IAMJ

INTERNATIONAL AYURVEDIC MEDICAL JOURNAL

Review Article ISSN: 2320-5091 Impact Factor: 6.719

CONCEPTUAL STUDY ON TYPE 2 DIABETES MELLITUS W.S.R TO PRAMEHA

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https://doi.org/10.46607/iamj2111012023

(Published Online: January 2023)

Open Access
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Article Received: 30/12/2022 - **Peer Reviewed:** 13/01/2023 - **Accepted for Publication:** 20/01/2023.

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ABSTRACT

Type 2 diabetes mellitus is a clinical syndrome characterized by hyperglycemia caused by resistance to the actions of insulin in liver and muscles together with impaired pancreatic beta cell function. Polyuria, hyperphagia, excess thirst, weight loss are the common symptoms seen. Genetic predisposition and environmental factors like diet and sedentary lifestyle plays vital role in progression of the disease and development of complications. Diabetic ketoacidosis, hypoglycemia are acute complications while atherosclerosis, diabetic microangiopathy, neuropathy, nephropathy and retinopathy are chronic complications. *Prameha roga(*diabetes*)* in Ayurveda is characterized by increased quantity of turbid urine. The word *Prameha* literally means to flow. According to *Caraka*, *Prameha* is ranking first among the disease that show chronicity and is included under 8 *Maharogas*(major diseases).

Keywords: Diabetes mellitus , *Prameha*

INTRODUCTION

Diabetes mellitus is a metabolic disorder of multiple etiology, characterized by chronic hyperglycemia with disturbances of carbohydrate, fat and protein metabolism resulting from defects in insulin secretion, insulin action, or both. The main etiological classifications of diabetes are type 1 diabetes mellitus, type 2 diabetes mellitus, gestational diabetes mellitus. Type 1 diabetes mellitus is an autoimmune

disease. Type 2 diabetes mellitus, earlier known as non-insulin dependent diabetes mellitus is caused either by a delayed insulin secretion relative to glucose load (impaired insulin secretion) or the peripheral tissues are unable to respond to insulin (insulin resistance). Type 2 diabetes mellitus is clinically manifested by the cardinal symptoms of polyphagia, polydipsia, polyuria and weight loss. The major complications of diabetes mellitus may be acute metabolic or chronic systemic. These are diabetic ketoacidosis, diabetic microangiopathy, diabetic nephropathy, diabetic retinopathy, diabetic neuropathy, infections, hyperosmolar hyperglycemic nonketotic coma and hypoglycemia. Criteria for diagnosis of diabetes mellitus are- Fasting blood sugar- >125mg/dl, Post prandial blood sugar- >199mg/dl, Random blood sugar- >150mg/dl, and HbA1c- >6.4% . Ayurveda mentions *Prameha* as one among *Ashtamahagadas(*8 major diseases). 20 types of *Prameha* are listed. *Brihattrayies*(major triad of Ayurvedic preceptors) elaborate the causative factors, pathogenesis, prodromal symptoms, clinical manifestations, variations in urine analysis, complications and prognosis and treatment of *Prameha*

AIM AND OBJECTIVE: To review the concept of *Prameha* from different Ayurvedic texts.

MATERIAL AND METHODS: Study of ayurvedic classics, journals, Research papers published in both ayurvedic as well as modern medicine was done and is presented here.

REVIEW OF LITERATURE: Diabetes mellitus refers to a group of metabolic disorders that features hyperglycemia. It is due to absolute or relative deficiency of insulin[1]. The metabolic disturbances associated with the disease causes several abnormalities in multiple organ systems and impose a huge burden on the health care system.

