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SYSTEMATIC REVIEW OF DEŚA AS A NIDĀNA OF MADHUMEHA (DIABETES MELLITUS) - A META-ANALYSIS STUDY

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ABSTRACT

The prevalence of diabetes is rapidly rising all over the globe at an alarming rate. It is no longer considered a disease of affluent nation alone; it has become a global problem, a major epidemic of the 21st century showing no sign of abating. It is a well-known fact that 'Deśa' is an important component of Nidāna. Deśa influences the eating habits & lifestyle of an individual; these lifestyles in turn lead to various metabolic disorders such as Madhumeha (Diabetes Mellitus). Wide range of work on Madhumeha has been done in Ayurveda institutes but the specific aspect of Deśa as a nidāna of Madhumeha (Diabetes Mellitus) is yet not carried out. In the present study we tried to establish epidemiology (Nidānātmaka) study from major Āyurveda institutes in India (Deśa). Research work carried out in these institutes in the past 5 years were collected, collated and reviewed systematically for trends in pattern of Nidānā-Paṁcaka of Madhumeha w.s.r. to Deśa. Through Āyurvedika principle and with the help of modern research facilities, better treatment module can be worked out. In Roganidāna, emphasis is given to Pancanidāna, so in meta-analysis study we tried to find prevalence of different type of Nidāna (Hetu / Causative factors) & Upashaya (Therapy) of Madhumeha which is described in Āyurveda along with parameters of Diabetes Mellitus. Effort was made to decide prevalence of type of Madhumeha which could be of help in deciding effective treatment.

Keywords: *Madhumeha*, Diabetes Mellitus, epidemiology, *Nidāna, Upashaya*, Therapy.

INTRODUCTION

The systematic study of any disease is incomplete without preliminary work on epidemiology related to the particular disease. The need for and importance of epidemiological study is evident by the definition and purpose of such study which states- "The study of the distribution and determinants of health-related states or events in specified population and the application of the study to the control of health problems"[1.]

By identifying risk factors of chronic diseases, evaluating treatment modalities and health services it has provided new opportunities for prevention, treatment, planning and providing effectiveness and efficiency of health services.

Epidemiology of Diabetes in India:

The prevalence of diabetes is rapidly rising all over the globe at an alarming rate. It is no longer considered a disease of affluent nation alone; it has become a global problem, a major epidemic of the 21st century showing no sign of abating. India leads the world with largest number of diabetic subjects earning the dubious distraction of being termed the 'Diabetic capital' of the world. According to Diabetes Atlas 2006 published by the International Diabetes Federation, the number of people with diabetes in India currently around 40.9 million is expected to rise 69.9 million by 2025 unless urgent preventive steps are taken. After critical analysis of all those epidemiological studies conducted in India, some conclusion has drawn which are-

Asian Indian Phenotype – It refers to certain unique clinical and biochemical abnormalities in Indians which include[2].

o Increased insulin resistance
o Greater abdominal adiposity i.e., higher waist circumference despite lower BMI.
o Lower adiponectin level
o Higher sensitive C-reactive protein levels
a) Changed dietary pattern and decreased physical activity.
b) Prevalence of microvascular complication of Diabetes Mellitus like retinopathy and nephropathy

are comparatively lower in Indians. Prevalence of premature coronary artery disease is much higher than other ethnic groups.

c) Shift in age of onset of diabetes to younger group
d) Migration is also important in Diabetes as also brings social and cultural changes, Misra and colleges reported that migration from rural to urban slums in a metropolitan city in India lead to obesity, glucose intolerance and dyslipidemia. Other studies show migrant populations from developing countries to developed countries have high prevalence of diabetes.

All above points show relevance of epidemiology of Diabetes Mellitus. With the help of epidemiology new etiological factors, pathogenesis, precipitating factors, measure of prevention comes into light. In the *Āyurvedika* view, no such study has been done till 2010. Scholar has selected-Systemic Review of *Deśa as a Nidānātmaka* (epidemiological) factor of *Madhumeha* (Diabetes Mellitus) for finding prevalence of different *Nidānā* of *Madhumeha* in different *Deśa (region)* of India.

