A Study of Diabetes among Inmates of Old Age Homes in Mysore City

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Introduction

The human population is graying, and with it concerns about the aged have been growing. Even as birth rates fall steeply, improved healthcare systems have contributed to unprecedented longevity levels. The challenges of taking care of the elderly now increasingly face developing nations. The boundary of old age cannot be defined exactly because it does not have the same meaning in all societies. The United Nations International Assembly on Ageing has taken 60 years as the boundary to define old age.[1] Globally, the number of older persons (aged 60 years or over) is expected to be more than double, from 841 million people in 2013 to more than 2 billion in 2050. Presently, about two-thirds of the world's elderly live in developing countries. By 2050, nearly 8 in 10 of the world's older population will live in the less developed regions.[2] India, as the second most populous country, is witnessing an "aging revolution." The major issues in India aging are: rapid growth of older segment; feminization of aging; poverty in old age; high growth of 80 + group and decline in family support base.[3]

Most people enter old age in poor health as a result of lifelong exposure to health risks, deprivation, lack of knowledge and resources for health promotion and poor access to health services. 45% of aged Indians have chronic diseases and disabilities.[4] In developing countries, these diseases are acquired at an early age and increased life expectancy forces the disease-burdened people to live the rest of their life with these chronic diseases.[5] Integration of population health promotion into the prevention and management of chronic diseases by adapting *expanded chronic care model* in the healthcare system and community will be a better perspective to improve health outcomes in the long run.[6]

The aging of the population along with changes in the family structure and shifts in inter-generational relations has brought into focus issues pertaining to the elderly in India. The interests of the elderly to spend their old age in sacred places, the migration of children in search of employment opportunities, their maladjustment in family and poverty of the elderly are the major reasons for the Indian elderly to shift to old age homes.[7]

India is considered as the diabetes capital of the world. Diabetes mellitus is very common among elderly due to age-related glucose intolerance. The prevalence of diabetes among elderly varies from 10 to 39%. A study done in old age homes of Bangalore city shows that the prevalence of diabetes is 38.7%.[8] The challenges in managing diabetes are unique in old age homes because of limited resources. Hence, the study was undertaken to know the prevalence and risk factors associated with diabetes in inmates of old age homes of Mysore city.

Objectives

To study diabetes among inmates of old age homes of Mysore city.

Methodology

A cross-sectional study was done in selected old age homes of Mysore city. The study was conducted from September 2012 to February 2014 for a period of 18 months. As per District disability and welfare office, Mysore data, 13 registered old age homes were functioning in Mysore city. Among thirteen, three were closed, one did not give the permission, and one old age home was newly started during our data collection period. As a result, ten old age homes were considered. A total of 362 inmates were residing in these old age homes. All the inmates were considered for the study. Institutional ethical clearance was taken to conduct the study. Permission was taken from the old age homes to enter the site and "informed written consent" forms were taken from both managers and inmates for their participation.

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Data was collected by interview method using a pre-tested semi-structured questionnaire, and anthropometric measurements were taken. Indirect oral interview method was used on the legal attendants of the inmates who were incapable. Information regarding present diabetic status and family history of diabetes was taken. Diabetes status was confirmed by estimation of capillary blood glucose in fasting state using Accu-Chek Active Blood Glucose Monitoring System, Roche Diagnostics GmbH, Germany. Diabetes was defined by physician diagnosis of diabetes and current use of medications for diabetes (insulin or oral hypoglycemic agents) and/ or fulfillment of criteria laid down by the WHO Consultation Group Report, i.e., capillary fasting blood glucose ≥126 mg/ dL.

Table1.Sociodemographic Profile of the Elderly in Old Age Homes

Sociodemographic characters	Frequency	Percentage
Age Groups		
60 to 70 years	103	34.1
71 to 80 years	126	41.7
>80 years	73	24.2
Sex		
Female	178	58.9
Male	124	41.1
Native place		
Rural	70	23.2
Urban	232	76.8
Religion		
Christian	5	1.7
Hindu	296	98.0
Muslim	1	0.3
Marital status		
Married separated	12	4.0
Married spouse living	62	20.5
Married widowed	168	53.6
Never married	60	19.9
Education status		
Graduate and above	70	23.2
Illiterate	76	25.2
PUC	22	7.3
Up to high school	134	44.4
Previous occupation		
Nil	9	3.0
Semi-skilled	204	67.5
Skilled	67	22.2
Unskilled	22	7.3
Source of income		
Children/ assets	94	31.1
Pension	158	52.3
Nil	50	16.6
Years living in old age homes		
<5	180	59.6
>10	25	8.3
5 to 10	97	32.1
Rx Expenditure by		
Children	63	20.9
Old age home	83	27.5
Others	25	8.3
Own	131	43.4

The unit of measurement was milligram per deciliter.[9] Status of any complications due to diabetes was assessed subjectively by taking history from the patients.

Statistical Analysis

Data were entered in Microsoft Excel spreadsheet. Descriptive statistics like frequency and proportions were calculated using R software. Categorical variables were analyzed using χ^2 test for proportions and contingency coefficient. With level of significance 5%, decisions were made.

Results

The data was collected from 302 inmates of different old age homes. Table 1 gives the sociodemographic profile of inmates of old age homes.