CLASSIFICATION[2]

I. Type 1 diabetes (β-cell destruction, usually leading to absolute insulin deficiency)
II. Type 2 diabetes (may range from predominantly insulin resistance with relative insulin deficiency to a predominantly secretory defect with insulin resistance)
III. Other specific types
IV. Gestational diabetes mellitus

ETIOLOGY AND PATHOGENESIS[3]

In both of the common types of diabetes, environmental factors interact with genetic susceptibility. Type 2 diabetes is a more complex condition than type1 diabetes because there is a combination of resistance to the actions of insulin in liver and muscle together with impaired pancreatic **β**cell function leading to relative insulin deficiency. Causes can be stated as-

1. Insulin resistance
2. Pancreatic βcell failure
3. Genetic Predisposition
4. Environmental factors
5. Other risk factors such as age, pregnancy

CLINICAL FEATURES[4]

Clinical manifestations are similar in both types of diabetes. In type 1 they develop acutely. In type 2 the onset is insidious. Type 1 patients are usually below the age of 30. They are thin and emaciated. Type2 patients are over the age of 30, obese, often asymptomatic and may present with vascular complications of diabetes. Classical symptoms include polyuria, polydipsia, polyphagia and weight loss. Other presentations include non-healing ulcers, recurrent respiratory or urinary tract infections, rapid changes in refraction of eye, increased tendency for fungal infections and vague ill health. Diabetics also present with steady and unexplained rapid weight loss, unexplained peripheral neuropathy and premature cataract and retinopathy.

COMPLICATIONS[5]

Acute Complications- Diabetic ketoacidosis (DKA) and hyperglycemic hyperosmolar state (HHS). Chronic complications- These are divided into vascular and non-vascular complications. Vascular complications are subdivided into microvascular (retinopathy, neuropathy, nephropathy) and macrovascular complications (coronary heart disease, peripheral arterial disease, cerebrovascular disease). Non vascular complications include problems such as gastroparesis, infections, and skin changes.

INVESTIGATIONS[6] Urine Testing- To detect Glucose Ketones and Protein(albumin). Blood Testing- Glucose- Fasting, post prandial and random blood sugar. Glycated Hemoglobin(HbA_{1c})

PRAMEHA- AN AYURVEDIC VIEW

Prameha roga in Ayurveda is characterized by increased quantity of turbid urine.

NIRUKTI

Prameha is derived from "*Pra*" and "*miha*". *Pra* denotes excessive quantity and frequency. *Miha* means, "*Sinchane*" – to moisten, "*Ksharane*"- to flow, "Prasava"- to flow excessively.

DEFINITIONS

"Prakarshena adhikyena mehati iti"- means passage of excess of urine.

NIDANA OF PRAMEHA – *Nidana*(causative factor) refers to etiological factor of a disease.

SAMANYA NIDANA – *Samanya*(common) *nidana* of *Prameha* are those causative factors which cause *kapha*(phlegm) *vridhi*(aggravation) and vitiation of *medodhatu*(adipose tissue). Vagbhata(Ayurvedic preceptor) in *Ashtanga Hridaya*(Ayurvedic treatise) mentions that increase of *medo*, *mutra*(urine), and *kapha* is the chief cause.[7]. Food items having sweet, sour and salty taste, foods that are fatty, not easily digestible, slimy and cold, fresh grains, beer, meat of animals of marshy regions, juice of sugarcane, molasses, milk, habit of sitting constantly at a place, sleeping without adopting proper regimens all contribute to manifestation of *Prameha*. *Swadvamla pradhana*(sweet and sour dominant) food produce *Srishtavinmutrata*(excess faeces and urine). Sugarcane juice is *Kapha mutra krit*(generating). Excess use of sweets leads to *Sthoulya* and *Meha*. "*Asya sukham*"-habit of sitting idle is *Shleshma meda soukumaryakrit* (generates plumpiness) . All these leads to *Kapha medo vridhi*. *Acarya Caraka*(Ayurvedic preceptor) comes to conclusion that etiological factors of *Prameha* are "*Kaphakrit ca sarvam*(everything generates phlem)". When the etiological factors have properties homologous with *Doshas*(humours) and or *Dhatus*(tissues) or *Doshas* have properties homologous with *Dhatus*, this leads to manifestation or aggravation of the disease.[8]

