Original Research Article

Prevalence and knowledge, attitude, practices about diabetes mellitus among elderly people in urban slums of Puducherry India

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Abstract

Background: Diabetes mellitus (DM) is a chronic metabolic disease which is prevalent globally. The World Health Organisation (WHO) has warned of an alarming increase in the population with type II diabetes mellitus both in developed and developing countries over the next two decades. This study is aimed at estimating the prevalence of diabetes mellitus among the elderly persons residing in urban slums of Pondicherry.
Methods: A cross-sectional community based study was conducted with an objective to estimate the prevalence of diabetes and to assess the knowledge, attitude and practices regarding diabetes, treatment and control of diabetes, among elderly persons (60 years and above) residing in an urban slum. A house to house community based study was carried out among a randomly selected sample of 202 persons aged 60 years and above, from urban slum of Pondicherry. **Results:** Total 202 participants were interviewed, 103 (53%) were males and 99(49%) were females. The prevalence of impaired fasting blood glucose is 6.9 (7%), while prevalence of diabetes is found to be 20.3%. A total of 181(90%) of participants have heard about Diabetes Mellitus while 10% have not ever heard about Diabetes Mellitus, while 155 (77%) participants agreed that regular exercise keeps diabetes under control while almost equal number 149(73.4%) agreed that people with DM should control their weight and 144(71%) dietary modification is useful for keeping DM in control. A total of 177(88%) did not know whether complications can be prevented by timely investigations while just 12% knew that it is possible to prevent complications of diabetes mellitus with timely investigation. 77% knew that regular exercise keeps diabetes under control but during the last one month 106(50%) either rarely or never participated in any moderate physical exercise.**Conclusions:** Strengthening primary health care services in urban slums, with special emphasis on vulnerable population like elderly persons, is needed. Non-communicable diseases are a major cause of morbidity and mortality in this age group, and deserve special attention of policy makers and programme managers.

Keywords: Diabetes mellitus, Elderly people, Behaviour, Attitude.

Introduction

Diabetes mellitus is a chronic metabolic disease prevalent globally, and emerging rapidly with a status of potential epidemic in India [1]. The most important demographic transition in India, as well as in the world, is due to increase in the number of aged persons, leading to an increase in the prevalence of hypertension and diabetes [2]. Recently India has witnessed demographic transition, with a reduction in crude birth rate and increase in life expectancy [3-4].

While, the elderly populations are susceptible to many non-communicable diseases, including diabetes [5], same time, it can lead to increased morbidity and mortality with serious complications like diabetic retinopathy and diabetic neuropathy [6]. The WHO had alarmed of an alarming increase in the population with type II diabetes mellitus both in developed and developing countries over the next two decades [6-7]. The lack of understanding of patient characteristics like personality, the attitude of the patient and the lack of public awareness regarding diabetes mellitus are common among elderly people lead to increase in prevalence of the disease and subsequently morbidity and mortality [7].

However, there is a large gap between knowledge and attitude among the diabetic patients and imparting proper knowledge regarding diabetes will improve the knowledge of patients and change their attitude [8]. Four out of five adults with diabetes live in low-and middle-income countries (LMIC) [9-10]. Disability among the elderly is a cause of significant burden, and there is a dearth of relevant research from low- and middle-income countries [11-12]. In spite of the fact that one third of Indians live in urban areas, the incidence of diabetes and its determinants among urban residents has not been studied to date [13]. The mortality and morbidity related to diabetic complications poses a great threat and burden to a nation's economy [14]. It is also reported that there is a lack of public awareness regarding diabetes mellitus in elderly people [15], and thus educating the diabetic patient is essential for prevention of complications [16].

Moreover, a study from South India revealed that 20.1% of type 2 diabetes patients did not receive any treatment while 71.2% had poor glycaemic control [17-18]. Despite the huge burden, diabetes care remains suboptimal in LMIC countries including India. Studies from

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India, reveal a huge gap between the recommended and actual diabetes care, resulting in poor health outcomes [17-19]. Several studies have shown that there is a large gap between knowledge and attitude among the diabetic patient and proper knowledge regarding diabetes will improve the knowledge of patients and change their attitude [15, 20-22]. Hence an attempt was made to assess the level of awareness in elderly people regarding diabetes in urban population of Pondicherry.

