diabetic Foot results into DFU, which if not managed on time might progress to the level of amputation of lower limb (or part of lower limb). This makes the life of an individual miserable due to body disfigurement, loss of productivity, increasing dependency and deterioration of quality of life. This is understood in terms of *Madhumeha janya Dusta vrana* in Ayurveda which can be well managed by adopting *Kaya Sodhana* followed by *Vrana Shodhana* and *Vrana Ropana Chikitsa*. Thus, Early diagnosis and Maintenance of DM by required timely management, prevention of DFU plays a vital role to preserve the lower extremity and improve quality of life in an individual.

REFERENCES

1. Agnivesha, Charaka samhita of Acharya Charaka, Dridhabala, edited by Vaidya Jadavji Trikamji Acharya. Nidana Sthana. Ch.4. Varanasi: Chaukhambha Sanskrit Sansthan; 2016 Shloka No: 10-11, p. 211-6.
2. Agnivesha, Charaka samhita of Acharya Charaka, Dridhabala, edited by Vaidya Jadavji Trikamji Acharya. Nidana Sthana. Ch.4, Ver. 44-45. Varanasi: Chaukhambha Sanskrit Sansthan; 2016. p. 215.
3. Agnivesha, Charaka samhita of Acharya Charaka, Dridhabala, edited by Vaidya Jadavji Trikamji Acharya. Nidana Sthana. Ch.4, Ver. 48. Varanasi: Chaukhambha Sanskrit Sansthan; 2016. p. 215.
4. Kannan, Ramya (2019-11-14). "India is home to 77 million diabetics, second highest in the world". The Hindu. ISSN 0971-751.
5. World Health Organization: Fact Sheets – Diabetes (10/11/2021). <https://www.who.int/news-room/fact-sheets/detail/diabetes>
6. Shankhdhar K, Shankhdhar LK, Shankhdhar U, Shankhdhar S. Diabetic foot problems in India: an overview and potential simple approaches in a developing country. Curr Diab Rep. 2008;8(6): 452-457. doi:10.1007/s11892-008-0078-y4.
7. Agnivesha, Charaka samhita of Acharya Charaka, Dridhabala, edited by Vaidya Jadavji Trikamji Acharya. Chikitsa Sthana. Ch.6, Ver. 4. Varanasi: Chaukhambha Sanskrit Sansthan; 2016. p. 445.
8. Agnivesha, Charaka samhita of Acharya Charaka, Dridhabala, edited by Vaidya Jadavji Trikamji Acharya. Chikitsa Sthana. Ch.6, Ver. 5-6. Varanasi: Chaukhambha Sanskrit Sansthan; 2016. p. 445.
9. Agnivesha, Charaka samhita of Acharya Charaka, Dridhabala, edited by Vaidya Jadavji Trikamji Acharya. Chikitsa Sthana. Ch.6, Ver. 8. Varanasi: Chaukhambha Sanskrit Sansthan; 2016. p. 445.
10. Agnivesha, Charaka samhita of Acharya Charaka, Dridhabala, edited by Vaidya Jadavji Trikamji Acharya. Sutra Sthana. Ch.17, Ver. 78-

