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DIETARY MANAGEMENT FOR PRE TYPE 2 DIABETES

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ABSTRACT

No gift can surpass the gift of healthy life. *Ahara , Nidra* and *Brahma Charya are* the par excellent components that living being need. Diet means combination of good nutrient which helps to maintain a quality healthy life. Type 2 diabetes is a long term metabolic disorder that is characterized by high blood sugar, insulin resistance, and relative lack of insulin. Main cause of this disorder is the lifestyle changes and hence is partly preventable by maintaining a normal weight, exercising regularly, and eating properly. With preventive aim of pre Diabetic by *Ayurvedic* dietary plan, data was collected by reviewing *Ayurvedic* text along with review of, traditional text, modern text, and internet search. After reviewing all the gathered details, three sets of *Ayurvedic* diet have been planned .It can be concluded that preventive aspect of type 2 Diabetes can be achieved by consuming appropriate diet as per *Ayurvedic* dietary principle and can be adopted as preventive approach of type 2 Diabetes.

Keywords: *Ayurveda*, Calories, Diet, Pre Diabetic Stage

INTRODUCTION

Diabetes has become a major cause of death for people under the age of 60. Globally, 382 million adults (8.3%) are living with diabetes and the estimate is projected to rise over 592 million by 2035.The entire *Ayurveda* is frame on *Hetu*/etiology, *Linga/* symtomatology and *Aushada*, medicament which can be applied for both health and disease state. The changing life style; lack of exercise[1], fast foods, sedentary lifestyle, and stress are major reasons for increasing burden of non communicable diseases or aggravating the existing condition. As a main etiology of Type 2 Diabetes, dietary modification plays a major role. After urbanization and economic development, many countries have experienced with life style

changes including dietary changes. *Ayurveda* has also clearly mentioned the role of unhealthy dietetic pattern[2] and unhealthy behavioral pattern in the pathophysiology of disease *Madhumeha* which can be correlated with type 2 Diabetes. In addition, a low-fiber diet with a high glycemic index has been associated with an increased risk of diabetes and specific dietary fatty acids may differentially affect insulin resistance. A common statement and one of the main objects of *Ayurveda* science, *"Swasthasya Swasthya Rakshanam"* can be practically applied as the management of pre stage of type 2 Diabetes. Pre stage of Diabetes Mellitus can be diagnosed for a patient with blood sugar level, FBS- 110 to 126 mg/dl or PPBS- 140 to 200mg/dl. If the individuals are careless about their diet, obviously prone to convert as type 2 Diabetes. Hence, diet is the key for the prevention and management of type two diabetes patients in this stage.

Aim and Objectives

To establish set of diet considering Age, Body Mass Index, and Working Pattern of pre stage of Type 2 Diabetes as per *Ayurveda*.

Methodology

Data were collected by reviewing *Ayurvedic* classical texts, traditional books, modern medical books and internet search. Reviewing all the gathered details, three sets of *Ayurvedic* diet have been planned to prevent type 2 Diabetes by considering *Ayurvedic* concept with modern correlation.

Observations and Results

The composition of diet is one of the best known dietary patterns for its beneficial effects on human health that may act beneficially against the development of type-2 diabetes. Considering all above details, three sets of *Ayurvedic* diet were planned. Table no 1, 2 and 3 show that they are consisting 1358, 1197, and 1602 Calories (Kcal) including requirement amount of macro (Carbohydrates, Fats, Fiber, Proteins, and Water) and micro nutrients (minerals and vitamins) are for normal body weight, over and low weight with moderately active life style persons. These are not fixed. People should consume diet around these because their digestive mechanism is not properly worked.

Diet for any state whatever health or disease is planned on the basis of property/quality of diet article and its caloric condition .This factor are further influenced by *Prakriti, Vaya, Kala, Agni* and *Vyayama* of the individual.

Table 1, 2, 3: Diet chart for the Pre Type 2 DM patients [3]

Table No 1 Set of Diet for a Person Who is in Pre Diabetes Stage with normal Body Weight and moderately Active Life Style	Table No 2 Set of Diet for a Person Who is in Pre Diabetes Stage with Low Weight and moderately active Life Style	Table No 3 Set of Diet for a Person Who is in Pre Diabetes Stage with Overweight and moderately active Life Style