Aims and objectives:

• To conduct a systematic Review of *Deśa* as a *Nidānātmaka* (Epidemiological) Factor in *Madhumeha* (Diabetes Mellitus)
• Systemic Review of PG dissertation on *Madhumeha* of major Research institutes situated in different part of India taking consideration of *Deśa*. (*Ānūpa*, *Jāṁgala*, and *Sādhāraṇa* deśa)
• To collected, collated and analyze systematically for trends in pattern of *NIdāna* of *Madhumeha*
• Appraisal of research drug and results thereof.

Materials and Methods:

Survey based on the CRF prepared on the basis of this meta-analysis study incorporating *Nidāna* (*Hetu* / Causative factors) as well as Drug were conducted, Attempt was made to study the Prevalence and Pattern of *Madhumeha* according to *Deśa*.

Six institutes belonging to different *Deśa* were selected from all over the country viz: Paprola (North-

Ānūpa Deśa) from Himalaya, IPGT&RA-Jamnagar from western coast (*Ānūpa Deśa*), B.H.U.(East, *Sādhāraṇa Deśa*), N.I.A.- Jaipur from central part (*Jāṁgala Deśa*), Nagpur(Central India-*Sādhāraṇa Deśa*) and Udupi(South India- *Ānūpa Deśa*). Research work carried out in these six institutes in the past 5 years were collected, collated and reviewed systematically for trends in pattern of *Nidānā-Paṁcaka* of *Madhumeha* w.s.r. to *Deśa*. Attempt was also made to carry out survey at other places where NIA sets up camps, *Ārogya Melā* etc. Name & place of the *Āyurveda* institutes belonging to different *Deśa* were selected from all over the country*:*

North - *Ānūpa Deśa*:

1] Rajiv Gandhi Govt. Post Graduate *Āyurveda* College Paprola, Distt. Kangra, H.P. 176115

Western coast - *Ānūpa Deśa*:

2] Institute for Post Graduate Teaching and Research in *Āyurveda* (IPGT & RA), Gujarat *Āyurveda* University, Jamnagar-361008 (Guj.)

South India - *Ānūpa Deśa*:

3] SDM College of *Āyurveda*, Kuthpady, Udupi-(Karnataka)

East - *Sādhāraṇa Deśa*:

4] Institute of Medical Sciences, Faculty of *Āyurveda*, Banaras Hindu University, Varanasi-221005(U.P.)

Central India - *Sādhāraṇa Deśa*:

5] Government *Āyurveda* College & Hospital, Nagpur (M.S.)

Central part - *Jāṁgala Deśa*:

6] National Institute of *Āyurveda*, Jaipur-302002(Raj.)

Observations & results:

Total 49 research work in the form of P.G. Dissertation were reviewed from six institutes belonging to different *Deśa* from all over the country viz: Paprola (North- *Ānūpa Deśa*) from Himalaya, IPGT&RA-Jamnagar from western coast (*Ānūpa Deśa*), B.H.U.(East, *Sādhāraṇa Deśa*), N.I.A.- Jaipur from central part (*Jāṁgala Deśa*), Nagpur(Central India-*Sādhāraṇa Deśa*) and Udupi(South India- *Ānūpa Deśa*). After overall review of 49 research work in the form of PG Dissertation from major *Āyurveda* institute belongs to different part of India following observations are comes out about **Nidāna Sevana**:-

Table 1] Āhāra: Preferred Rasa & Guna in Ānūpa deśa:

1] *Ānūpa deśa*		
Paprola [3]	**Jamnagar [4]**	**Udupi [5]**
Rasa: *Madhura + Amla* *Guṇa*: *Guru, Snigdha Abhiṣyaṁdi* **Type:** Mixed **Specially:** Curd, Rice Potato,Paneer, *Navannapana*, *Grāmya māṁsa*, Alcohol	*Rasa*: *Madhura + Amla* *Guṇa*: *Guru, Snigdha Abhiṣyaṁdi.* **Type:** Veg.> Mixed *Adhyaśana* and *Viruddha* *Specially:* milk and milk products, curd, potato, Rice and sweet fruit.	*Rasa*: *Madhura + Amla* *Guna*: *Guru, Picchila Abhiṣyaṁdi, Snigdha* **Type:** Mixed > Veg. *Viṣamāśana* **Specially:** *Curd+Rice, Rice product-īḍali, dosā milk products, Jaggery, Ānūpa audaka māṁsa*

