Prevalence and risk factors of diabetes in kurukkalpatti village - Tenkasi District.

Jeeva PS

Assistant professor of Zoology, PMT College, melaneelithanallur, Tirunelveli - 627953

(ps.jeeva2005@gmail.com)

ABSTRACT

Diabetes mellitus is a serious metabolic disease, affecting people of all geographic ethnic or racial origin and its prevalence is increasing globally. Burden from this costly disease is high on the low and middle income countries where the impacts of modernization and urbanization have caused marked adverse changes in lifestyle parameter. As the age advances diabetes can damage the heart, blood vessels, kidneys, eyes and nerves. Obesity and weight gain significantly increase the risk. The study covered a sizable number of population i.e. 300 subjects in a village Kurukkalpatti. The age based cross sectional study was conducted. This study has shown that the rural communities of Tenkasi are unaware about the risk and complications of diabetes mellitus. The source of population of individuals aged between 25 – 85 yrs permanently living in the village. To access the magnitude of the disease, house to house survey is performed with a well designed questionnaire. Family history of diabetes may be a useful tool to identify the individuals increased risk of developing to disease. The present study reveals that the age distribution show a gradual increase with age but disease maximum among the 46 – 55 yrs age group in females and in males 56 – 65 yrs age group. The present investigations demonstrated that physical activity can significantly promote control of blood glucose level in elderly diabetics. The prevalence of diabetes among urban dwellers usually higher than among rural households. Diabetes can be prevented among prediabetic individuals by improvements in diet habits. The patient education is necessary to prevent infections earlier and management of infections.

I. INTRODUCTION

Diabetes mellitus is a metabolic disease which is characterized by elevated levels of blood glucose or blood sugar levels (1). Diabetes mellitus is a serious metabolic disease, affecting people of all geographic ethnic or racial origin and its prevalence is increasing globally (IDF Diabetes Atlas. 2013) (Albetri KGMN, Zimmet p, and show J. 2007). Burden from this costly disease is high on the low and middle income countries (LIMIC) where the impacts of modernization and urbanization have caused marked adverse changes is lifestyle parameter.

Cognitive disorders, depression, chronic pains, polypharmacy, induries from falling, and difficulties in urination are some of the geriatric symptoms (Calofornia Healthcare Foundation/American Geritrics JAGS 2003;) The risk of these syndromes in diabetics is higher then those in non-diabetics. (Bourdel-Marchasson I, Helmer C, Fagot-Campagna A, et al.2007;) Depression and psychosocial stressors are more common in diabetics is than in non-diabetic groups (Gavard JA, Lustman PJ, Clous RE. 1993). Age is one of the variables influencing the prevalence of diabetes and Impaired Glucose Tolerance (IGT). (Harries MI, Flegal KM, Cowie CC. 1998;) For instance, in those 45-55 years of age in the USA, diabetes is four times more common than in the ones in the 20-44 aged. (Harris MI, Flegal KM, Cowie CC.1998) Currwntly, at least 20% of people aged over 65 years old are estimated to be suffering from diabetes and the figure amounts to 50% in some res such as Hispanics. On the other hand, the world elderly population is to the increase (Tessier D, Meneilly G. Diabetes 2001). Different epidemiological studies have reported varying diabetes prevalence in the elderly, with the reasons cited being different in terms of not only the dates of the studies but also the diagnostic critseria and the racial groups recruited into the studies.(Choi KM, Lee J. Kim DR, et al. 2002) In both genders, the prevalence of obesity in middle age makes the person susceptible to diabetes (Nakano 2007) (Motta M, Bennati E, Capri M, et al.2008). In addition, there were reports from Italy (Tedeschi G, Cavazzuti F. 1959) and Trinidad showing an increased frequency of blood group B among diabetics, but in Germany (Maehr G 1959) and in Glasgow (Craig J, Wang. J.1955) it was concluded that there was no significant association between ABO blood groups and diabetes. Patients with chronic conditions such as diabetes, kidney failure or extensive burns are all at a give risk for developing fungal infection. (Ekta Bansal et al., 2008. Khaled H Abu-Elteen et al. 2006. Bartelink ML. et al 1998). The current criteria for the diagnosis of diabetes in both clinical and epidemiological settings do not recommend different cut points for female and male participants (Rohlfing CL, Little RR, Wiedmeyer et al., 2000) (McCance DR, Hanson RI, Charle MA, jacobsson LT, Pettitt DJ, Bennett PH et al, 1994).