Objectives

This study objectives were to estimate the prevalence of diabetes among elderly persons residing in an urban slum, and to assess the knowledge, attitude and practices regarding diabetes and treatment and control of diabetes among elderly people (60 years and above) in urban slums of Puducherry, India.

Methodology

A cross-sectional community based study among elderly persons aged 60 years and above residing in Muthialpet, an urban slum of Pondicherry, was conducted and data pertaining to sociodemographic variables, participant's awareness and treatment of diabetes was recorded. During the house to house visit the fasting blood sugar was also estimated using an automated glucometer, and after thoroughly explaining the study objectives and obtaining consent of the participant. For all practical purposes, diabetes was diagnosed if fasting blood glucose is > or = 126 mg/dL, or if the participant is taking treatment for diabetes and Impaired fasting blood glucose was diagnosed if fasting blood glucose is 110-125 mg/dL.

Pre-tested validated questionnaire regarding the knowledge, attitude and practice of elderly people about diabetes mellitus was used to collect data from among a sample of 410 elderly people as estimated by considering the prevalence of diabetes among the elderly persons as 13.4% as reported by multicentre study carried out in 10 cities in India [23] and with a relative precision of 25% and α error of 5%, the sample size was estimated to be 410. Keeping in mind that it is a student project and considering the time available for data collection and considering a non-response rate of 10% we have planned the sample size to be 200.

A house to house enumeration of elderly in the slum which was done by the concerned Govt. Health Centre in the field practice area, has given the list of all elderly in the slum. All eligible elderly were recruited to the study if, age is above 60 years and residing in the study area for at least since last 6 months, while those not fulfilling and not willing were not included in the study.

Data were analysed using Microsoft Excel 2010 version and appropriate statistical software. Descriptive statistics and inferential statistics were done and explained with appropriate percentage, standard deviation, confidence intervals and chi-square test was utilised to assess the trend wherever applicable.

Ethical Considerations

Permission to conduct the community based study was obtained from the Institute Ethical committee and Research committee. The information collected on the Proforma and electronic data was kept confidential in the Department of Community Medicine. Informed consent for participation in the study was taken prior to the enrolment.

Results

Table 1: Age distribution of participants

Age (yr)	Male N (%) (103, 51%)	Female N (%) (99, 49%)	Total N (%) (202, 100%)
60-69	60 (49.6%)	61 (50.4%)	121(59.9%)
70-79	36 (51.4%)	34 (48.6%)	70 (34.6%)
=/>80	7 (63.6%)	4 (36.4%)	11 (5.4%)
Total	103 (51.0%)	99 (49.0%)	202 (100.0%)
Mean Age +/- SD	69+/-7	69+/-5	69+/-6
95 % C I for Age	62 to 76	64 to 74	63 to 75

A total of 202 participants were interviewed, 103 (53%) were males while 99(49%) were females (Table 1), having minimum age of 60 yrs and maximum age 91 yrs with 69 yrs as mean age of the participants and 60% (i.e. six out of every 10 participants) were belonging to age group 60-69 years (Table 1)

Table 2: Prevalence of diabetes and impaired fasting blood glucose level among participants

	Normal N (%)	Impaired Fasting Blood Glucose N (%)	Diabetes N (%)	Total N (%)	Sig.
Total	147 (72.8)	14 (6.9)	41 (20.3)	202 (100)	
Male (n=103)	76 (73.8)	6 (5.8)	21 (20.4)	103 (51)	p=0.818*
Female (n=99)	71 (71.7)	8 (8.1)	20 (20.2)	99 (49)	
60-69 years (n=121)	85 (70.2)	11 (9.1)	25 (20.7)	121 (60)	
70-79 years (n=70)	51 (72.9)	3 (4.3)	16 (22.9)	70 (34.7)	p=0.201*
=/>80 years (n=11)	11 (100)	0	0	11 (5.4)	

***p>0.05 non-significant**

The prevalence of Impaired fasting blood glucose is 6.9 (7) %, with more among females (8.1%) compared to males (5.8%) while Prevalence of diabetes is found to be 20.3%, equally prevalent among male and female but 60% diabetics are from 60-69 yr age groups, it means 6 out of every 10 diabetic cases are in the age group of 60-69 yr (Table 2).