Ānūpa deśa: maximum no. of diabetes patients was taking Madhura + Amla rasa dominant, *Guru, Snigdha Abhiṣyaṁdi* Āhāra in all regions of *Ānūpa deśa*.

Most of the diabetes patients were taking Mixed (Veg+non-veg.) type of diet in Paprola and Udupi region while vegetarian types of diet were taking in Jamnagar region.

Table 2] Āhāra: Preferred Rasa & Guna in *Sādhāraṇa deśa* and *Jāṁgala deśa*:

2] *Sādhāraṇa deśa*		3] *Jāṁgala deśa*
Varanasi [6]	**Nagpur [7]**	**Jaipur [8]**

Rasa: Ati-*Madhura, Lavaṇa* **Guṇa:** *Guru*, Abhiṣyaṁdi, *Snigdha.* **Type:** Veg.> Mixed *Adhyaśana* and *Viruddha* **Specially:** Sweets, Ghṛta, Milk & Milk products Like- Curd, lassi, , high calories veg. snacks, fast food.	**Rasa:** *Madhur, Katu* **Guṇa:** *Guru*, VIdāhī *Abhiṣyaṁdi,* **Type:** Mixed=Veg. *Viruddhāśana* **Specially:** variety of Rice, Milk & milk products, Curd, *Grāmya, Ānūpa* & *Audaka māṁsa*, Alcohol, fast food.	**Rasa:** Ati-*Madhura* **Guṇa:** *Guru*, Ati-*Snigdha*, *Abhiṣyaṁdi.* **Type:** Veg. > Mixed *Adhyaśāna* **Specially:** variety of sweets, milk & milk products, *Ghṛta*, curd , oily or fatty foodstuffs

Sādhāraṇa deśa: Maximum no. of patients was taking *Madhur* rasa followed by *Lavaṇa* and *Kaṭu rasa* dominant, *Guru, Snigdha VIdāhī Abhiṣyaṁdi, Āhāra*. Most of the diabetes patients were taking vegetarian type of diet in Varanasi region while Mixed (Veg + non-veg.) types of diet and *Viruddhāśana* were taking in Nagpur region.

Jāṁgala deśa: Maximum no. of patients of diabetes were taking Ati-*Madhura rasa*, Ati-*Snigdha*, *Guru*, *Abhiṣyaṁdi*. *Adhyaśana* and vegetarian type of diet and in Jaipur region.

Table 3] *Vihāra*: lifestyle and *vihāra* in *Ānūpa deśa*

1] *Ānūpa deśa*:		
Paprola [3]	**Jamnagar [4]**	**Udupi [5]**
Lifestyle: Sedentary *Vihāra*: *Ayvāyāma* (vehicles dependent)	**Lifestyle:** Sedentary & *regular Divāsvāpa, Tensive* **Vihāra:** *Swapnasukha* and *Ayvāyāma*	**Lifestyle:** Sedentary & less hard working *Vihāra*: *Ayvāyāma, Divāswapna*

Ānūpa deśa: Maximum no. of diabetes patients was having sedentary lifestyle and *Divāsvāpa*. *Ayvāyāma* in *Vihāra*

Table 4] *Vihāra*: lifestyle and *vihāra* in *Sādhāraṇa deśa* and *Jāṁgala deśa*:

2] *Sādhāraṇa deśa*:		3] *Jāṁgala deśa*
Varanasi [6]	**Nagpur [7]**	**Jaipur [8]**
Lifestyle: Sedentary & jolly(*Tyakta Chinta*) **Vihāra:** *Āsyasukha*	**Lifestyle:** Sedentary & stressful work. **Vihāra:** *Avyāyāma*	**Lifestyle:** Sedentary with job stress **Vihāra:** *Avyāyāma, Ālasya*

Sādhāraṇa deśa: Maximum no. of diabetes patients was having sedentary lifestyle with jolly nature in Varanasi region and sedentary lifestyle with stressful work in Nagpur region.

