A comparative study of geriatric and non-geriatric diabetic patients -a cross sectional hospital based study

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Abstract

Introduction: Ageing is associated with decrease in the efficacy of various physiological homeostatic mechanisms as well as increase in co-morbidities and functional disabilities. The classical symptoms of diabetes are not always apparent in older people. Elderly patients have particular needs that differ from those of younger patients with the same conditions. There are varying statistics in different age groups but no comparative studies have been done from this region.

Objectives: The objective of this study was to compare the clinical and biochemical profile of geriatric (≥60yrs) and non-geriatric (<60yrs) diabetic patients.

Materials and Method: This study population included 150 patients diagnosed with diabetes attending Out Patient Department and admitted as In-Patient in Central Referral Hospital, Sikkim. After obtaining approval from IEC and taking a written informed consent, data was collected. Thorough clinical examination was done and necessary investigations were carried out. Results were analysed using descriptive statistics and values were expressed as mean ± Standard Deviation. Comparison between geriatric (≥60 yrs.) and non-geriatric (<60 yrs.) was made. A p value of < 0.05 was considered to be statistically significant.

Results: After analysis, it was found that only 11% of geriatric patients presented with classical symptoms of Diabetes Mellitus while 60.38% of non- geriatric patients presented with the said complaints. A few atypical clinical presentations that were found only in geriatric age group were forgetfulness (6.82%), Urinary incontinence (4.55%), Delirium (4.55%).The mean PPBS value was higher in non- geriatrics whereas mean HbA1c value was higher in geriatric group. Among the complications, Peripheral neuropathy was significantly more common in geriatrics than the non- geriatrics (p= 0.000).

Conclusion: The geriatric population is a special population which may present with atypical symptoms and awareness regarding the same is of paramount importance.

Keywords: Diabetes Mellitus, Geriatrics, Non-geriatrics

Introduction

A significant proportion of the general population consists of elderly persons because of the increasing life expectancy. Ageing is associated with many diseases and Diabetes Mellitus is one of the most important problems in the elderly population. Because of their age and heterogeneity, older persons are usually excluded from randomised control trials[1] leading to non-availability of reliable data about the health problems of geriatric population in India. Current health policies do not adequately address the issue of health care in geriatric population.[2] The ability of the body to maintain glucose homeostasis is impaired with age.[3] The changes in carbohydrate metabolism in geriatric age group compounded by other age related metabolic defects results in a syndrome that is different from that as found in middle aged diabetic patients.[3] Hence the presenting symptoms in elderly diabetics may not be typical, thus the need to study the difference in clinical profile of geriatric and non-geriatric patients.

Objective

To compare the clinical and biochemical profile of geriatric and non-geriatric diabetic patients.

Materials and Method

A Cross sectional hospital based study was carried out in the department of Medicine in Central Referral Hospital (CRH), Sikkim. All patients diagnosed with diabetes mellitus attending OPD & admitted in IP in CRH during the period between May 2016 and Oct 2016 were included in the study. ADA criteria was adopted for the purpose of diagnosis. After approval from Institutional Ethics Committee, a written informed consent was obtained from the identified patients and the pro-forma was filled which consisted of patients' information including demographic characteristics, detailed history including co morbid conditions and end organ damage. A thorough clinical examination was done and investigations like FBS (Fasting blood sugar), PPBS (Post prandial blood sugar), HbA1C (Glycosylated haemoglobin), Fasting Lipid profile, Urine microalbuminurea, 12 lead Electrocardiography and 2D Echocardiography. Direct and Indirect Ophthalmoscopy along with 90 D slit lamp examination was done to diagnose diabetic retinopathy. Peripheral Neuropathy was clinically diagnosed on the basis of absent ankle jerk and/or decreased vibration sensation distally. The study population was then divided into

Geriatric (≥60yrs) and Non geriatric (< 60yrs) groups. Data were analysed using IBM® SPSS, version 22.0 (IBM Corp., Armonk, NY). Comparison between geriatric and non-geriatric groups was made. A p value of < 0.05 was considered to be statistically significant.