VISHESHA NIDANA

Kaphaja Prameha

1. Excessive and frequent intake of *Hayanaka*(a type of rice), *Yavaka*(a type of barley) etc which are *Madhura*, *Snigdha*(unctuous), *Amla* in *Paka*(metabolism) *and Srishta mootra pureesha*(generates urine and faeces).
2. Intake of *Shimbi dhanyas*(pulses) *like Harenu*(pea), *Masha*(black gram) with ghee. Also, use of *Abhishyandi*(having heavy and slimy attributes) food like *Navadhanya*(new cereals).
3. Intake of meat of domesticated, marshy and aquatic animals.
4. Intake of vegetables, *Tila*(sesame), *Pishtanna*(food prepared of rice), *Payasa*(porridge), *Krisara*(dish of rice and sesame), *Vilepi*(rice gruel) and products of sugarcane.
5. Intake of milk, fresh wine, immature curd and curd which are liquid and sweet.
6. Avoidance of physical exercise.
7. Indulgence in sleep, bed rest and sedentary habit.
8. Indulgence in regimens which are *Kapha*, *Meda*, and *Mutra vardhana*.

Paithika Prameha

1. Intake of hot sour, saline, alkaline and pungent food.
2. Intake of food before the previous meal gets digested.
3. Exposure to heat of sun, fire, physical exertion and anger.
4. Intake of mutually contradictory foods.

Vatika Prameha

1. Excessive intake of pungent, bitter, astringent, rough, light and cold things.
2. Excessive indulgence in sex and physical exercise.
3. Excessive administration of emesis, purgation, enema of the *Asthapana*(decoction enema) type and *Sirovirechana*(nasal purgation).
4. Suppression of manifested urges, fasting, assault, exposure to sun, anxiety, grief, excessive bloodletting, keeping awake at night and irregular posture of the body.

BHEDA (Classification of Prameha)

1. According to *Dosha* dominance a. *Kaphaja* b. *Paithika* c. *Vatika*	2. According to body constitution ***a.*** *Sthoola*(obese) b. *Krisha*(lean)
3. According to *nidana* a. *Sahaja*(innate) b. *Apathyanimittaja*(due to unwholesome usage) a. *Santarpanajanya*(due to over nourishment) b. *Apatarpana-janya*(due to deficiency)	4. According to pathology *a. Avaranajanya*(due to obstruction) b. *Dhatukshayajanya*(due to emaciation)

The *Brihattrayis* classify *Prameha* mainly into three groups namely *Vatika*, *Paithika* and *Kaphaja*, even though the involvement of *Tridoshas* is seen in all the three types.

KAPHAJA PRAMEHA- 10 IN NUMBER [9,10,11]

Prameha	Vagbhata	Susruta	Charaka
Udakameha	Present	Present	Present
Ikshumeha	Present	Present	Present
Sikatameha	Present	Present	Present
Sanairmeha	Present	Present	Present
Sandrameha	Present	Present	Present
Sukrameha	Present	Present	Present
Sandraprasadmeha	-	-	Present
Pishtameha	Present	Present	-
Seetameha	Present	-	Present
Lalameha	Present	-	Alalameha
Surameha	Present	present	Present
Lavanameha	-	present	-
Phenameha	-	present	-

PAITHIKA PRAMEHA- 6 IN NUMBER [12,13,14]

Prameha	Vagbhata	Susruta	Caraka
Ksharameha	Present	Present	Present
Kalameha	Present	-	Present
Neelameha	Present	Present	Present
Raktameha	Present	Shonitameha	Lohitameha
Manjishtameha	Present	present	Present
Haridrameha	Present	present	Present
Amlameha	-	present	-

VATIKA PRAMEHA- 4 IN NUMBER [15,16,17]

Prameha	Vagbhata	Susruta	Caraka
Vasameha	Present	present	Present
Majja meha	Present	-	Present
Hastimeha	Present	present	Present
Madhumeha	Present	Kshoudrameha	Present
Sarpirmeha	-	present	-

SAMPRAPTHI OF MADHUMEHA[18] Due to the *Nidana sevana, Kapha*, *Pitha*, *Mamsa*(muscle fibres), *Meda* etc gets vitiated excessively. These *Vridha Doshas* and *Dhatus* produce *Avarana(*obstruction) to the movement of *Vayu*. This *Vayu* along with *Ojas*(essence of dhatus) reach *Vasti*(urinary bladder) and produce *Madhume-ha*(diabetes mellitus) which is *Krichra sadhya*(difficult to cure). This *Madhumeha* shows features of *Vata*, *Pitha* and *Kapha* alternatingly.