Jāṁgala deśa: Maximum no. of diabetes patients was having sedentary lifestyle with job stress and *Avyāyāma, Alasya in Vihāra*

Upashaya (Therapy):

According to Research work carried out in Āyurveda institutes belonging to different *Deśa* following therapy (Drug regimen) was given *Upashaya* in *Madhumeha:*

1] *Ānūpa Deśa*

A] Paprola[3] (North- *Ānūpa Deśa*):

Auṣadhi **(Durg)**: *Nilakaṁṭhi* (Ajuga bracteosa), *Tejapatra* (Cinnamomum tamala), *Methikā Bija* (trigenelia foenum)

Āhāra: Healthy diet, with low glycemic index food.

Vihāra: Exercise–Walking, gardening etc. Yogāsana

B] Jamnagar[4] (western coast -*Ānūpa Deśa*) :

i) *Śodhana therapy*: *Vamana Karma, Virecana Karma,*

ii) *Śamana therapy:* Gudamāra (*Gymnema sylvestre*)*, Māmejavā (E. littorale), Methikā Bija,* Vijaysārādi Kwātha Darvyādi Vaṭi, Rasona, Niśākatakādi Yoga, Medoghna Rasāyana Vaṭi, Nyogrodhādi Ghanavaṭi, Triphalādi Vaṭi and

Shilājitwadi Vaṭi, Nāga Bhasma, Vaṁga Bhasma, Makaradhwaja, Meha Mudgaravaṭi

Āhāra: restricted carbohydrate, fatty diet.

Vihāra: Avoid *Divāsvāpa, Exercise–Walking.*

C] Udupi [5] (South India- *Ānūpa Deśa*):

i) *Śodhana therapy:* Virecana Karma

ii) *Śamana therapy:* Asānadi kwātha, Kathaka Khadirādi Kaṣāy, Ākulyādi Yoga, Vaṁga Bhasma, Agnimaṁtha/ Arani*(Clerodendrum inerme (L) Gaertn)*, Arjunādi Curna, Niśā –Āmalaki, Dhātri- Niśā-Shilajatu Vaṭi(Madhusudan Vaṭi),

Āhāra: restricted carbohydrate, fatty diet.

Vihāra: Avoid *Divāsvāpa, Exercise–Walking*

2] *Sādhāraṇa deśa:*

A] B.H.U. Varanasi [6] (East, *Sādhāraṇa Deśa*):

Auṣadhi: Sadabahāra+ Tulasi+ Sharifa+Bilwa+Methika, Caturbijaj *Curṇa, Saptacakra (Salacia reticulata), Dhava (Anogeissus latifolia), Sālasārādi Gaṇa, Cirabilva (Hotoptelia integrifolia),* Rishyagandha / Paneer ka phula *(Withania coagulans Dunal.),* Amalaki *(Emblica officinalis).*

Āhāra: restricted carbohydrate, less sweet, low fatty, Avoid milk product and curd, lassī etc. *Vihāra:* Exercise–Walking, *Yogāsana.*

B] Nagpur [7] (Central India-*Sādhāraṇa Deśa*):

i) *Śodhana therapy:* Vamana Karma, Virecana Karma

ii) *Śamana therapy:* Ghana Satva of Kadar+*Khadira* and *Guggula, Kadarādi herbal compound, Guduci Satva, Śilājatādi Yoga, Neema* (Azadirachta indica) and *Karelā* (Momordica charantia).