Modifiable risk factors are overweight, obesity, physical inactivity, high blood pressure, etc., while non-modifiable risk factors are, age, ethnicity and history of gestational diabetes. Both environmental and genetic factors add the complex etiology of the disease. (Keka To, Millikan RC, Martin C, Rahka-Burris TK, Sandler RS. 2003). As the age advances diabetes can damage the heart, blood vessels, kidneys, eyes and nerves. The complications of diabetes are diabetic neuropathy, diabetic retinopathy, diabetic nephropathy, peripheral artery disease and coronary artery diseases (WHO 2017).

Thus, family history of diabetes may be a useful tool to identify the individuals at increased risk of developing to disease and target behaviour modifications the could potentially delay disease onset and improve health outcomes.(Baptist -Roberts K, Gary TL, Beckles GL, Gregg EW, Owens M, Porterfield D, et al. 2007). The risk of other major amputations (proximal amputations to the foot heel) (Lawrence SM Wraight PR Campbell DA et al. 2004) due to again and increase in visual loss may intensify as well. Moreover, sight weakness leads to not daily foot checking by old patients (Thomson FJ, Masson EA.1992). For prevention of diabetic foot ulcers, an identification of high risk people avoiding wearing unsuitable shows, and not walking with barefoot are usually suggested.

Obesity and weight gain significantly increase the risk (Hu FB, Manson JE, stampfer MJ, coldifz G, Liu s, Solomon CG, et al.2001) (colditz GA, willlett WC, Rotnizky A, manson JE. 1995) and physical inactivity further elevates the risk regardless of obesity (Helmeich SP, Ragland DR, Leung RW, paffenbarger 1991.) Cigarette smoking is associated with a small increase (Hu FB, Manson JE, Stampfer MF, Colditz G, liu S, Solomon CG, et al.2001) (Ajani UA, hennekens CH, spelsberg A, manson JE. alcohol 2000) and moderate alcohol consumotion with a decrease (Ajani UA, hennekens CH , spelsberg A, manson JE . alcohol. 2000) (wei M gibbon LW, Mitchell TL, kampert JB 2000) in the risk of diabetes. In addition, a low fiber diet with a high glycemic index has been associated with an increased risk of diabetes (liu S , manson JE , stampfer MJ , Hu FB, giovannucci E,colditz 2000.) and specific dietary fatty acids may differentially affect insulin resistance and the risk of diabetes (vessby B, dietary 2000) (Hu FB, van dam RM, liu S.diet and risk 2001) it is also known that lifestyle and particularly dietary habits, play an important role in the development of diabetes (kastorini CM , panagiotakos DB 2009).

Diabetes retinopathy (DR) is the ocular manifestation of end-organ damage in diabetes mellitus. Eduard Jaeger first described the visible retinal changes of DR in 1856, but the causal relationship between retinal exam findings and diabetes mellitus was controversial until 1875 when Leber confirmed the findings (Wolfenserger TJ, and Hamiton AM 2001Diabetic retinopathy-an historical review. Semin Ophthalmol. 2001)

II. MATERIALS AND METHODS

2.1. STUDY AREA

The study was conducted kurukkalpatti village 4 km away from Sankarankovil, Tenkasi district.

2.2. STUDY DESIGN

The age based cross sectional study was conducted from Jan-01 to Feb-15, 2020. The study covered a sizable number of population i.e, 300 subjects in a village kurukkalpatti. The source of population of individuals aged between 25-85 year permanently living in the village.