POORVARUPA [19,20,21,22]

They appear in *Sthanasamsraya Kriyakala*(localisation stage) of the disease. Different *Poorvarupas*(prodromal symptoms) mentioned by various *Acharyas* have been tabulated below.

POORVARUPA	CARA-KA	SUSRUTA	VRIDHA VAGBHATA	VAGBHATA	MADHAVA
Keseshu jatileebhava(matting of hair)	+	+	+	-	-
Asya madhurya(sweetness of mouth)	+	-	+	+	+
Karapada daha(burning of hands and feet)	+	+	+	+	+
Karapada suptata(numbness of hands and feet)	+	-	+	+	-
Pipasa(thirst)	+	+	+	-	+
Alasya(lassitude)	+	-	+	-	-
Kaya malam(body toxins)	+	-	+	-	-
Kaya chidresu upadeha(coating of orifices)	+	-	+	-	-
Angesu paridaha(Burning sensation of body)	+	-	-	-	-
Suptata angesu(numbness of body)	+	-	+	--	
Shatpadapipeelikadimutrabhisara-nam(crawling of insects in urine)	+	-	+	+	-
Visra sareera gandha(body odour similar to that of blood)	+	+	+	+	-
Sarvakala Nidra (excess sleep)	+	-	+	-	-
Sarvakala tandra(excess of lassitude)	+	+	+	-	-
Sweda(sweating)	+	-	+	+	-
Shithilangata(looseness of body)	+	-	-	+	-
Sayyasana swapneshu sukhe rati(liking for sedentary state)	+	-	-	+	-
Hrit netra jihva sravanopadeha(coating of heart, eyes and tongue)	+	-	-	+	-
Ghanangata(heaviness of body)	+	-	-	+	-
Kesa nakha ativridhi(overgrowth of hairs and nails)	+	+	-	+	-
Seetapriyata(liking for cold)	+	-	+	+	-
Snigdhagatrata(unctuousness of body)	-	+	+	-	-
Pichila gatrata(sliminess of body)	-	+	-	-	-
Guru gatrata(heaviness)	-	+	-	-	-
Madhura mutrata(sweetness of urine)	-	+	-	-	-
Sukla mutrata(whiteness of urine)	-	+	+	-	-
Sada(tiredness)	-	+	-	-	-
Swasa durgandhata(halitosis)	-	+	+	-	-
Deha chikkanata(coating of body)	-	-	-	-	+
Dantadeenam maladhyatvam(accumulation of dirt on teeth etc)	-	-	-	-	+
Gala shosha(dryness of throat)	-	-	+	+	-
Talu shosha(dryness of palate)	-	-	+	+	-

RUPA

No systemic signs and symptoms have been mentioned in classics as *Rupa*(symptoms) of *Prameha*. Only the characteristics of *Mutra* is mentioned as feature of *Prameha*. *Samanya rupa* mentioned in classics is "*Prabhuta mutrata*(excess urine)" and "*Avila mutrata*(turbid urine)"[23]. In *Nyaya chandrika* it is mentioned that" *Prabhootatwam*" is *Dushyanam dravairekeebhutatvat mutra prabhutatvam*(excess urine due to liquifying of tissues). *"Avilatvam*" is "*Mutrasya pramehadushyanam medoraktamamsa-*

majjasukraudakavasalaseekojasam kwachideva pramehekasyajitheva dushyasya avayava mishree-bhavatvat(urine gets mixed with the tissues causing diabetes like adipose, blood,muscle,marrow,lymph, essnce of all tissues)". *Vishesha*(specific) *rupa* is the characteristic features of urine of 20 types of *Prameha*.