Āhāra: restricted carbohydrates, fatty diet, avoid Alcohol, soft drink & fast food. *Vihāra: Exercise–Walking*

3] *Jāṁgala deśa*

A] Jaipur [8] (north-central part *Jāṁgala Deśa*):-

i) *Śodhana therapy:* Vamana Karma, Virecana Karma

ii) *Śamana therapy: Phalatrikādi Ghana Vaṭi, Paṁcatikta Ghana Vaṭī* and *Mustādi Kwātha, Dashmulādi Ghana Vaṭī, Jamvādi Yoga* and *Śilābhara Rasa,* Tab. Diab-care, "*Madhumehāri cūrṇa*", *Ojomehāṁtaka Yoga.*

iii) *Rasāyana* therapy: *Śilājit Rasāyana, Medhya Rasāyana*

Āhāra: restricted carbohydrate & fatty diet, less sweet item.

Vihāra: Exercise–Walking, cycling etc.

DISCUSSION

Research work carried out in six institutes belonging to different *Deśa* from all over the country in the past 5 years were collected, collated and reviewed systematically for trends in pattern of *Nidānā-Paṁcaka* of *Madhumeha* w.s.r. to *Deśa*. After overall review of 49 research work in the form of PG Dissertation from major *Āyurveda* institute belongs to different part of India following facts are comes out about **Nidāna Sevana**:-

a) *Āhāra:* Preferred *Rasa* & *Guna*:

Ānūpa deśa: maximum no. of diabetes patients was taking Madhura + *Amla rasa* dominant, *Guru, Snigdha Abhiṣyaṁdi Āhāra* in daily diet because of favourable(cold) climate induce good appetite(*Abhyavaharaṇa śakti* and *Jaraṇaśakti*) so people tend to eat this type of *Āhāra*. People having more amount of mix of *Madhura* and *Amla Rasa*, this type of diet is *Shaithilyakara, kleda Saṁcayakara Āhara* and evoke *Kapha Lakṣaṇa* in people. Most of the diabetes patients were taking Mixed (Veg+non-veg.) type of diet in Paprola and Udupi region while vegetarian type of diet was taking in Jamnagar region.

In Paprola mostly *Grāmya māṁsa*, used by people in their diet, Udupi is a coastal area where main source of *Ānūpa- audaka māṁsa* (fish and other sea products) were used by people in their diet. Jamnagar is mostly covered by population of Guajarati people those prefer vegetarian diet than non-vegetarian. *Sādhāraṇa deśa*: Maximum no. of patients was taking *Madhura rasa* followed by *Lavaṇa* and *Kaṭu rasa* dominant, *Guru, Snigdha VIdāhī Abhiṣyaṁdi, Āhāra.* Most of the diabetes patients were taking vegetarian type of diet in Varanasi region while Mixed (Veg + non-veg.) types of diet and *Viruddhāśana* were taking in Nagpur region. Varanasi (Banaras) is holy place of Hindu culture. In this area most of the

people are belonging to Brahmin caste who work as a Priest, so they prefer vegetarian type of diet with more amount sweet (*Madhura rasa*) and snacks(*Lavaṇa rasa)* in daily diet with *Adhyaśana* and *Viruddha type of diet.* Nagpur is situated in centre India where most of population are from various religion who takes mixed(Veg + Non-veg.) and *Viruddhāśana* type of diet.

Jāṁgala deśa: Maximum number of patients of diabetes were taking *Ati-Madhura rasa, Ati-Snigdha, Guru, Abhiṣyaṁdi. Adhyaśana* and vegetarian type of diet in Jaipur region. The environment of this area is *Rukṣa, Śuṣka* predominant. As a result of this, people tend to indulge in diet which is *Madhura* rasa predominant and rich in *Sneha* (oily or fatty foodstuffs). Most of the patients were afflicted towards *madhura, amla & lavana* rasa which are said to be *kapha prakopaka.*[9] *Lavana rasa* specially contributes in *Kledakara samprapti* of the disease.[10] Most of the patients had faulty diet pattern like *adhyashana, Ajeernashana & vishamashana* which causes metabolic derangement. All the dietary habits observed as *Nidana* suggested that majority of the patients having habit to take *Guru, Madhura, Snigdha* type of diet, which increase exclusively *Kapha & Meda*, the main *dośa* and *duṣya* of the disease. They play key role in the etiopathogenesis of the disease. From the modern point of view, certain food items have high glycemic index, which increase blood glucose level very quickly. These include Rice (58), Potato (56), *Bajara* (70), Banana (56), Grapes (46), Dates (103), Mango (55) etc. Thus, they increase blood glucose level quickly. In the ancient time there were no such facilities to find out the glycemic index of foods, but it was observed that the consumption of these foods, produce or increase the problem (like polyuria). That's why these foods have been mentioned under *nidana* of *Prameha.*

