

# Association of Dietary Patterns and CVD Risk Factors in Recently Diagnosed Type 2 Diabetes

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## **Abstract:**

*Significant association of dietary fat and CVD risk factor in recently diagnosed type-2 Diabetes was observed*

**Aim:** *To study the association of dietary fat and CVD risk factors in recently diagnosed type-2 Diabetes.*

**Materials and Methods:** *This is a hospital based cross-sectional study where 82 Diabetic subjects with newly diagnosed diabetes type 2, aged 20-50yrs, of both sexes and 68 Control subjects were recruited from the outpatient department of Osmania General Hospital. Patients were recruited after taking Institutes ethical committee approval and informed consent. Patients are on stable anti-diabetic medicines.*

**Results:** *There is a significant association observed between diabetes status and consumption of vanaspati (dalda) and palm oil at 5% level of significance. A significant association also observed on the status of total cholesterol levels, TG level and LDL level with the diabetes. High prevalence of diabetes is observed for those who are having abnormal status of total cholesterol (>200mg/dl), TG (>150mg/dl), LDL (100mg/dl). The BMI status of the subject is not significantly associated with diabetes within three months, during this time BMI may not associated with diabetes. Empirical results showed that, subjects with chronic energy deficiency (CED) are non-diabetic (67%) and the subjects with overweight/obese are diabetic (54%)*

**Conclusion:** *The intake of vanaspati (dalda) and palm oil is associated with the abnormalities of .lipid profile and HbA1C in recently diagnosed type-2 Diabetes.*

**Keywords:** *type 2 diabetes, cardio vascular disease and Lipid Profile.*

## **Introduction**

Diabetes mellitus comprises a group of metabolic disorders that share the feature of hyperglycemia<sup>[1]</sup>. It is worldwide in distribution and the incidence of both type 1 and type 2 diabetes is rising dramatically. Globally, diabetes is one of the most common non-communicable diseases leading to mortality and morbidity in many developed countries. The worldwide prevalence of DM has risen dramatically over the past two decades, from as estimated 30 million cases in 1985 to 285 million in 2010<sup>[2]</sup>. Based on current trends, the International Diabetes Federation projects that 438 million individuals will have diabetes by the year 2030 with majority of individuals in the age group of 45-56 years<sup>[3]</sup>. Diabetes is associated with the developed of premature atherosclerotic vascular disease. The increased risk has been attributed to the high prevalence of multiple atherosclerotic risk factors among diabetic patients. Cardiovascular disease is increased in individuals with type 1 or type 2 DM. In patients with Type-2 DM<sup>[4]</sup>, cardiovascular disease (CVD) is

the major cause of morbidity and mortality. In fact, diabetes is considered as a coronary equivalent. Approximately 80% of all deaths and more than 75% of all hospitalization in patients with diabetes are due to CVD<sup>[5]</sup>. The Framingham heart study revealed a marked increase in peripheral arterial disease, coronary artery disease, myocardial infarction, and sudden death (risk increase from one to five fold. In DM. The American heart association designated DM as a major risk factor for cardio vascular disease<sup>[6]</sup>. Coronary artery disease is more likely to involve multiple vessels in individuals with DM. The dyslipidemia that accompanies type-2 Diabetes place an important role in macro vascular complications<sup>[7]</sup>. This study was conducted to find out the association of dietary pattern and CVD risk factors, among recently diagnosed type 2 diabetes patients.

## **Materials & Methods:**

This is a hospital based cross-sectional and case-control study where 82 Diabetic subjects with newly diagnosed

diabetes type 2, aged 20-50yrs, of both sexes and 68 Control subjects were recruited from the outpatient department of Osmania General Hospital. Patients were recruited after taking Institutes ethical committee approval and informed consent. Patients are on stable anti-diabetic medicines. Patients of both sexes who are newly diagnosed with Diabetes Type 2 in the outpatient department of Osmania General Hospital were screened for the inclusion and exclusion criteria and recruited. Subjects aged between 20-50yrs, signed informed consent and willing to comply with instructions. All subjects with newly diagnosed diabetes type 2 without complications were included. Subjects with any acute or chronic infections, with complications, and inflammatory conditions such as Rheumatoid arthritis, SLE, Gout, etc are excluded. Pregnant women are excluded. Those participating in any clinical trial or consuming any dietary substitutes/Ayurveda supplements which are known to have anti-inflammatory activity are excluded from the study.