2.3. STUDY POPULATION

The survey population is with socioeconomic capabilities having Agricultural background. The study population was covered a distance of approximately 4 km on road. The survey group is residing in equal number of old as well as small tiled and thatched houses.

2.4. IDENTIFICATION OF DIABETIC CASES

To access the magnitude of the diseases house to house survey is performed with a well designed questionnaire. The use of questionnaire is an acceptable tool in diabetic survey (L.Riley, R.Guthold, M.cown etal, 2016; F.Azizi, A.Ghanbarian, A.A. Momenan etal, 2009) standard methods are used for the collection of data.

2.5. BLOOD GROUPING

To identify the different blood groups and analyse the cross matching slide method is used (Priti Elhence et al.,, 2014).

III. Results

Diabetes is a disease which is caused by the inadequate production of insulin by the body or by the body not being able to properly use the insulin that is produced thereby resulting in hyperglycemia (high blood glucose levels).

The present study population includes 300 subject covered a village Kurukkalpatti, Tenkasi district. The diabetic survey out of 300 persons 70 subjects are diabetics and 230 persons are non diabetics in the study population Fig.1.

Fig.1. shows the diabetic and non diabetic in the study population
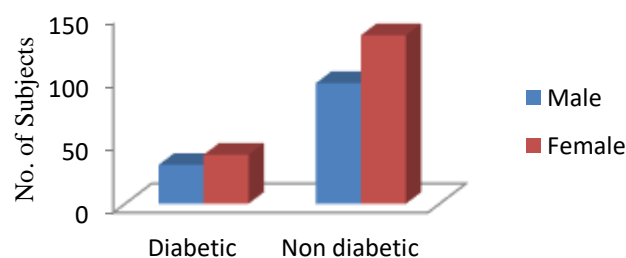

Table.1 shows the sociodemographic characteristics of the study population. Majority of the persons belong to age grup of 25 – 35 years (54%) followed by the age group of 46 – 55 years (17%). Female participants were comparatively higher (57.6%) than the male (42.3%). Most of the study participants were illiterates (42%). Regarding their marital status (64.33%) were married and (26.3%) were unmarried. Majority of study participants belongs to middle class (74.67%) socioeconomic status

followed by low (24.33%) and high class(1%). The body mass index of the study population mostly were thin (48%) 37% were healthy, 11.66% were over weight and 3.33% were obese.

Table.1. Socio demographic characteristics of the study participants. N = 300

SI.No.	Sociodemographic details	Frequency; N = 300	Percentage
1.	Age		
	25 – 35	151	50.3
	36 – 45	25	8.3
	46 – 55	33	11
	56 – 65	17	5.6
	66 – 75	3	1
	76 - 85	1	0.3
2.	Gender		
	Male	127	42.3
	Female	173	57.6
3.	Educational qualification		
	Illiterate	82	27.3
	Primary	17	5.6
	SSLC	12	4
	HSc	40	13.3
	Degree	74	24.6
	Post graduate	4	1.3
4.	Marital status		
	Married	151	50.3
	Unmarried	79	26.3
5.	Socioeconomic status		
	Low		
	Middle	29	9.6
	High	199	66.3
		12	4

Table.2. indicates the blood groupwise distribution of the diabetic and non diabetic subjects. The study comprises the majority of the diabetic cases (45.7%) have AB blood group. Followed by B group (15.7%), (21.4%) have A group and (17%) having O group. The non diabetics also have 81 persons (41.79%).