b) **Vihāra:**

Ānūpa deśa: Maximum no. of diabetes patients was having sedentary lifestyle and *Divāsvāpa. Ayvāyāma in Vihāra*

Paprola is hilly area so people from this area are using vehicles to go everywhere and becomes they are vehicle dependant, another fact is that the climate of this region is very cold even in summer, so people cannot get sweating on some exertion so accumulation of *kleda* in body becomes more. This may be one of the reasons in *Kapha-Medo- Duśti* due to their sedentary lifestyle and *Ayvāyāma.*

Sādhāraṇa deśa: Maximum no. of diabetes patients was having sedentary lifestyle with jolly nature in Varanasi region.

Sedentary lifestyle with stressful work in Nagpur region, as a Central part of India and highly developing industrial area in this region, the environmental pollution increase day by day, these environmental contaminants (e.g., air pollutants, persistent organic pollutants, etc.) may be secondary cause to Diabetes.

Jāṁgala deśa: Maximum no. of diabetes patients was having Sedentary lifestyle with job stress and *Avyāyāma, Ālasya* in Jaipur region.

Viharaja Nidana: Most of the patients from different *deśa* were indulging sedentary lifestyle like abstinence of physical & mental work *(Vyayamavarjana, Tyakta chinta)*, excessive sleep (*Atinidra)* etc. which are direct causative factors of the disease. All the sedentary life habits found as causative factors were because of modern fast life, where none is devoting time for exercise. The sedentary lifestyle again increases the *Kapha* and *Meda* leading to *Samprapti* of the disease. These factors may cause insulin resistance and decreases insulin sensitivity.

Exercise: Majority of the patients of different *deśa* were not doing exercise at all or doing less exercise. Exercise is extremely important in the management of diabetes because of its effect on blood glucose and free fatty acids. Exercise burns calories and helps to control weight, eases stress and tension, and maintains a feeling of well-being. In addition, regular exercise improves the body's response to insulin and may make oral anti-diabetic drugs and insulin more effective. It also promotes circulation, and lowers cholesterol and triglyceride levels, thus reducing the risk of cardiovascular disease. So, no exercise or less exercise may cause insulin resistance and reduced glucose utilization or insulin sensitivity. A recent meta-analysis showed that exercise reduces HbA1c lev-

els by an amount that is expected to reduce diabetic complications, without a mean effect on body weight.[11]

Upashaya (Therapy):

According to different geographical location (*Deśa)* it has been observed that, different treatment regimens has been advocated and practiced for the prevention and control of diabetes. These treatments have been enlisted as below-

1] *Ānūpa Deśa*

A] Paprola (North- *Ānūpa Deśa*) :

Auṣadhi **(Durg**): *Nilakaṁṭhi* (Ajuga bracteosa), *Tejapatra* (Cinnamomum tamala), *Methikā Bija* (trigenelia foenum).

People are using *Methikā Bija* choorna and *Tejapatra* as OHA have some significant relief. *Nilakaṁṭhi (Ajuga bracteosa)* is one of the drugs found in this area has showed anti-diabetic activity, and it is used by folk people to get relief from diabetes. In recent thesis work on anti-diabetes activity of *Nilakaṁṭhi* showed significant efficacy.[12]

*Āhāra***:** Healthy diet, with low glycemic index food.

*Vihāra***:** Exercise–Walking, gardening etc. *Yogāsana –Mayura Āsana, Paschimuttana Āsana.* Avoid Day time sleeping or excessive sleep.