82. Varanasi: Chaukhambha Sanskrit Sansthan; 2016. p. 103.
11. Sushruta, Sushruta Samhita of Sushruta, Dalhana commentary, edited by Vaidya Jadvji Trikamji Acharya, Chikitsa sthana. Ch. 1, Ver. 3. Varanasi: Chaukhambha Sanskrit Sansthan; 2015. p. 396.
12. Sushruta, Sushruta Samhita of Sushruta, Dalhana commentary, edited by Vaidya Jadvji Trikamji Acharya, Sutra sthana. Ch. 22, Ver. 7. Varanasi: Chaukhambha Sanskrit Sansthan; 2015. p.108.
13. Agnivesha, Charaka samhita of Acharya Charaka, Dridhabala, edited by Vaidya Jadvji Trikamji Acharya. chikitsa Sthana. Ch.25, Ver. 24-25. Varanasi: Chaukhambha Sanskrit Sansthan; 2016. p. 593.
14. Sushruta, Sushruta Samhita of Sushruta, Dalhana commentary, edited by Vaidya Jadvji Trikamji Acharya, Chikitsa sthana. Ch. 1. Varanasi: Chaukhambha Sanskrit Sansthan; 2015. p.396-408.
15. Sushruta, Sushruta Samhita of Sushruta, Dalhana commentary, edited by Vaidya Jadvji Trikamji Acharya, Chikitsa sthana. Ch. 13. Varanasi: Chaukhambha Sanskrit Sansthan; 2015. Shloka No: 4-35. p.456-7.
16. Sushruta, Sushruta Samhita of Sushruta, Dalhana commentary, edited by Vaidya Jadvji Trikamji Acharya, Chikitsa sthana. Ch. 1, Ver. 8. Varanasi: Chaukhambha Sanskrit Sansthan; 2015. p.397.
17. Sushruta, Sushruta Samhita of Sushruta, Dalhana commentary, edited by Vaidya Jadvji Trikamji Acharya, Sutra sthana. Ch. 19, Ver. 16-17. Varanasi: Chaukhambha Sanskrit Sansthan; 2015. p.91.
18. Sushruta, Sushruta Samhita of Sushruta, Dalhana commentary, edited by Vaidya Jadvji Trikamji Acharya, Sutra sthana. Ch. 23, Ver. 7-9. Varanasi: Chaukhambha Sanskrit Sansthan; 2015. p.111.
19. Alvin C. Powers, Kevin D. Niswender, Carmella Evans-Molina. Diabetes Mellitus: Diagnosis, Classification, and Pathophysiology. In: Jameson J.L, Fauci A.S, Kasper D.L, Hauser S.L, Longo D.L, Loscalzo J. Editors. Harrison's principles of internal Medicine. Ch. 396, 20th ed. New York: McGraw Hill Education; 2018.p. 2853.
20. Ounpuu S. The biomechanics of running: a kinematic & kinetic analysis. AAOS Instructional Course Lectures 1990;39:305–18.
21. Cavanagh PR, Ubrecht JS. Clinical plantar pressure measurements in diabetes: rationale and methodology. In Boulton AJM, Connor H, Cavanagh PR (eds), The Foot in Diabetes. Blackwell: Oxford, 1994.
22. Shobhana R, Rao PR, Lavanya A, Vijay V, Ramachandran A. Cost burden to diabetic patients with foot complications - a study from southern India. J Assoc Physicians India. 2000;48(12):1147-1150.
23. Larsson J, Agardh CD, Apelqvist J, Stenstrom A. Long-term prognosis after healed amputation in patients with diabetes. Clin Orthop Relat Res. 1998;(350):149-158.
24. Wagner EW. The dysvascular foot: a system for diagnosis and treatment. Foot Ankle. 1981;2:64122.

Narayan K.R, Siddanagouda A Patil, Prashanth A.S. Disease Review on *Madhumehajanya Dusta Vrana Vis-À-Vis* Diabetic Foot Ulcer, Jour. of Ayurveda & Holistic Medicine, Volume-X, Issue-II (Mar.-April.2022).

25. Sushruta, Sushruta Samhita of Sushruta, Dalhana commentary, edited by Vaidya Jadvi Trikamji Acharya, Chikitsa sthana. Ch. 12, Ver.
8. Varanasi: Chaukhambha Sanskrit Sansthan; 2015. p.454.

CITE THIS ARTICLE AS

Narayan K.R, Siddanagouda A Patil, Prashanth A.S. Disease Review on *Madhumehajanya Dusta Vrana Vis-À-Vis* Diabetic Foot Ulcer, *J of Ayurveda and Hol Med (JAHM)*. 2022;10(2): 1-14

Source of support: Nil

Conflict of interest: None Declared