Table.2. denotes the blood groupwise distribution of study subjects. N = 300

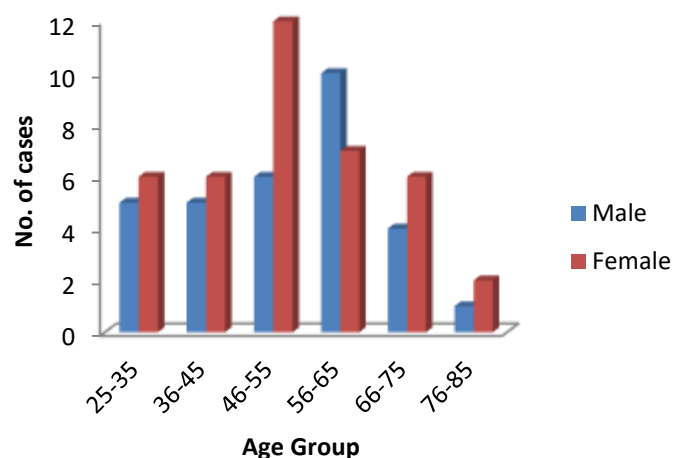| Blood groups	Diabetics			Non diabetics		
	Male	Female	Total	Male	Female	Total
A	5(16.1)	10(25.6)	15(21.4)	26(27.08)	16(11.94)	42(18.26)
B	6(19.35)	5(16.1)	11(15.7)	23(23.95)	42(31.34)	65(28.26)
AB	11(35.39)	21(53.84)	32(45.7)	25(35.71)	56(41.79)	81(35.21)
O	9(29.03)	3(7.69)	12(17)	22(22.9)	20(14.92)	42(18.26)
Total	31	39	70	96	134	230

Table.3. shows the behavioural characteristics of study subjects. Most of the study persons prefer mixed diet (93.6%) some of them are vegetarians (6.33%).Majority of the study persons physical activity were farm activities123 persons (41%) followed by 26% having regular exercise and 9.66% having sedentary work. About 11.66% persons were alcoholic, 9.33% were smokers and 15% were beetle nut eaters.

Table.3. shows the behavioural characteristics of study subjects. N = 300

SI. No.	Behavioural characteristics	Frequency	Percentage
1.	Food preference		
	Vegetarian	19	6.33
	Mixed	281	93.6
	Staple food		
	a. Wheat	28	9.33
	b. Rice	272	90.66
2.	Physical activity		
	Sedentary	29	9.66
	Regular exercise	78	26
	Farm activities	123	41
3.	Habits		
	Alcoholic	35	11.66
	Non -alcoholic	265	83.33
	Smoker	28	9.33
	Non- smoker	272	90.66
	Beetle nut user	45	15
	Non- beetle nut users	255	85
4.	Body Mass Index (BMI)		
	Thin (18.5)	111	37
	Healthy(18.6 – 24.9)	144	48
	Over weight(25 – 29.9)	35	11.6
	Obese	10	3.33

Fig.3. pictures out the diabetes family history of study population
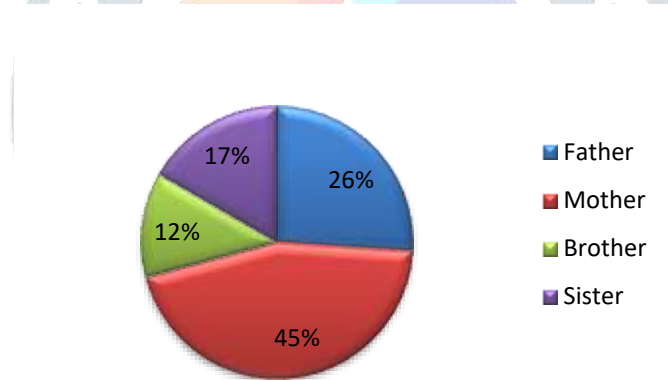
Most of the diabetic cases to 27.14% retinopathy and followed by 24,28% were bacterial infection, 14.2% respondents have nephropathy and least cases have 14.2% nephropathy.Majority of the cases have to take 52.85% pills, 32.85% cases take insulin vaccine and 12.8% cases take herbal medicine.Among the participants who had age onset of diabetes with in 46 – 55 yrs (25.71%). The least number cases with in the age group 76 – 85 yrs (4.28%).

Table.4 denotes health risks, BMI and age onset of disease of diabetic cases.