B] Jamnagar (western coast -*Ānūpa Deśa*) :

i) *Śodhana* therapy: *Vamana Karma, Virecana Karma,*

ii) *Śamana* therapy: *Vijaysārādi Kwātha Darvyādi Vaṭi, Rasona, Niśākatakādi Yoga, Medoghna Rasāyana Vaṭi, Nyogrodhādi Ghanavaṭi, Triphalādi Vaṭi* and *Shilājitwadi Vaṭi, Nāga Bhasma, Vaṁga Bhasma, Makaradhwaja, Meha Mudgaravaṭi.*

People of this region are using *Gudamāra (Gymnema sylvestre)*, *Methikā Bija* and *Māmejavā (E. littorale)* as OHA to get some significant relief. *Vijaysārādi Kwātha* mostly used by IPGT &RA Institute in Jamnagar has significant result in Diabetes patients. *Bhasma* like *Vaṁga Bhasma*, *Svarṇa Bhsma* can be used with other anti-diabetic drugs to control the disease diabetes and its complications.

*Āhāra***:** restricted carbohydrate, fatty diet

*Vihāra***:** Avoid *Divāsvāpa, Exercise–Walking.*

C] Udupi (South India- *Ānūpa Deśa*):

i) *Śodhana* therapy: *Virecana Karma*

ii) *Śamana* therapy: Asānadi *kwātha, Kathaka Khadirādi Kaṣāy, Ākulyādi Yoga, Vaṁga Bhasma, Agnimaṁtha/ Arani(Clerodendrum inerme (L) Gaertn), Arjunādi Curna, Niśā –Āmalaki, Dhātri- Niśā-Shilajatu Vaṭi(Madhusudan Vaṭi). D*rugs like *Puga, Methika, Karela, Asana, Nishā, Amalaki, Khadira* are preferred in this area by most of the *Āyurvedika* physicians as they are easily and abundantly available.

It has been observed that the leaves of Clerodendrum inerme (*Agnimaṁtha/Arani*) are being used by folklore practitioner of Udupi region for the management of Diabetes mellitus. *Asanādi Kwātha* is more significantly used in and around Udupi region.

*Āhāra***:** restricted carbohydrate, fatty diet.

*Vihāra***:** Avoid *Divāsvāpa*, Exercise–Walking

Being in *Ānupa Deśa* by the practice of more *Kaphakara Āhāra* and *Vihāra*, the people are more susceptible to Diabetes Mellitus. When treating diabetes patients in *Ānūpa Deśa*, there is need to give *Śodhana* therapy like *Vamana* and *Virecana* before administration of any *Śamana* drug therapy for to see better efficacy of *Śamana* therapy drugs.[13]

2] *Sādhāraṇa deśa*:

A] B.H.U. Varanasi (East, *Sādhāraṇa Deśa*):

Auṣadhi: Sadabahāra+ Tulasi+ Sharifa+Bilwa+Methika, Caturbijaj *Curṇa, Saptacakra (Salacia reticulata), Dhava (Anogeissus latifolia*), *Sālasārādi Gaṇa, Cirabilva (Hotoptelia integrifolia*), Rishyagandha *(Withania coagulans Dunal.),* Amalaki *(Emblica officinalis).*

Panira kā phūla /Ḍoḍā panira/ Ṛshyagandhā (Withnia coagulence) is one of the drugs used by folk people in this area has showed anti-diabetic activity, in recent thesis work on anti-diabetes activity of *Ṛshyagandhā* (Withnia coagulence) showed significant efficacy.[14]

*Āhāra***:** restricted carbohydrate, less sweet, low fatty, Avoid milk product and curd, lassī etc.

Vihāra: Exercise–Walking, *Yogāsana.*

B] Nagpur (Central India-*Sādhāraṇa Deśa*):

i) *Śodhana* therapy: *Vamana Karma, Virecana Karma*

ii) *Śamana* therapy: *GhanaSatva* of Kadar+*Khadira* and *Guggula, Kadarādi herbal compound, Guduci Satva, Śilājatādi Yoga, Neem*a (Azadirachta indica) and *Karelā* (Momordica charantia).