UPADRAVA(COMPLICATIONS)- Refers to diseases that supervenes the main disease. They can be considered as *Samanya upadrava* and *Visesa upadrava*. *Vagbhata* classified *Upadravas* according to *dosha* dominance.

Samanya upadrava- *Caraka* didn't classify *Upadrava* as per *dosha* but mentioned diseases- *Atisara*(diarrhoea), *Jwara*(fever), *Daha*(burning sensation), *Dourbalya*(tiredness), *Arocaka*(tastlessness), *Avipaka*(indigestion), *Pootimamsa*(putrefaction), *Pidaka*(carbuncles), *Vidradhi*(abscess) as *Upadravas*[24]

Visesha Upadrava[25,26,27]

Kaphaja	Pithaja	Vataja
Avipaka(indigestion)	Vasti toda(pain in urinary bladder)	Udavarta(bloating)
Aruchi(tastlessness)	Mehana toda(pain in penis)	Hritgraha(stiffness in cardiac region)
Chardhi(vomiting)	Mushkavadarana(cracking of scrotum)	Loulya(greed)
Nidra(sleep)	Jwara(fever)	Sula(pain)
Kasa(cough)	Daha	Anidra
Peenasa(rhinitis)	Anidra(sleeplessness)	Sosha(emaciation)
Makshikopasarpanam(crawling of insects)	Murcha(unconciosness)	Kasa
Alasyam(lassitude)	Hritsula(pain in cardiac region)	Swasa
Saitya(chills)	Arocaka	Sthambha(stiffness)
Kapha praseka(watering)	Vamathu(vomiting)	Kampa(tremor)
Swasa(dyspnoea)	Paridhupana(burning sensation)	Badhapureesa(hard stools)
	Nidranasha(loss of sleep)	
	Pandu(pallor)	
	Vidbheda(loose stools)	

Prameha pidakas occur if the disease *Prameha* is left untreated. *Pidakas* according to various *Acaryas* are-[28,29,30]

PIDAKA	VAGBHATA	SUSRUTA	CARAKA
Saravika	+	+	+
Kachapika	+	+	+
Sarshapika	+	+	+
Jalini	+	+	+
Vinatha	+	+	+
Alaji	+	+	+
Vidradhi	+	+	+
Putrini	+	+	-
Masoorika	+	+	-
Vidarika	+	+	-

Upadravas of Pidaka- Complications of *Pidakas* are thirst, dyspnoea, sloughing, unconsciousness, hiccup, toxemia, fever, cellulitis and impaired function of vital organs[31]

DISCUSSION

Diabetes mellitus is a clinical syndrome characterised by hyperglycemia caused by absolute or relative deficiency of insulin. Hyperglycemia has many causes but is most commonly due to type 1 or type 2 diabetes. Lack of insulin affects the metabolism of carbohydrates, protein and fat and can cause significant disturbance of water and electrolyte homeostasis. Death may result from acute metabolic decompensation. Type1 diabetes is associated with profound insulin deficiency requiring replacement ther-

apy. Type2 diabetes patients retain the capacity to secrete some insulin but exhibit impaired sensitivity to insulin (insulin resistance) and initially can usually be treated without insulin replacement therapy. As *Prameh*a as one among the *Asthamahagadas,* it is proved that it is a multisystem, multifactorial chronic metabolic disorder which if neglected can lead to grave complications. It is also a *Marmaja vyadhi*(disease of vital points) as the *Marma Vasti* plays an important role in the pathogenesis of the disease. *Acharya*s describe *Pramehas* as the *Agrya*(supreme) among *Anushangi rogas*. i.e persist for long duration. Also, the disease is characterised by *Ojonasha*(loss of vigour) in the later stages and presents with severe *Dhatukshaya*. Symptoms of hyperglycemia are thirst, dry mouth, polyuria, nocturia, tiredness, fatigue, lethargy noticeable change in weight (usually weight loss), blurring of vision, pruritus vulvae, balanitis, nausea, headache, hyperphagia, predilection for sweet foods, mood change, irritability, difficulty in concentrating and apathy. In Ayurveda the disease *Prameha* is named after its clinical presentation of excess of urination. In *Prameha* it is seen that even the later stages of the disease show some of the *Purvarupas*.