Table 3: Distribution of participants as per addiction among genders

	Addiction-Yes, N (%)	Addiction-No, N (%)	Sig.
Male (n=103)	35 (34.0%)	68 (66.0%)	
Female (n=99)	1 (1.0%)	98 (99.0%)	p<0.001**
Total (n=202)	36 (35%)	166 (65%)	

**p<0.001 Significant

Out of 202 participants, 35% (n=36) participants reported positively for addiction, males (n=35/103, 34%) reported significantly (p<0.001) more addiction compared to females (n=1/99, 1%). (Table 3)

Table 4: Participants' responses to questions pertaining to knowledge about Diabetes Mellitus

Questions pertaining to Knowledge about Diabetes Mellitus		Male (n=103, 51%)		Female (n=99, 49%)		Sig.
		N	%	N	%	
Ever heard about dm	Yes	89	49.2	92	50.8	p>0.05*
	No	14	66.7	7	33.3	
	Total	103	51.0	99	49.0	
If yes, from where?	Health Personnel	17	56.7	13	43.3	p>0.05*
	TV/Radio	13	52.0	12	48.0	
	Family Member	14	50.0	14	50.0	
	Friend	17	37.8	28	62.2	
	Newspaper/Magazine	5	71.4	2	28.6	
	Others	23	50.0	23	50.0	
	Total	89	49.2	92	50.8	
Family member with diabetes mellitus	Yes	24	49.0	25	51.0	p>0.05*
	No	79	51.6	74	48.4	
	Total	103	51.0	99	49.0	
If yes, mention relationship	Brother	4	8	2	4	p>0.05*
	Father	3	6	1	2	
	Husband	0	0	8	16	
	Mother	1	2	3	6	
	Sister	9	18	8	16	
	Son	0	0	3	6	
	Wife	8	16	0	0	
	Total	24	50	25	50.0	
What causes DM?	Close contact with Diabetic	3	1.5	3	1.5	p>0.05*
	Eating more Sugar	42	20.8	36	17.8	
	Lack/Defect of Insulin	15	7.4	17	8.4	
	Destiny	15	7.4	19	9.4	
	Others	6	3.0	2	1.0	
	Do not know	22	10.9	22	10.9	
	Total	103	51.0	99	49	
Most commonly affected age groups	Young adults	6	50.0	6	50.0	p>0.05*
	Middle aged	68	51.5	64	48.5	
	Others	16	47.1	18	52.9	
	Do not know	13	54.2	11	45.8	
	Total	103	51.0	99	49.0	

*p>0.05 non-significant

Out of 202 participants, 181(90%) of participants have heard about Diabetes Mellitus while 10% (n=21) have not ever heard about Diabetes Mellitus. One fourth of those having knowledge of diabetes 45 (24.9%) knew about it from their friends followed by health personnel 30(16.6%) and family member 28(15.5%). One fourth participants i.e. 49(25%) have one or the other family member suffering with diabetes mellitus. More/excess sugar consumption has been quoted by majority of participants 78(38.8%) as the main cause of Diabetes mellitus. There is no significant gender difference for knowledge about diabetes Mellitus (Table 4).