Local people are using *Neem*a (Azadirachta indica), *Karelā* (Momordica charantia) and *Methi bīja* as an anti-diabetic home remedies to get some significant relief.[15]

Āhāra: restricted carbohydrates, fatty & fast foods. avoid Alcohol, soft drink.

Vihāra: Exercise–Walking

3] Jāṁgala deśa

A] **Jaipur** (north-central part *Jāṁgala Deśa*):

i) *Śodhana* therapy: *Vamana Karma, Virecana Karma*

ii) *Śamana* therapy: *Phalatrikādi Ghana Vaṭi, Paṁcatikta Ghana Vaṭī and Mustādi Kwātha, Dashmulādi Ghana Vaṭī, Jamvādi Yoga and Śilābhara Rasa*, Tab. Diab-care, *"Madhumehāri cūrṇa", Ojomehāṁtaka Yoga* were found as Research drugs of clinical trials conducted at NIA, Jaipur.

Generally, *Methi Bija* (*Dāna Methi*), different type of juice like *Karelā* juice used by local peoples themselves as an anti-diabetic in this area.

'Madhumehāri Curṇa' mostly used by physician in National Institute of Ayurveda, Jaipur has significant result in Diabetes patients.[16]

There is need to give *Rasāyana* therapy like- *Śilājit Rasāyana, Medhya Rasāyana* for prevention of further complications of Diabetes.[17]

iii) *Rasāyana* therapy: *Śilājit Rasāyana, Medhya Rasāyana*

Āhāra: restricted carbohydrate & fatty diet, less sweet item.

Vihāra: *Exercise–Walking, cycling etc.*

CONCLUSION

- *Deśa'* is an important component of *Nidāna of Madhumeha*. *Deśa* influences the eating habits & lifestyle of an individual; these lifestyles in turn lead to *Madhumeha.*

Nidāna Sevana-
Āhāra:

- *Ānūpa deśa*: maximum number of diabetes patients were found to be taking *Madhura + Amla* rasa dominant, *Guru, Snigdha Abhiṣyaṁdi* Āhāra in daily diet because of favourable (cold) climate induce good appetite (*Abhyavaharaṇa śakti* and *Jaraṇaśakti*) so people tend to eat this type of *Āhāra.*

- *Sādhāraṇa deśa*: Maximum no. of patients was taking Madhur rasa followed by Lavaṇa and Kaṭu rasa dominant, *Guru, Snigdha VIdāhī Abhiṣyaṁdi, Āhāra.*

- *Jāṁgala deśa*: Maximum no. of patients of diabetes were taking Ati-*Madhura rasa, Ati-Snigdha, Guru, Abhiṣyaṁdi* and *Adhyaśana* type of diet.

Vihāra:

- *Ānūpa deśa*: Maximum no. of diabetes patients was having sedentary lifestyle and *Divāsvāpa and Ayvāyāma in Vihāra*

- *Sādhāraṇa deśa*: Maximum no. of diabetes patients was having Sedentary lifestyle with stressful work.

- *Jāṁgala deśa*: Maximum no. of diabetes patients was having Sedentary lifestyle with job stress and *Avyāyāma, Ālasya.*

Upashaya (Therapy):

- According to *Deśa* various type of therapy (Drug regimen) used to control the diabetes.

- Easy source and availability of drugs plays important role while selecting drug and protocol of therapy for the disease.(e.g.- *Nilakaṁṭhi & Tejapatra* used in Paprola, Gudam*ā*ra & *Māmejavā used in Jamnagar , Asānadi* kwātha used in Udupi, *Ṛsyagandhā / Panīra kā phula used in* Varanasi, *Guduci & Neem*a used in Nagpur and *Madhumehāri Curṇa used in Jaipur*)

- When treating diabetes patients in *Ānūpa Deśa*, there is need to give *Śodhana* therapy like *Vamana* and *Virecana* before administration of any *Śamana* drug therapy. *Rasāyana* therapy is important for prevention of further complications of Diabetes.

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