Pathogenesis of Type 2 Diabetes mellitus can be explained under the headings –

1. Genetic factors
2. Constitutional factors such as obesity, hypertension, and level of physical activity
3. Insulin resistance
4. Impaired insulin secretion
5. Increased hepatic glucose synthesis

Incorporation of pathogenesis of Type2 DM in Samprapthi(etiopathogenesis) of Prameha

Samprapthi of *Prameha* can be mentioned in three stages.

Stage 1- Stage of Kapha prakopa(vitiation)*:* In the first stage insulin cannot bind with membrane receptor proteins in the peripheral tissues, probably due to *Bahu drava kapha*(liquified phlegm). This decreases the binding property of *Kapha*. The levels of intracellular triglycerides are markedly increased in muscles and liver tissue, presumably because excess circulating free fatty acids are deposited in these organs. Intracellular triglycerides and products of fatty acid metabolism are potent inhibitors of insulin signaling and result in an acquired insulin resistance state. Because of *Medodhatvagni mandya*(diminition of fire in adipose tissue), there may be *Medo dhatu vridhi* with excess of *Kitta bhaga*(wastes) than *Saramsa*(essence). This forms a *Srotorodha*(obstruction of channels) in the form of *Sanga*(obstruction) in the *Medovaha Srotas* and also the quality of *Medas* become *Bahu*(more in quantity) and *Abadha*(unformed). This becomes *Vimarga gami*(moving in improper channels) and reaches *Rakta* leading to defect in insulin signaling cascade. This leads to defective *Dhatu Poshana*(tissue nourishment). Also, there is a tendency to deplete intra cellular water which mainly occur in the *Rasavaha Srotas*(channels carrying chyle) causing a *Kleda atiprasanga*(aggravation of moisture content) and *Amavastha*(unripe state) in *Rakta*.

Stage 2- Stage of Pitha Prakopa*:* Pro inflammatory cytokines that are secreted in response to excess nutrients such as free fatty acids result in both peripheral resistance and beta cell dysfunction. They act on major sites of insulin action to promote the insulin resistance. Also, the long term demands of peripheral insulin resistance is compensated by increased secretion of insulin by beta cells. This produces beta cell dysfunction leading to failure of beta cell adaptation. In this stage already released pro inflammatory cytokines, hyperinsulinaemia, lipotoxicity and glucotoxicity make a *Pitha Prakopavastha.*

Stage 3- Stage of vata prakopa*:* In this stage there is qualitative and quantitative beta cell dysfunction. Qualitatively there is loss in the normal pulsatile, oscillating pattern of insulin secretion.

CONCLUSION

Diabetes mellitus is a group of metabolic disorders that features hyperglycemia due to absolute or relative deficiency of insulin. The etiological classification of diabetes mellitus has two main types of diabetes mellitus labelled as type1 and type 2 along with gestational diabetes mellitus and the other spe-

cific types. Insulin resistance, pancreatic βcell failure, genetic predisposition, environmental factors play important role in pathogenesis of type2 diabetes mellitus. Classical symptoms include polyuria, polydipsia, polyphagia and weight loss. Diabetic ketoacidosis (DKA) and hyperglycaemic hyperosmolar state (HHS) are acute complications of diabetes. Microvascular complications (retinopathy, neuropathy, nephropathy), macrovascular complications (coronary heart disease, peripheral arterial disease, cerebrovascular disease)and non-vascular complications like gastroparesis, infections, and skin changes constitute chronic complications. *Prameha* is *Agrya* among *Anushangi rogas*. It is characterised by *Prabhoota avila mutrata*. It is one among the *Ashtamahagadas.* Intake of *Medomutrakapha vardhana* and *Swaduamlarasapradhana ahara* leads to *Prameha*. The three types of *Prameha* based on *doshas* are *Kaphaja, Paitika* and *Vatika* and as the disease progresses it attains *Vatika Dosha* dominance. Even though *Prameha* starts due to *Avarana*, it undergoes *Dhatukshaya* as it becomes chronic. The pathogenesis of diabetes mellitus can be incorporated with the three stages of *Prameha* (*Kaphaja*, *Paitika* and *Vatika*). The stage of insulin resistance, then along with the role of inflammation there is lipotoxic and hyper insulinemic and finally the beta cell destruction. In the stage of *Dhatukshaya* there is *Ojo Nasha* leading to *Agnisadana*, and development of *Upadravas*.