Food Item	Amount	Calories (kcal)	Amount	Calories (kcal)	Amount	Calories (kcal)
EARLY MORNING (5.30am)			EARLY MORNING (5.30am)		EARLY MORNING (5.30am)	
Water Herbal gruel (*Aegle marmelos, Cassia auriculata ,Centella asiatica ,Costus speciosus, Murraya koenigii, Passiflora edulis)*[4] Method of preparation of Herbal gruel First, salt gruel is prepared (To prepare the dish, rice is boiled in a plenty of water until it softens significantly. Salt is added during boiling the rice). Then salt gruel is mixed with herbal juice and stirrer well. Later, mixture is kept until herbal juice is boiled a few minutes.(Less amount of salt should be added here) *Yava mantha* (*Hordeum vulgare*)[5] Method of preparation: soak 2 to 3 tea spoon of powdered roasted *Yava in a* glass of warm water for half an hour and then churn this liquid, filter and drink	1Glass	- 324	1glass 1/2Cup	- 162	1glass 1/2 Cup	- 162
BREAKFAST (7.30am)			BREAKFAST (7.30am)		BREAKFAST (7.30am)	
Steamed Green Gram(*Vigna radiate*) (Coconut 2 tea spoon) 1- 2 dry rotti made from *Yava/barely* (*Hordeum vulgare* L.) or 1 bowl of boiled green gram or splitted Bengal gram with slight rock salt, turmeric and pepper	5 Table spoon	120/130+ 41.5	7Table spoon	120/130+ 41.5	4Table spoon	130+41.5
MID MORNING(10.00am)			MID MORNING (10.00am)		MID MORNING (10.00am)	
Punica granatum juice	100g	69	100g	69	10g	148
Green Gram(*Vigna radiate*) Boiled Water	20g	25	20g	25	20g	25
LUNCH(12.30pm)			LUNCH(12.30pm)		LUNCH(12.30pm)	
Rice(*Oryza sativa*)(Red rice with husk) (Type of special traditional rice such as *Kalu heenati,Meneri,Olu,Suwadel,Ratdel*)	2 Cups (100g)	387	3 Cups (150g)	580.5	1Cups(50g)	193
Dhal curry/*Masura* (*Lens culinaris*)	3 Table spoon (45g)	130	3 Table spoon (45g)	130	2Table spoon (30g)	86.66
Fish piece (Salmon/ Trout /Herring /Albacore /tuna /Mackerel/ Halibut /Sardines)	60g	67.2	60g	67.2	60g	67.2

Green leaves Salad(Methi leaves (*fenugreek* leaves), Curry leaves(*Murraya Koenigii*) Cabbage(*Brasica oleracea*), Cucumber(*Parastichopus californicus*), Radish (*Raphanus raphanistrum*)(with rock salt & black pepper powder)	10g	1.4	10g	1.4	10g	1.4
Vegetable Curry – Cucumber(*Parastichopus californicus*), Beans(*Phaseolus vulgaris*), Raddish (*Raphanus raphanistrum*) Cabbage(*Brasica oleracea*), Bitter guard(*Momordica charantia*), Snake guard (*Trichosanthes* cucumerina), Mushroom(*Basidiomycota Agaricomycetes*), Drumstick(Moringa oleifera), Pumpkin *(Cucurbita pepo),* Amla(*Phyllanthus emblica* (gooseberry).	7Table Spoon (105g)	150	7Table Spoon (105g)	150	8 ½ Table Spoon (105g)	182
Mussa spp (*Musa balbisiana*)	100g	92.75	100g	92.75g	20	42.5
EVENING(4.00pm)			EVENING (4.00pm)		EVENING (4.00pm)	
Green tea / Herbal tea 1 glass of *Yavamantha*(*Hordeum vulgare* L.) or 1-2 *Khakhara* made from barley flour	100g	2	100g	2	100g	2
DINNER(7.00pm)			DINNER(7.00pm)		DINNER(7.00pm)	
finger millet (*Eleusine coracana*) (Medium) (One type of traditional cereal) Or Red rice 1 small cup of *Moong dhal* Soup	20g	213	20g	213	15g	160
Steamed Vegetable (Above vegetables)	1 cup (5Table spoon)	85	1 cup (3Table spoon/105)	92.5	1 cup (4Table spoon)	68
Total		1679		1750		1350

Table 4: Alternate Diet

Food Item	Amount
EARLY MORNING (5.30am)	
Herbal Gruel (*Aegle marmelos, Cassia auriculata ,Centella asiatica ,Costus speciosus, Murraya koenigii, Passiflora edulis)*	1Cup
BREAKFAST (7.30am)	
Kidney beans are a variety of the common bean (*Phaseolus vulgaris*)	4Table spoon
Chickpea or chick pea (*Cicer arietinum*)	4Table spoon
MID MORNING	
Gruel of *Eleusine coracana*, or finger millet	30g
Banana(*Musa balbisiana*)	1Medium size

