

UNDERSTANDING THE CONCEPT OF DIABETIC PERIPHERAL NEUROPATHY IN AYURVEDA

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Abstract

Diabetic Peripheral Neuropathy (DPN) is one of the most troublesome micro vascular complications of Diabetes Mellitus (DM) and present in 30-50% of all Diabetics. Hence it needs an hour to understand the concept of DPN in Ayurveda so as to form an effective management protocol. Madhumeha is one among the four varieties of vataja prameha which has similarity with DM. DPN is one of the complication of DM. Madhumeha being one of maharoga (big disease), due to chronicity it attains complication stage. DPN is understood in ayurveda on its symptoms such as daha (burning sensation), harsha (tingling sensation), suptata (numbness), shosha (wasting), mamsopachaya (muscle wasting), dourbalya (weakness), anga sada (lethargy), etc. which are attributed to Madhumehajanya dhatukshayaja stage. Thus, in this review article an effort has been made to understand the concept of DPN explained in Ayurveda.

Key words: Diabetic Peripheral Neuropathy; Madhumeha; Diabetes Mellitus.

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INTRODUCTION

Diabetic Peripheral Neuropathy is one of the most troublesome micro vascular complications of Diabetes Mellitus. Diabetic Peripheral Neuropathy is a Common disease, often severe but frequently unreported and inadequately treated. One in 6 Diabetics has neuropathy is that approximately 50 percent of patients with Diabetics will eventually develop neuropathy and which is the major cause for lower limb amputation.^{[1][2]}

The prevalence of neuropathy is related to age, duration of Diabetes Mellitus and the quality of metabolic control. Trial studies on the Diabetic Control & Complications proved that Glycosylated Haemoglobin (HbA1c) reduction from 9 to 7% for a mean follow up of 6.5 years was able both to reduce the onset of Diabetic Peripheral Neuropathy (from 9.6% to 2.8%) and to slow its progression.^{[3][4]} However, Euglycaemia is only able to halt the progression, rather than reverse it, once the nerve damage has been established.^[5] In this article, an effort has been made to understand DPN in Ayurveda. Madhumeha is one among the four varieties of vataja prameha which has similarity with the disease Diabetes Mellitus. Diabetic Peripheral Neuropathy is one of the Upadrava (complication) of Diabetes Mellitus. Complications are those which develop after the onset of main disease and it is dependent on the pradhana vyadhi (main disease). It will have the same nidana (etiology), dosha, dushya as that of main disease.^[6] The upadrava (complication) will have the samprapti (pathology) of its own. When main disease is managed well, complication will disappear.^[7] According to Charaka samhita, it is mentioned in the context of madhumeha, due to strong bondage between morbid doshas and dushyas, madhumeha attains asadhya (incurable) stage, which in turn causes any upadrava (complication).^[8] The various nidanas (etiologies), dosha dushya sammurchana and further progression in samprapti (pathology) are similar to that of

Diabetic Peripheral Neuropathy. Daha (burning sensation), suptata (numbness), harsha (tingling sensation), shosha (wasting), dourbalya (weakness), anga sada (lethargy) are the symptoms attributed as the upadrava (complication) of Madhumeha are almost similar to the description of Diabetic Peripheral Neuropathy. Above said features have been analysed under its etiology, pathogenesis and site of manifestation.

Physiological consideration of peripheral nerve as per Ayurveda

In Diabetic Peripheral Neuropathy, functions of peripheral nerves are impaired. As per Ayurveda; functions of peripheral nerves are mainly attributed to Vata dosha in particular to Vyana Vata. As normal Vata dosha does the functions in the body such as utsaha shakti (enthusiasm), shwasa prashwasa kriya (respiration), chesta (motor and reflex activities) etc. Vata dosha act as receptor, as well as a stimulator. In other words, it initiates the functions in the body and receives the stimulation from external environment. Vata dosha is invisible, only its functions are visible.^[9] Vata dosha is sookshma (minute), swayambo or sarvagata (moves everywhere).^[9] These qualities of Vata dosha can be compared with that of a nerve impulse. The primary function of a peripheral nerve is to transmit signals from the spinal cord to the rest of the body or to transmit sensory information from the rest of the body to the spinal cord. A nerve impulse is self originated, propagated, it reaches anywhere. Hence, is compared with the functions of Vata dosha. Abnormal functions of Vata dosha are prerequisite for normal functions. Hence, involvement of peripheral nerves in disease DPN is considered based on abnormal functions of Vata dosha.