SI.No.	Variables	Frequency	Percentage
1.	Health risks		
	Retinopathy	19	27.14
	Neuropathy	9	12.85
	Nephropathy	10	14.2
	Bacterial infection	17	24.28
2.	Type of medication		
	Insulin vaccine		
	Pills	23	32.85
	Herbal medicine	37	52.85
		9	12.8
3.	Age onset of diabetes		

25 – 35	11	15.79
36 – 45	11	15.79
46 – 55	18	25.71
56 – 65	17	24.28
66 – 75	10	14.28
76 - 85	3	4.28

IV. DISCUSSION

A diabetic is a difficult disease to treat and manage throughout the world (Kastorini CM and Panahioyoke DB, 2009). Diabetics is resulted from an interaction between environmental and genetic factors. (Steyen NP et.al, 2004). The data collected by our survey grossly indicates that a significant number of the population have little or no awareness of Diabetes mellitus. Those who are aware only know the disease by the name "Sugar" and have failed to hear the words "Diabetes mellitus." Higher relative risk of macrovascular diseases in those diagnosed with type 2 diabetes between 18 and 45 yrs of age than in those identified after 45 yrs of the age, (Hiller TA and Pedulalcl, 2003), Similarly (Song S..H and Hardisty CA 2009) showed that in coherts with type 2 diabetes with disease onset before and after 40 yrs of age, by the sixth decade of life. It is true in our study tour. The age distribution show a gradual increase with age but the disease maximum among the 46-55 yrs age group in females and in males 56-65 yrs age group. Our study too supports this view.

The studies revealed that there was a significant association between smoking habit and diabetes mellitus as noted by previous studies (D. Kapoor et.al, 2014), N.H.Cho, et.al,2009). Similar findings were also seen in our study. The prevalence of diabetes among urban dwellers is usually higher than among rural households (J.B.Onkin et.al, 2008). The present study also seen in similar finding. The studies conducted in Irania city in the year 2004, (17.4). Suffered from diabetes there was a significant difference in terms of diet between diabetics and non-diabetics (Dorosty A.R. and Alavi Neini AM 2007). The present study also corroborates these findings.

Several investigations have demonstrated that physical activity can significantly promote control of blood glucose level in elderly diabetics. Lighten berg pc.et.al, 1997), (Petterson T et.al, 1998). The present study also seen in above results.Some studies shown that the risk of diabetes increases with the normal BMI of 21 kg/m² Coditz GA et.al, 1995). Similarly findings are seen in our study. Many studies have been shown that awareness about the diabetics and its complication is poor among the general population especially in rural areas. (Murugesan N et.al, 2007), (Mohan D et.al, 2005). There is an urgent need to create awareness among the population regarding diabetes and about the serious consequences of this disorder. So we have to select the rural area.

Some studies showed that 68.8% of the study participants had family history of diabetes. Similar finding were observed in studies done by (Patal et.al, 2013), which showed positive family history. This shows the family history of diabetics is highly prevalent among diabetic patients. Our study is also corroborates these findings. Intensive control of blood sugar led to a significant 25% reduction in the risk of any microvascular complications, including retinopathy. UK prospective diabetes study group also reveals most of the diabetes patients having above health risks.

V. CONCLUSION

This study shown that the rural communities of Tenkasi are unaware about the risk and complications of diabetes mellitus. The study recommends the following aspects to the people of diabetes. Self care is one of the most important aspects of diabetes management.Active lifestyle including regular physical activity atleast an hour a day, necessary to reduce the risk of diabetes. Avoid to intake of alcohol and quit smoking. Diabetes can be prevented among prediabetic individuals by improvements in diet habits. Patient empowerment is vital in diabetes management. People with family history of diabetes should be more alert to evade from the onset of diabetes. Go for vegetarian diet try to avoid meat. The patient education is necessary to prevent infections earlier and the management of infection.Always keep your mind and soul happy.

VI. REFERENCES

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