Table 5: Participants' responses to questions pertaining to Attitude towards Diabetes Mellitus

Questions pertaining to Attitude towards Diabetes Mellitus	Level of response	Male (n=103, 51%)	Female (n=99, 49%)	Sig.
Regular exercise keeps DM under control	Agree	77 (38.1)	78 (38.6)	p>0.05*
	Disagree	0	1 (0.5)	
	Don't know	26 (12.9)	20 (9.9)	
	Total	103 (51)	99 (49)	
People with DM should control their weight	Agree	74 (36.6)	75 (37.1)	p>0.05*
	Disagree	2 (1)	5 (2.5)	
	Don't know	27 (13.4)	19 (9.4)	
Dietary modification is useful for keeping DM in control	Agree	71 (35.1)	73 (36.1)	p>0.05*
	Disagree	4 (2)	6 (3)	
	Don't know	28 (13.9)	20 (9.9)	
DM people should abstain from addiction	Agree	54 (26.7)	61 (30.2)	p>0.05*
	Disagree	20 (9.9)	6 (3)	
	Don't know	29 (14.4)	32 (15.8)	
People with DM should monitor BSL at home	Agree	13 (6.4)	20 (9.9)	p>0.05*
	Disagree	50 (24.8)	38 (18.8)	

	Don't know	40 (19.8)	41 (20.3)	
People with DM can lead normal life with Blood Sugar controlled	Agree	27 (13.4)	30 (14.9)	p>0.05*
	Disagree	35 (17.3)	33 (16.3)	
	Don't know	41 (20.3)	36 (17.8)	
Once DM controlled, eating restrictions are no longer required	Agree	31 (15.3)	35 (17.3)	p>0.05*
	Disagree	28 (13.9)	30 (14.9)	
	Don't know	44 (21.8)	34 (16.8)	
Insulin is last treatment option and should be avoided as far as possible	Agree	12 (5.9)	10 (5)	p>0.05*
	Disagree	8 (4)	9 (4.5)	
	Don't know	83 (41.1)	80 (39.6)	

*p>0.05 non-significant

Out of 202 participants, 155(77%) agreed that regular exercise keeps diabetes under control while almost equal number 149(73.4%) agreed that people with Diabetes should control their weight and 144(71%) dietary modification is useful for keeping Diabetes in control. There is no significant gender difference for the attitude towards diabetes mellitus.

Table 6: Knowledge about importance of investigation for diabetes

Questions pertaining to investigation		Male N (%) 103 (51)	Female N (%) 99 (49)	Sig.
Complication can be prevented by timely investigations	Yes	10 (9.7)	14 (14)	p>0.05*
	No	0	1 (1)	
	Don't know	93 (90.3)	84 (84)	
If yes, which investigations	Blood sugar estimation	1 (0.9)	7 (7)	p>0.05*
	Blood, Eye and Foot examination	9 (9.7)	7 (7)	

*p>0.05 non-significant

Out of 202 participants, 177(88%) did not know whether complications can be prevented by timely investigations while just 24(12%) knew that it is possible to prevent complications of diabetes mellitus with timely investigation and 8(8%) of them knew that not only blood but eye and foot examinations are equally important for prevention of complications. (Table 6).

Table 7: Behaviour of participants towards physical activity

Questions pertaining to behaviour		Male N (%) 103 (51)	Female N (%) 99 (49)	Sig.
For the past one month how often have you taken part in any moderate physical activity	More than 5 days a week	3 (1.5)	7 (3.5)	p>0.05*
	2-5 days a week	23 (11.4)	12 (5.9)	
	Once a week	23 (11.4)	23 (11.4)	
	2-3 times a month	3 (1.5)	2 (1)	
	Rarely/never	51 (25.2)	55 (27.2)	
If rarely/never, state reason	No need	6 (5.7)	6 (5.7)	p>0.05*
	No reason	18 (17)	19 (18)	
	No time	8 (7.5)	4 (3.7)	
	Weakness	19 (17.9)	26 (24.5)	
	Total	51 (48.1)	55 (51.9)	
How often have you got your BSL examined	More than once a month	1 (1)	3 (3.0)	p>0.05*
	Once a month	8 (7.8)	6 (6.1)	
	Not measured	68 (66)	67 (67.7)	
	Others	26 (25.2)	23 (23.2)	
Do you use any device to monitor BSL	Yes	9 (8.7)	6 (6.1)	p>0.05*
	No	94 (91.3)	93 (93.9)	
If yes, how often do u check	More than 5 days a week	0	0	p>0.05*
	2-5 days a week	0	0	
	Once a week	0	1 (16.7)	
	2-3 times a month	7 (77.8)	4 (66.7)	
	Rarely/never	1 (11.1)	1 (16.7)	
	Don't know	1 (11.1)	0	