This has been done on all the subjects at baseline. Weight (to the nearest 0.5 kg), Height (to the nearest 0.1 cm), was measured using a non-stretchable fiberglass measuring tape (CMS Instruments) The body mass index (BMI) was calculated as body weight (kg) divided by body height (m) squared.

**Diet survey:** Food frequency questionnaire is used to know the dietary intake and pattern of the subjects.

#### Biochemical parameters:

Lipid profile, i.e., Total Cholesterol, LDL, VLDL and HDL cholesterol and also Fasting and Post lunch blood glucose values, HbA1c (glycated Hb) were analyzed using commercially available kits.

#### Results

**Table 1: Associated factors in patients with recently diagnosed type2 diabetes mellitus.**

DIET ITEM / LIPID PARAMETER	Consumption / level	Diabetes status				Association test	
		Normal		Diabetic		Chisqr	p-value
		n	%	n	%		
Dalda	Not Frequent	66	49.3%	68	50.7%	7.791	0.005*
	Frequent	2	12.5%	14	87.5%		
Palm oil	Not Frequent	51	52.0%	47	48.0%	5.132	0.023*
	Frequent	17	32.7%	35	67.3%		
Total Cholesterol Level	Normal	56	50.9%	54	49.1%	5.720	0.017*
	Abnormal	9	27.3%	24	72.7%		
Triglyceride level	Normal	58	55.8%	46	44.2%	17.968	0.000*
	Abnormal	6	15.8%	32	84.2%		
LDL level	Normal	54	53.5%	47	46.5%	8.901	0.003*
	Abnormal	11	26.2%	31	73.8%		
HDL Level	Normal	24	57.1%	18	42.9%	3.283	0.070NA
	Abnormal	44	40.7%	64	59.3%		

\*Indicates statistically significant

**Table 2 BMI distribution of patients studied**

BMI	Normal		Diabetic		Association	
	Count (N)	%	Count (N)	%	Chi square test	P-value
CED (<18.5)	4	66.7%	2	33.3%	2	0.435 NS
Normal (18.5-23)	12	38.7%	19	61.3%		
Over Weight/ Obesity (>=23)	50	45.9%	59	54.1%		

\*CED-Chronic Energy Deficiency, BMI-Body Mass Index

The association of diabetes is higher among the subjects who frequently consume dalda and palm oil. There is a significant association observed between diabetes status and consumption of dalda and palm oil at 5% level of significance. A significant association also observed on the

status of total cholesterol levels, TG level and LDL level with the diabetes. High prevalence of diabetes is observed for those who are having abnormal status of total cholesterol, TG, LDLs (Table 1) The BMI status of the subject is not significantly associated with diabetes, as the

subjects are selected as normal and observe for three months, during these three months, BMI may not be varied much to detect the diabetes. Empirical results showed that, subjects with CED are non-diabetic (67%) and the subjects with overweight/obese are diabetic (54%) (table2).

### Discussion:

Several studies have been evaluated the association between dietary fat and Cardiovascular disease but less known about their influence on risk of Diabetes mellitus<sup>[8]</sup>. The abnormal level of Total Cholesterol, Triglycerides and LDL are more than 200mg/dl more than 150mg/dl and more than 100mg/dl respectively. The level of HbA1C is between 6.5-7.5 to diagnose Diabetes. Recently there is evidence indicates dietary factors strongly effects HbA1C. However population based studies showed that protein; carbohydrate intake is not associated with blood glucose, insulin levels irrespective of Diabetes mellitus. The frequency of consumption means either daily or two to three times per week.

### Conclusion:

The intake of saturated fat viz. vanaspati (dalda) and palm oil can be an associated risk for the manifestation of Type-2 Diabetes.

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