Disease review as per Ayurveda

Diabetes Mellitus which has similarity to the description of the disease madhumeha in

Ayurveda. In Madhumeha, due to further nidana sevana, dosha and dhatu dushti will attain upadrava (complication) stage and exhibit the symptoms. They are daha (burning sensation), suptata (numbness), mamsa shosha (wasting), kampa (tremor), dourbalya (weakness), anga sada (lethargy) which are the symptoms of Diabetic Peripheral Neuropathy.^[10] Diabetic Peripheral neuropathy is one of the major micro vascular complications of Diabetes mellitus.^[10] Hence, disease has been considered as complication of Madhumeha. Disease is dealt in detail as per Nidana panchaka. Symptoms such as daha (burning sensation) and suptata (numbness) are also mentioned in classics in the premonitory symptoms of prameha. In ancient time, there was lack of hospitalisation and lab investigations. Diagnosis used to be delayed by which disease already reaches the upadrava avasta. Hence, whatever mentioned in premonitory symptoms of madhumeha are actually complications of madhumeha itself.

Nidana (etiology)

Prime etiological factor affecting DPN depend on glycaemic level. The other factor which influences is chronicity of DM. According to Ayurveda, person who indulges in madhumeha etiologies causes continuation of vicious cycle of madhumeha, which further leads to dhatu kshaya. Due to dhatu kshaya, aggravation of vata takes place and attains upadrava avasta (DPN). Hence etiologies of Madhumeha and Dhatu kshayaja etiologies are considered as etiologies of DPN.

The Nidanas of Madhumeha can be studied under the following headings:

1. Samanya Nidana of Prameha
2. Madhumeha Nidana

1. Samanya Nidana of Prameha

Aharaja nidanas (food articles causing the disease) are mainly which aggravate Kapha

dosha Rasas (tastes) which aggravate Kapha dosha are madhura (sweet), amla (sour) and lavana (salt). Based on gunas (qualities) are guru (heavy), snigda (unctuous) and pichila (slimy). Viharaja nidanas (habits causing the disease) in the causation of prameha are asya sukha (sitting in comfort chair for prolonged period), divaswapna (day sleep) and avyayama (lack of physical exercise).^[11]

It is mentioned in Sushruta Samhita; prameha, if neglected will ultimately turns into madhumeha stage and which is incurable.^[11] Madhumeha is mainly due to Vata dosha predominance. In due course of time, due to further etiologies of madhumeha, aggravation of Vata dosha and due to strong bondage between morbid doshas and dushyas, madhumeha attains asadhya (incurable) stage, which in turn causes any upadrava (complications).^[8] Hence, the upadrava (complication) of madhumeha (i.e DPN) will manifest.

Samprapti (pathology)

Samprapti of Diabetic Peripheral Neuropathy studied under two headings,

1. Samanya samprapti of prameha
2. Madhumeha samprapti

1. Samanya samprapti of Prameha

Due to indulgence in various nidanas, vitiation of tridosha takes place, but the specific factor is kapha dosha. Due to excessive kleda in prameha roga formation of bahudrava shleshma occurs. Prakupita kapha dosha leads to agnimandya. Due to agnimandya, annarasa (digestive juice) is not properly formed and production of ama takes. Ama vitiates all other doshas, triggering the onset of disease. Ama causes srotodusti leading to formation of aparipakwa (unformed) dhatus. Increased kleda and ama deteriorates the functional and structural entities of dhatus causing dhatu shaithilya. Prakupita Kapha dosha, spreads all

over the body affects the dhatus wherever shitalatha has occurred and which mixes with bahu abadda medas because of similar qualities of Meda and Kapha and also due to pathological increase of Medo dhatu. Increased kleda, morbid dosha dushyas during circulation reaches the mutrashaya (bladder). Here all the kleda bhavas gets converted (mixes) and is expelled out through mutrashaya (bladder). In due course of time kapha dosha, Rasa, Rakta, Mamsa, Medo dhatus gets further vitiated. They lose their dhatu sara and expelled through urine leading to ojonasha.

2. Madhumeha samprapti

In madhumeha, due to various nidanas, Vata pradhana tridosha vitiation takes place; hence two types of samprapti manifests in Madhumeha. They are Avarana and dhatu kshaya.

a. Avarana samprapti

Excessive Kapha, Pitta, Meda and Mamsa produce Avarana (obstruction) to the gati of vata dosha. Thus, vata dosha becomes vitiated. Vata dosha takes Ojas out of the body through Basti and produces Madhumeha.^[12] When Avarana samprapti continued for longer period will attain dhatukshaya avasta and dhatukshayaja samprapti will continue in further stages of disease process.

b. Dhatu kshayaja samprapti

When Vata in aggravated stage; relatively Pitta and Kapha will be decreased in quantity (though they are in prakopa avasta). This is due to taratama bhava. This type of taratama bhava also causes a series of changes with the further aggravation of Vata dosha and kshaya of dhatus.