*p>0.05 non-significant

Out of 202 participants, 155(77%) knew that regular exercise keeps diabetes under control but during the last one month 106(50%) either rarely or never participated in any moderate physical exercise while almost half of them 45(22.2%) quoted weakness as the major reason for not doing physical exercise. Total 135(66.8%) have not measured their BSL, just 15(7.5%) use any device to monitor BSL. (Table 7)

Table 8: Behaviour of participants towards body weight and lipid level estimation

Questions pertaining to behaviour		Male N (%) 103 (51)		Female N (%) 99 (49)		Sig.
		N	%	N	%	
How often have you measured your weight?	More than once a month	2	1.9	0	0	p>0.05*
	Once a month	15	14.6	22	22.2	
	Not measured	64	62.1	58	58.6	
	Others	22	21.4	19	19.2	
Have you measured your lipid levels?	Yes	32	31.4	23	23.2	p>0.05*
	No	70	68.6	76	76.8	
Have you modified your diet as per doctor's advice?	Yes	15	93.8	14	87.5	p>0.05*
	No	0	0	2	12.5	
	Don't know	1	6.3	0	.0	
If yes, how frequently	Mostly	3	18.8	4	28.6	p>0.05*
	Sometimes	9	56.3	6	42.9	
	Rarely/never	4	25.0	4	28.6	
Did you ever forget to take any drugs?	Yes	14	87.5	13	81.3	p>0.05*
	No	2	12.5	3	18.8	
If yes, mention how many times	Never	4	28.6	3	23.1	p>0.05*
	1-3 days/month	6	42.9	4	30.8	
	1-2 days/week	3	21.4	6	46.2	
	More than 2 days	1	7.1	0	.0	
Any eye examination?	Yes	6	37.5	8	50.0	p>0.05*
	No	10	62.5	8	50.0	
Any foot examination?	Yes	4	25.0	4	25.0	p>0.05*
	No	12	75.0	12	75.0	
Always wear covered shoes when outdoors?	Yes	7	43.8	10	62.5	p>0.05*
	No	9	56.3	6	37.5	

*p>0.05 non-significant

More than half of the participants have not bothered even to check important parameter/investigation in diabetes context viz., 122 (60%) have not measured their weight, 146 (72%) have not measured their lipid levels. (Table 8).

Discussion

The ageing of population in India is likely to lead to an increase in the prevalence of diabetes mellitus. The prevalence of diabetes estimated by current study is 20.3%. Studies from various parts of India shows similar results with prevalence ranging from 13 to 25%. Results found 7% people to have impaired glucose level with every tenth person in the age group 60-69 yr is suffering from impaired glucose level. This is a pre diabetic condition, and the early identification of it can facilitate early institution of dietary and lifestyle modifications and periodic monitoring of blood glucose levels. Awareness or knowledge about diabetes was found to be 90% which is high compared to results reported from studies from India, Hong Kong and Nepal. Similar study in Saurashtra part of India reported 63% participants were aware about diabetes. Those having family member with diabetes are becoming more aware about the diabetes. In spite of having knowledge, participants were not found to have attitude in accordance with the knowledge as more than half of the participants 60% have not have not measured their weight and 72% have not measured their lipid levels. Hence, having knowledge is not enough, which is very clear from a simple fact that, more than three fourth knew about exercise and its importance for preventing controlling diabetes but half of them were never or rarely participated in moderate physical exercise. People should also have an appropriate attitude as well as behaviour.

Conclusion

Strengthening primary health care services in urban slums, with special emphasis on vulnerable population like elderly persons, is needed. Non-communicable diseases are a major cause of morbidity and mortality in this age group, and deserve special attention of policy makers and programme managers. The focus of non-communicable disease control and prevention programs should not only cater to the cure and care part of the disease in question but also should emphasise more on the behaviour change element by strengthening and improving the behavioural change communication as a part and parcel of the interventional health programs.

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