REFERENCES

1. Frier BM, Fisher M. Diabetes mellitus, In: Colledge NR, Walker BR, Ralston SH(Eds)Davidson's Principles and Practice of Medicine. 21 ed. Edinburgh: Churchill Livingstone Publishing;2010.p 806
2. Carolina Solis Herrera, Curtis Triplitt, Charles Reasner, et al. Classification of diabetes mellitus www.ncbi.nlm.nih.gov Endocrinology textbook. Published online 2018 February 24 http://www.endotext.org last accessed on 12/7/20
3. Harsh Mohan. Diabetes mellitus Textbook of Pathology. 7th ed. New Delhi: Jaypee Publishers;2017.p808
4. Harsh Mohan. Diabetes mellitus Textbook of Pathology. 7th ed. New Delhi: Jaypee Publishers;2017.p810
5. Frier BM, Fisher M. Diabetes mellitus, In: Colledge NR, Walker BR, Ralston SH(Eds)Davidson's Principles and Practise of Medicine. 21 ed. Edinburgh: Churchill Livingstone Publishing;2010.p 802
6. Harsh Mohan. Diabetes mellitus. Textbook of Pathology. 7th ed. New Delhi: Jaypee Publishers;2017.p813
7. Vagbhata. Pramehanidanam. Pan Sreetaradattapant, Ashtanga Hrudayam nidanastanam.5th edition. Varanasi: Chowkambha Krishnadas Academy; 2001 ; p 321 sloka 1
8. Agnivesa. Pramehanidanam. Dr. Ram Karan Sharma, Vaidya Bhagvan Dash. Charaka Samhita nidanasthana. reprint edition. Varanasi: Choukamba Sanskrit Series Office; 2013; p 53, Sloka 4
9. Vagbhata. Pramehanidanam. Pan Sreetaradattapant, Ashtanga Hrudayam nidanastanam.5th edition. Varanasi: Chowkambha Krishnadas Academy; 2001 ; p 323 sloka 8-13
10. Susruta. Pramehanidanam. Kaviraj Kunjalal . Susruta samhita Nidanasthanam volume II. Varanasi. Chowkhamba orientalia. 1998. p 50. Sloka 6.
11. Agnivesa. Pramehanidanam. Dr. Ram Karan Sharma, Vaidya Bhagvan Dash. Charaka Samhita nidanasthana. reprint edition. Varanasi: Choukamba Sanskrit Series Office; 2013; p57, Sloka 10
12. Vagbhata. Pramehanidanam. Pan Sreetaradattapant, Ashtanga Hrudayam nidanastanam.5th edition. Varanasi: Chowkambha Krishnadas Academy; 2001 ; p 324 sloka14-15
13. Susruta. Pramehanidanam. Kaviraj Kunjulal . Susruta samhita nidan sthanam volume II. Varanasi. Chowkhamba orientalia. 1998. p 50.Sloka 7.
14. Agnivesa. Pramehanidanam. Dr. Ram Karan Sharma, Vaidya Bhagvan Dash. Charaka Samhita nidanasthana. reprint edition. Varanasi: Choukamba Sanskrit Series Office; 2013; p 60, Sloka 24
15. Vagbhata. Pramehanidanam. Pan Sreetaradattapant, Ashtanga Hrudayam nidanastanam.5th edition. Varanasi: Chowkambha Krishnadas Academy; 2001 ; p 324 sloka16-19
16. Susruta. Pramehanidanam. Kaviraj Kunjulal . Susruta samhita Nidanasthanam volume II. Varanasi. Chowkhamba orientalia. 1998. p 51. Sloka 8.
17. Agnivesa. Pramehanidanam. Dr. Ram Karan Sharma, Vaidya Bhagvan Dash. Charaka Samhita nidanasthana. reprint edition. Varanasi: Choukamba Sanskrit Series Office; 2013; p 63,64, Sloka 40-44
18. Vagbhata. Pramehanidanam. Pan Sreetaradattapant, Ashtanga Hrudayam nidanastanam.5th edition. Varanasi: Chowkambha Krishnadas Academy; 2001 ; p 324 sloka19-20
19. Vagbhata. Pramehanidanam. Pan Sreetaradattapant, Ashtanga Hrudayam nidanastanam.5th edition. Varanasi: Chowkambha Krishnadas Academy; 2001 ; p 326 sloka 38,39
20. Susruta. Pramehanidanam. Kaviraj Kunjulal . Susruta samhita Nidanasthanam volume II. Varanasi. Chowkhamba orientalia. 1998. p 49 Sloka 4.