Citrus limon/ Psidium guajava/ Citrus sinensis/ Citrus aurantifolia/ Citrus paradise/ Aegle mamelos/ Zizyphus jujubalam	Juice of 100g
Boiled water of (*Aegle marmelos, Cassia auriculata)*	
Barley/Yava (*Hordeum vulgare* L.) boiled water	
LUNCH	
Red rice(*Oryza sativa)* /Suvadel(Type of traditional rice)	*½ Cup+1/2 suvadel*
Vegetable(Cucumber, Beans, Radish, Cabbage, Bitter gourd, Snake gourd, Mushroom)	
Leafy Vegetables(*Aegle marmelos, Cassia articulate, Centella asiatica, Costus speciosus, Murraya koenigii, Passiflora edulis, Alternanthera sessilis,Trigonella foenum graecum,)*	

Table 5: Macronutrients

Serial No	Botanical Name	Macro nutrients						
		Energy	Carbohydrate	Sugar	Dietary Fibers	Fat	Protein	Water
Rice (*Vrihi Dhanya*)								
01	White Rice (*Oryza sativa*)	544Kj	28.59g	-	0.3g	0.21g	2.38g	68.61g
02	Red Rice(*Oryza sativa*)	1548Kj	77.24g	-	3.5g	2.92g	7.94g	10.37gn
Cereal (*Shuka Dhanya*)								
01	Barley(*Hordeum vulgare* L.)	2726Kj	135g	-	31.8g	4.2g	23g	17.4g
02	Wheat (*Triticum aestivum*)	830Kg	42.5g	-	1g	1.5g	-	-
Cereal (*Shimbi Dhanya*)								
01	Green Gram(*Vigna radiate*)	80Kcal	14.5g	-	5.1g	0.4g	5.4g	-
02	Black Gram(*Vigna mungo*)	154Kcal	0.9g	-	347g	240g	59.6g	-
03	Kidney Beans(*Phaseolus vulgaris*)	130Cal	-	-	-	57g	4g	-
04	Dhal(*Lens culinaris*)	295g	48g	1.82g	12g	8g	16g	-
Cereal (*Ksudra Dhanya*)								
01	Finger Millet(*Eleusine cora-cana*),	3165Kj	146g	-	17.0g	8.4g	22g	17.3g
02	Sorghum(*Sorghum bicolor)*	90Kcal	9g	-	2.7g	1.2g	3.2g	-
Fruits (*Phala Varga*)								
01	*Musa balbisiana*	371kj	22.84g	12.23g	2.6g	0.33g	1.09g	-
02	*Psidium guajava*	288 kj	14.3 g	-	5.4 g	0.97g	2.5 g	80.6g
03	*Citrus sinensis*	405 kj	25 g	-	*10.6 g	0.2 g	1.5 g	-
04	*Citrus aurantifolia*	126 kj	10.54 g	-	2.8 g	0.2 g	0.7 g	*88.26g
05	*Citrus limon*	121 kj	9.32 g	2.5 g	2.8 g	0.3 g	1.1 g	-

06	*Citrus paradise*	175 kj	10.7 g	-	1.7 g	0.14 g	0.77 mg	-
07	*Punica granatum*	346 kj	18.7g	-	4 g	1.17 g	1.67 g	-
08	*Syzygium aqueum*	251 kj	15.56 g	-	-	0.230 g	0.720 g	83.13g
09	*Phyllanthus embilica*	-	21.8 g	-	1.9 g	0.02 g	0.07 g	77.1g
10	*Carica papaya*	163 kj	9.81 g	5.90 g	1.8 g	0.14 g	0.61 g	-
Vegetables (*Shaka*)								
01	Cabbage(*Brasica oleracea*)	17kj	-	-	1.4g	-	0.95g	-
02	Cucumber(*Parastichopus californicus*)	8kj	-	-	3g	-	34g	-
03	Radish (*Raphanus raphanistrum*)	25kj	-	-	2.4g	-	0.98g	-
04	Beans(*Phaseolus vulgaris*)	228kj	-	-	16.6g	-	12.48g	-
05	Bitter gourd(*Momordica charantia*),	16mg	3.4g	-	2.6g	1.3mg	2.3g	-
06	Snake gourd(*Trichosanthes* cucumerina),	86.2mg	12.5g	-	0.6g	3.9g	2g	-