Aggravated Vata causes elimination of Dhatus through the passage of Basti (bladder) and results in Dhatukshaya. Prakupita Vata and dhatukshayaja avasta results in manifestation of symptoms such as daha(burning sensation), swapa (numbness), harsha (tingling sensation), shola (Pain), mamsa shosha (wasting), anga glani (malaise), stambha (stiffness), kampa (involuntary movements), dourbalya (weakness) and all other symptoms of Dhatu kshaya which are the upadrava avastha (complication stage) of madhumeha. These symptoms are attributed to Diabetic Peripheral Neuropathy.

Roopa (Signs and symptoms of DPN)

The symptoms such as Burning sensation (daha), Tingling sensation (cumcumayana), Pricking sensation (shoola) and Numbness (suptata) are the main sensory symptoms seen in initial stages of DPN. Hence these can be considered as important clinical features of DPN. Most presenting clinical feature such as daha and cumcumayana are attributed to prakupita Pitta and Vata dosha, Shoola(Pricking sensation) is undoubtedly due to prakuptia Vata dosha and Suptata(numbness) is due to combination of prakupita Kapha & Vata dosha. Some of the late manifesting symptoms of DPN are dourbalya (weakness in extremities), mamsa shosha (wasting), kampa (tremor) are attributed to Vata prakopa and due to diminision of dhatus.

DISCUSSION

While discussing the nidana of prameha, due to excessive intake of madhura rasa (sweet taste) causes Kapha dosha prakopa, agnimandya and amotpatti which further cause dushti of Rasa and Medo dhatu because of same qualities. Excessive intake of amla rasa

(sour taste) causes Pitta prakopa, Rakta dushti and shitalatha of dhatus. Excessive intake of lavana rasa (salt taste) increases kledatva in the body. Similarly, gunas (qualities) such as guru (heavy), snigda (unctuous), picchila (slimy) causes Kapha dosha prakopa, which also causes Rakta and Medo dhatu dushti. Viharaja nidanas mentioned in nidanas of prameha will ultimately cause Kapha prakopa and also affects Medo dhatu in terms of santarpana. Hence, the person who over indulges in all these nidanas in him Kapha, Pitta, Rasa, Rakta and Medo dhatus will be vitiated. While discussing the nidanas of Madhumeha both aharaaja and viharaja causes prakopa of Vata dosha and they are apatarpaka in nature. Vata prakopaka and apatarpana nidanas will cause Dhatu kshaya, hence the upadrava of madhumeha i.e. DPN will manifest.

While discussing the samprapti of prameha i.e. pathological process of prameha and formation of Ama can be compared to formation of AGEs and sorbitol. Both are unwanted metabolites doing malnourishment. The enzyme Aldose Reductase converts glucose to sorbitol. Sorbitol then is metabolised to fructose. The increased sorbitol has detorious effect on nerve conduction attributed to the Schwann cell damage due to the increased osmolarity and triggers autoimmunity leading to nerve damage.^[13] By analysing samprapti of prameha i.e., the process of formation of ama, dosha vitiation, vitiation of dhatus and further ojonasha, it can be said that, initiation of samprapti of DPN begins from the samprapti of Prameha itself.

Samprapti of madhumeha can be compared to Axonal degeneration and segmental demyelination changes of nerves in DPN. In the pathophysiology of DPN, Glycated nerve protein causes alteration in myelin macrophage interaction causes axonal degeneration and segmental demyelination. Due to decreased deformability causes hyper viscosity, leading to tissue hypoxia causing

nerve dysfunction. Thus the peripheral nerve in neuropathy with a diseased axon manifests clinically as loss of sensation (Numbness or other signs of neuropathy) due to axonal degeneration and segmental demyelination, also occurrence of spontaneous pain due to axonal sprouting in the area supplied by the affected nerve like pricking, burning or tingling type of pain.^[14] Hence Axonal degeneration and segmental demyelination can be understood as madhumehajanya dhatukshayaja stage.

By analysing nidana (etiology) and samprapti (pathology), it clearly indicates that Vata dosha is the prime dosha involved the disease process of DPN, followed by Pitta and Kapha. Dhatus involved are Rasa, Rakta, Mamsa, Medo dhatu and in later stages Majja, Shukra and Ojas also.

CONCLUSION

Thus by conceptual analysis of the available literatures regarding DPN, the following conclusions can be drawn;

Diabetic Peripheral neuropathy is a complex multifactorial disorder with varied clinical features. It cannot be directly correlated to any predefined condition in Ayurveda. Based on Nidana, Dosha dushya sammurchana and further progression in the samprapti of madhumeha, it can be considered as one of the upadrava (complication) stage of madhumeha. Nature of this stage resulting from madhumehajanya dhatukshayaja pathology. Clinical presentation based on symptoms of dhaukshayaja stage of madhumeha.

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