21. Agnivesa. Pramehanidanam. Dr. Ram Karan Sharma, Vaidya Bhagvan Dash. Charaka Samhita nidanasthana. reprint edition. Varanasi: Choukamba Sanskrit Series Office; 2013; p 65, Sloka 47
22. Madhavakara. prameha pidaka Nidanam. Prof K R Srikanta Murthy, Madhava Nidanam. reprint edition. Varanasi: Choukamba Sanskrit Series Office; 2013; p 117, Sloka 5
23. Susruta. Pramehanidanam. Kaviraj Kunjulal . Susruta samhita Nidanasthanam volume II. Varanasi. Chowkhamba orientalia. 1998. p 50 Sloka5.
24. Agnivesa. Pramehanidanam. Dr. Ram Karan Sharma, Vaidya Bhagvan Dash. Charaka Samhita nidanasthana. reprint edition. Varanasi: Choukamba Sanskrit Series Office; 2013; p 65, Sloka 48
25. Madhavakara. prameha Pidaka Nidanam. Prof K R Srikanta Murthy, Madhava Nidanam. reprint edition. Varanasi: Choukamba Sanskrit Series Office; 2013; p 118, Sloka18,19,20
26. Susruta. Pramehanidanam. Kaviraj Kunjulal . Susruta samhita Nidanasthanam volume II. Varanasi. Chowkhamba orientalia. 1998. p 50 Sloka 5.
27. Vagbhata. Prameha Nidanam. Pan Sreetaradattapant, Ashtanga Hrudayam nidanastanam.5th edition. Varanasi: Chowkambha Krishnadas Academy; 2001 ; p 325 sloka 22,23,24
28. Vagbhata. Pramehanidanam. Pan Sreetaradattapant, Ashtanga Hrudayam nidanastanam.5th edition. Varanasi: Chowkambha Krishnadas Academy; 2001 ; p 325 sloka 25-35
29. Susruta. Pramehanidanam. Kaviraj Kunjulal . Susruta samhita Nidanasthanam volume II. Varanasi. Chowkhamba orientalia. 1998. p 53 Sloka 14.
30. Agnivesa. Kiyanta shiraseeyam. Acharya PV Sharma. Charaka Samhita sutrasthana. 2nd edition. Varanasi: Choukamba Sanskrit Series Office; 2012; p 99, Sloka 83
31. Agnivesa. Kiyanta shiraseeyam. Acharya PV Sharma. Charaka Samhita sutrasthana. 2nd edition. Varanasi: Choukamba Sanskrit Series Office; 2012; p 101, Sloka 111

Source of Support: Nil
Conflict of Interest: None Declared

How to cite this URL: Divya K & Farseena K: Conceptual Study on Type 2 Diabetes Mellitus W.S.R to Prameha. International Ayurvedic Medical Journal {online} 2023 {cited January 2023} Available from: http://www.iamj.in/posts/images/upload/142_150.pdf