Table 6: Micro nutrient

S:No	Botanical Name	Fat soluble Vitamins				Water soluble Vitamins							
		Vit A	Vit D	Vit E	Vit K	Thiamin B1	Riboflavin B_2	Niacin B_3	Pantothenic acid B_5	Pyridoxin B_6	Folate B_9	Folic Acid B11	Vitamin C
Rice													
01	White Rice (*Oryza sativa*)	-	-	-	-	0.167 mg	0.016 mg	1.835 mg	-	-	-	-	-
02	Red Rice (*Oryza sati-*	-	-	-	-	0.401 mg	0.093 mg	5.091 mg	1.493mg	0.509mg	20µg	-	-

	ti-va)												
Cereal(*Shuka Dhanya*)													
01	Barley	4.5IU	-	1mg	4mcg	1.2mg	0.5mg	8.5mg	0.5mg	0.6mg	35mcg	-	-
02	Wheat	10.8IU	-	1mg	2.3mcg	0.5mg	0.3mg	1.2mg	-	0.4mg	52.8mcg	-	-
Cereal(*Shimbi Dhanya*)													
01	Green Gram	38 µg	-	-	-	0.3mg	0.1mg	2.1mg	0.1mg	1.1mg	65 µg	-	-
02	Black Gram	-	-	-	-	0.273mg	0.254mg	1.447mg	-	0.281mg	216 µg	-	-
03	Kidney Beans	-	-	-	-	-	-	-	-	-	-	-	6mg
04	Dhal(Red lentils)	-	-	-	-	-	-	-	-	-	-	-	-
Cereal(*Kshudra Dhanya*)													
01	Finger millet	-	-	-	-	0.8mg	0.6mg	9.4mg	1.7mg	0.8mg	0.8mg	1.8mcg	-
02	Sorghum	10 µg	-	-	-	-	-	-	-	-	-	-	7mg
Fruits													
01	*Musa balbisiana*	3mcg	-	-	-	0.031mg	0.073mg	0.665mg	0.334mg	0.4mg	20mcg	-	5mg
02	*Psidium guajava*	-	-	-	-	0.06mg	0.06 mg	1.09 mg	-	-	-	49.1mcg	228mg
03	*Citrus sinensis*	420 IU	-	0.25mg	-	0.12mg	0.09 mg	0.9 mg	0.49mg	0.176mg	30mcg	-	136mg
04	*Citrus aurantifolia*	10 IU	-	0.24mg	-	0.03mg	0.02 mg	0.2 mg	0.217mg	0.043mg	8 mcg	-	29.1mg
05	*Citrus limon*	22 IU	-		*0.15mg	0.04mg	0.02 mg	0.10 mg	0.19mg	0.08 mg	11 mcg	-	53mg

06	*Citrus paradise*	*1150 IU	-	0.13 mg		0.043 mg	0.031 mg	0.204 mg	0.262 mg	0.053 mg	13 mcg	-	31.2 mg
07	*Punica granatum*	-	-	0.60 mg	16.4 mcg	0.067 mg	0.053 mg	0.293 mg	0.135 mg	0.075mg	38 mcg	-	10.2 mg
08	*Syzygium aqueum*	3 IU	-	-	-	0.006 mg	0.012 mg	0.260 mg	0.038 mg	-	-	-	14.3 mg
09	*Phyllanthus embilica*	-	-	-	-	0.03 mg	0.05 mg	0.18 mg	-	-	-	-	*625mg
10	*Carica papaya*	328 mcg	-	-	-	0.34 mg	0.05 mg	0.338 mg	0.1 mg	-	38 mcg	-	61.8 mg
Vegetables													
01	Cabbage (*Brasica oleracea*)	60IU	-	0.11 mg	81.5 mcg	0.046 mg	0.029mg	-	-	0.084mg	-	-	-
02	Cucumber (*Parastichopus californicus*)	55IU	-	0.02 mg	8.5 mcg	0.014 mg	0.017mg	-	-	-	0.021mg	-	-
03	Radish (*aphanus raphanistrum*)	-	-	-	0.04 mcg	-	0.034mg	--	-	-	-	-	-
04	Beans (*Phaseolus vulgaris*)	5IU				0.23 mg	0.11mg	o.966mg	0.393 mg	0.16mg	133 mcg	-	2.1 mg
05	Bitter gourd (*Momor-*	438 IU	-	-	-	37 mcg	37mcg	372mcg	-	40mcg	67mcg	-	78mg

	dica cha-rantia),												
06	Snake gourd(*Trichosanthes* cucumerina),	9.8IU	-	1.1 mg	-	-	-	-	-	11.3mg	-	-	30.5 mg