Among 302 inmates, 178 (58.1%) were females and 124 (41.1%) were males. Majority of inmates were in the age group of 71-80 years. 76.8% of the inmates were from urban area. 98% of the inmates were Hindus. Majority of the inmates (44.4%) had education up to high school and 25% were illiterates. Majority of the inmates 53.6% were widowed. Occupation-wise, majority of the inmates were from semi-skilled profession. 52.3% were dependent on pension (includes retirement pension, family pension, old age pension,

widow pension and disability pension), 16.6% did not have any income. Remaining 31% were dependent on children and family assets for their source of income.

59.6% of the inmates were living in the old age home for less than 5 years, 32.1% for 5-10 years and only 8.3% were living for more than 10 years. Majority of the inmates (43.4%) spent their own money for treatment expenditure, only 27.5% of the inmates received free treatment.

Diabetes mellitus was detected in 90 (29.80%) inmates. Table 2 shows among them, 19 (21.12%) were newly detected diabetes. They did not have any previous history of diabetes. Rest of the inmates knew about their diabetes status, and were on treatment for the same.

Table 3 shows the proportion of complications of diabetes among the inmates. 66.89% of them said no complications, 17.22% said do not know. Peripheral neuropathy was present in 6.29% and cardiovascular complications in 4.97% inmates.

From Table 4, it is observed that 10.59% of diabetics were obese and 7.61% were overweight. The association of obesity with different levels of body mass index is significant (p-value=0.015). The association level was 18.3%.

Table 2.Distribution of Diabetes among Inmates of Old Age Homes

Diabetes cases	Frequency	Percentage
Old cases	71	78.88
New cases	19	21.12
Total	90	29.80

Table 3.Distribution of Diabetes Complications

Diabetes complication	Number	Percentage
No complication	202	66.89
Renal disease	3	0.99
Peripheral neuropathy	6	1.99
Peripheral neuropathy, retinopathy	8	2.65
Peripheral neuropathy, cardio vascular disease	5	1.66
Retinopathy	9	2.99
Retinopathy, cardio vascular disease	2	0.67
Cardio vascular disease	8	2.65
Do not know	59	19.54
Total	302	

Table 4.Association of Body Mass Index with Diabetes

Morbidity	Levels	Obese	Normal	Overweight	Underweight	Total
Diabetes	No	62 (20.53)	73 (24.17)	42 (13.91)	35 (11.59)	212 (70.20)
	Yes	32 (10.60)	32 (10.60)	23 (7.62)	3 (0.99)	90 (29.80)
	Total	94 (31.13)	105 (34.77)	65 (21.52)	38 (12.58)	302

Chi-square value: 10.517, df: 3.00, p-value: 0.015 (significant), contingency coefficient: 0.183

Table 5.Association of Sociodemographic Characters of Inmates with Diabetes

Characteristics	Categories	Levels		Chi-square value	Df	P-value	Contingency coefficient
		Yes %	No %				
Sex	Male	14.24	26.82	2.012	1	0.156	0.089
	Female	15.56	43.38				
Place	Rural	6.62	16.56	0.012	1	0.914	0.015
	Urban	23.18	53.64				
Religion	Christian	0.33	1.33	2.586	2	0.274	0.092
	Hindu	29.14	68.85				
	Muslim	0.33	0				
Marital status	Married Separated	2.32	1.66	7.917	3	0.048	0.16
	Married Spouse Living	7.62	12.91				
	Married Widowed	15.23	40.40				
	Never Married	4.64	15.23				
Educational status	Illiterate	6.29	18.87	2.817	3	0.421	0.096
	Grad & Above	8.61	14.57				
	PUC	2.32	4.97				
	Up to High Sec	12.58	31.79				

Discussion

In the present study, 29.80% of the inmates were affected by diabetes mellitus. Prevalence of diabetes in different Indian studies varies from 8.1% by Purty in Pondicherry[10] and 15.23% by Sharma et al.[11] A multicentric study conducted by Ministry of Health and Family Welfare in collaboration with WHO showed a prevalence of 13.3%.[12]

Studies conducted in southern part of India show slightly higher prevalence of diabetes compared to national studies. In urban Bangalore, Karnataka, a study by Reddy et al. shows prevalence of diabetes to be 38.7%.[8] Another study conducted in Udupi, Karnataka, by Asadullah et al. shows the prevalence of diabetes as 36.7%.[13] A study conducted in Nagpur by Jain et al. showed the prevalence of 30.4%.[14]

Jain et al. also reported that proportion of males (50.56%) and females (49.43%) with diabetes was almost equal.[14] This study shows statistically significant association between diabetes and other sociodemographic factors like religion, place and educational status.

This study shows 10.59% of diabetics were obese and 7.61% were overweight. The association of obesity with different levels of body mass index was significant (p value=0.015). Shankar et al. reported that 27.6% of overweight elderly were diabetics. Diabetes is significantly associated with increase in BMI which correlates with the current study.[15]

Conclusion

Diabetes in India is rising in epidemic proportion. As the life expectancy is increasing, more people are into old age with chronic diseases like diabetes. Inmates of old age homes are specific group of people who require special attention regarding management of their health conditions. Diabetes is a disease which results in more complications and morbidity during old age.

This study shows a prevalence of diabetes as 29.3% among the inmates. Considerable numbers of people with diabetes are having complications. Effective treatment and management of complications is the need of the hour for these inmates. Old age homes should also take necessary steps in order to ensure that proper healthcare is provided to their inmates.

Conflict of Interest: None

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