		Calcium	Phosphorus	Potassium	Magnesium	Sodium	Sulfer	Chloride	Iron	Manganese	Zinc	Copper	Selenium
Rice													
01	White Rice(*Oryza sativa*)	3mg	37mg	-	13mg	-	-		1.49mg	-	-	-	-
02	Red Rice(*Oryza sativa*)	23mg	333mg	223 mg	143mg	7mg	-	-	1.47mg	3.743 mg	-	-	-
Cereal(Shuka Dhanya)													
01	Barley	40.5IU	486mg	832 mg	245mg	22.1mg	-	-	6.6mg	3.6mg	5.1mg	0.9mg	-
02	Wheat	-	-	431 mg	36%	2mg	-	-	19%	-	-	-	-
Cereal(*Shimbi Dhanya*)													
01	Green Gram	13.5mg	56.,2 mg	155 mg	21.8 mg	6.2mg	-	-	0.9mg	0.2mg	0.4mg	0.2mg	-
02	Black Gram	18.7mg	135mg	134 mg	27.5 mg	2.5mg	-	-	5.8mg	0.9mg	0.9mg	0.2mg	-
03	Kidney Beans	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF	NF
04	Red lentils	-	-	398 mg	-	1031 mg	-	-	-	-	-	-	-
Cereal(*Ksudra Dhanya*)													
01	Finger millets	16mg	570mg	390 mg	228mg	10.0mg			6.0mg	228mg	3.4mg	-	-
02	*Sorghum*	9mg	120mg	270 mg	37mg	-	-	-	0.5mg	37mg	-	-	-
Fruits													
0	*Musa*	3mcg	-	-	-	0.031	0.073	0.665	0.334	0.4m	20mc	-	5mg

1	*balbi-siana*					mg	mg	mg	mg	g	g		
02	*Psi-dium guaja-va*	-	-	-	-	0.06 mg	0.06 mg	1.09 mg	-	-	-	49.1 mcg	228 mg
03	*Citrus sinensis*	420 IU	-	0.25 Mg	-	0.12 mg	0.09 mg	0.9 mg	0.49 mg	0.176 mg	30mcg	-	136 mg
04	*Citrus auran-tifolia*	10 IU	-	0.24mg	-	0.03 mg	0.02 mg	0.2 mg	0.217 mg	0.043 mg	8 mcg	-	29.1 mg
05	*Citrus limon*	22 IU	-		*0.15 mg	0.04 mg	0.02 mg	0.10 mg	0.19 mg	0.08 mg	11 mcg	-	53mg
06	*Citrus para-dise*	*1150 IU	-	0.13mg		0.043 mg	0.031 mg	0.204 mg	0.262 mg	0.053 mg	13 mcg	-	31.2 mg
07	*Punica grana-tum*	-	-	0.60mg	16.4 mcg	0.067 mg	0.053 mg	0.293 mg	0.135 mg	0.075 mg	38 mcg	-	10.2 mg
08	*Syzy-gium aqueum*	3 IU	-	-	-	0.006 mg	0.012 mg	0.260 mg	0.038 mg	-	-	-	14.3 mg
09	*Phyl-lanthus embili-ca*	-	-	-	-	0.03 mg	0.05 mg	0.18 mg	-	-	-	-	*625mg
10	*Carica papaya*	328 mcg	-	-	-	0.34 mg	0.05 mg	0.338 mg	0.1 mg	-	38 mcg	-	61.8 mg
Vegetables													
01	Cabbage (*Brasica oleracea*)	60IU	-	0.11 mg	81.5 mcg	0.046 mg	0.029 mg	-	-	0.084 mg	-	-	-
02	Cucumber (*Parasti-chopus cali-fornicus*)	55IU	-	0.02 mg	8.5mcg	0.014 mg	0.017 mg	-	-	-	0.021 mg	-	-
03	Radish (*Ra-phanus ra-phanistrum*)	-	-	-	0.04 mcg	-	0.034 mg	--	-	-	-	-	-
04	Beans (*Phaseolus*	5IU				0.23 mg	0.11 mg	o.966 mg	0.393 mg	0.16 mg	133mcg	-	2.1 mg

	vulgaris)												
05	Bitter gourd (*Momordica charantia*)	438IU	-	-	-	37mcg	37mcg	372mcg	-	40mcg	67mcg	-	78mg
06	Snake gourd(*Trichosanthes* cucumerina),	9.8IU	-	1.1mg	-	-	-	-	-	11.3 mg	-	-	30.5 mg

DISCUSSION

From modern medicine point of view, food for people with pre Diabetes should be low in sugar (though not sugar free) high in starchy Carbohydrate (especially foods with a low glycemic index) and in fiber content with low in fat especially saturated fat. Three diets have been planned according to this rule with concerning total calories of the diet. The beneficial effect of the dietary pattern on Diabetes Mellitus, glucose metabolism in general and traditional food pattern were associated with a significant reduction in the risk of developing type-2 Diabetes. The dietary pattern emphasizes a consumption of fat primarily from foods high in unsaturated fatty acids, and encourages daily consumption of fruits, vegetables, low fat dairy products and whole grains, low consumption of fish, poultry, tree nuts, legumes, very less consumption of red meat. Keeping all these things in mind above mentioned dietary sets have been planned for pre stage Diabetic patients. Fruits like *Musa species, Citrus limon,* and *Carica papaya* should be taken consciously because which are containing high sugar content. *Vitis vinifera* is having highest sugar content. So it is said that it should be avoided by pre stage of Diabetes patient. According to *Ayurvedic* classics fruit has been mentioned under the *Phala varga*. Fruits like *Jambu (Syzygium aqueum), Dadima (Punica granatum), Amalaki* (*Phyllanthus embilica),* and *Kaphitta* (*Limonia acidissima)* are mentioned as *Pathya* for Diabetes patients. All the fruits which are mentioned above having *Kashaya Rasa*, *Lagu, Ushna*, and *Theekshana Guna* which are opposite to the properties of *Kapha Dosha* and helps to alleviate *Meda* and *Mamsa Dhatu* vitiation.

Different type of rice has different GI. Foods with a low GI are easier on the body than those with a high GI. They are digested more slowly and minimize spikes after meals. People who trying to control their condition through diet, it is important that they can select the right rice to maintain a health with diabetes or at risk of diabetes. It can be explained that Red rice, *Bhasmati, Kalu Heenati, Suvadel, Rat Suvadel,* and *Ratdel* (Type of traditional rice) which contain low GI are good for pre stage of Diabetes patients. *Charaka Sutra* 27 has been mentioned that rice is under the *Shuka Dhanya*. Rice which is one year aged has properties of *Lagu, Dhatu Wardhaka* and *Mutra Vardhaka.* Hence it helps to reduce *Kapha Dosha* and *Kleda*

Whole grains include the entire grain kernel, which is a source of healthy fiber. Fiber is an

important element of the diet. It helps to control blood sugar levels and lowers risk of heart disease. Whole grains also contain lots of vitamins and minerals. Specially *Green Gram*, *Kidney beans* and *Dhal*. These are categorized under *Shimbi Dhanya* in *Ayurveda*. All these are having properties of *Ruksha, Laghu,* and *Ushna* which are opposite to the *Guna* of *Kapha*[6] and *Kleda*[7].

Leafy vegetables such as *Aegle marmelos, Cassia articulate, Centella asiatica, Costus speciosus, Murraya koenigii, Passiflora edulis*[8] are having properties of reducing blood glucose level. Leafy vegetables are ideal for weight management as they are typically low in calories. They are useful in reducing the risk of cancer and heart disease since they are low in fat, high in dietary fiber, and rich in folic acid, vitamin C, potassium and magnesium, as well as containing a host of phytochemicals, such as lutein, beta-cryptoxanthin, zeaxanthin, and beta-carotene. An increase of 1 serving/day of green leafy vegetables was associated with a 9 percent lower risk of diabetes.

Both starchy and non-starchy vegetables are an important part of diet. They offer plenty of fiber, vitamins and minerals, but are relatively low in calories. The major difference between starchy and non-starchy vegetables is that starchy one has higher starch content, thus they are also higher in calories. All above mentioned leafy vegetables and vegetables are having *Katu, Tikta,* and *Kashaya Rasa* as well as *Lagu* and *Ruksha Guna.* It is opposite *Guna* of all *Dodha* and *Dushya* of Diabetes Mellitus.

CONCLUSION

It can be concluded that control of diet plays a major role in prevention of type 2 Diabetes and thus different sets of diet can be recommended for pre Diabetes Mellitus patients considering individual status (Age, Body Mass Index, and Working Pattern). By adopting this, a large number of people can be prevented to develop Diabetes, ultimately reducing the burden on health care system.

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