Table 1: Demographic data

Variables	Geriatrics (n= 44)	Non-Geriatrics(n=106)	*U, P* value
Age (years)	68 (65 -74.50)	47 (37-54.25)	-9.630, 0.000
Height (cm)	160.50 (156 -166.50)	160.50 (156 – 165)	-0.355, 0.723
Weight (kg)	57.55 (48 - 66.50)	59.00 (48.15 – 69)	0.478, 0.633
Body Mass Index (kg/m2)	22.63 (19.29 - 25.71)	22.38 (20.04 - 26.64)	-0.244, .808

Results

The total study population comprised of 150 diabetic patients. Of this, 106 were non geriatrics and 44 were geriatric patients. While evaluating the clinical presentation, it was found that 60.38% of non- geriatric patients presented with classical symptoms of Diabetes Mellitus like polydipsia, polyuria, generalised weakness, lethargy, unexplained weight loss, etc. while only 11% of geriatric patients presented with the said complaints. Cerebrovascular accidents (CVA) was also one of the common presentations and it was seen that 20.45% of the geriatric population presented with CVA while among the non-geriatrics, 14.15% presented with CVA. Among the geriatrics, 15.91% presented with infection while it was the presentation of 7.55% of non-geriatrics. Other atypical clinical presentations that were found only in geriatric age group were forgetfulness (6.82%), Urinary incontinence (4.55%) and Delirium (4.55%). Demographic data did not show any difference between the groups.

The biochemical data did not show significant difference in the two groups. There was no statistically significant difference in FBS, PPBS and HbA1c values. However, the mean PPBS value was higher in non-geriatrics whereas mean HbA1c value was higher in geriatric group. Similarly, though the values of serum Triglyceride and cholesterol was higher in geriatric age group, it was not statistically significant. There was no difference in the values of HDL and LDL as shown in Table 4. Coronary artery disease (CAD) were more in geriatric patients (34%) than the non- geriatric ones (24.5%). Among the geriatric population, CAD was significantly higher in females (46.15%) than in males (16.67%) as shown in Table 6. There was no difference in the prevalence of Hypertension between geriatric and non-geriatric patients. Microvascular complication was higher in geriatric than non-geriatric group. Microalbuminurea was seen in 47.73% of geriatric and 38.68% of non- geriatric patients. Retinopathy was seen in 52.27% of geriatric and 43.4% of non-geriatric population. Clinical evaluation showed that Peripheral neuropathy was present in 90.9 % of geriatric and only 34.3% of non -geriatrics.

Discussion

About a century ago, the ratio of geriatric to non-geriatric individual was 1:20. Presently this ratio is estimated to be 1:6.[4] There are 77 million (7.4%) elderly people in India, and this number is expected to rise to 178 million by 2030. The Indian aged population is currently the second largest in the world.[2] However, as there is no registration of elderly people at the national level no exact statistics about elderly population is available.[5] With demographic transition and population aging, diabetes in elderly is a major public health problem in India.[2] In a study done by Myung Ki et al,[6] they found that in spite of improved glycaemic control, the rate of hospitalisation was increased in geriatric diabetic patients. The profile of clinical presentation of geriatric diabetics was quite different than in non-geriatrics as shown in Table 2. This finding is similar to that as done by JD Kesavadev et al.[7] This suggested that probably either co-morbid conditions or functional disabilities and metabolic changes due to aging could be the cause of this disparity.

Table 2: Comparison of Clinical Presentation

Presentation	Geriatric n=44 (%)	Non-Geriatric n=106(%)
Classical Symptoms	11 (25%)	64 (60.38%)
CVA	9 (20.45%)	15 (14.15%)
Infection	7 (15.91%)	8 (7.55%)
Neuropathy	3 (6.82%)	1 (0.94%)
Breathlessness	1 (2.27%)	6 (5.66%)
Giddiness	1 (2.27%)	2 (1.89%)
Forgetfulness	3 (6.82%)	0 (0%)
Urinary Incontinence	2 (4.55%)	0 (0%)
Fall and injury	1 (2.27%)	0 (0%)
Decreased vision	2 (4.55%)	5 (4.72%)
Tremor	1 (2.27%)	0 (0%)
Delirium	2 (4.55%)	0 (0%)
Depression	1 (2.27%)	0 (0%)
Routine check-up	0 (0%)	1 (0.94%)
Mixed	0 (0%)	1 (0.94%)

Table 3: Comparison of glycaemic profile

Parameters	Geriatrics (n= 44)	Non-Geriatrics(n=106)	*U, P* value
FBS (mg/dl)	105.73± 21.24	105.18±2.47	-.107, 0.914
PPBS(mg/dl)	130.16 ±21.44	131.39 ± 21.2	.345, 0.730
HbA1C (%)	6.52 ±1.09	6.4±1.04	-.866, 0.387

Note * Values are non-parametric statistics, unless stated

Table 4: Comparison of Fasting Lipid Profile and Microalbuminurea

Parameters	Geriatrics (n= 44)	Non-Geriatrics(n=106)	*T,P* value
Microalbuminuria (µgm/dl)	30.09±20.75	28.86± 20.476	-.349, .727
Total Cholesterol (mg/dl)	153.14±38.25	168.66±49.95	-1.352, .176
Triglycerides (mg/dl)	119.89±28.34	131.77±45.19	-1.522, .128
High-density lipoprotein (mg/dl)	37.95±8.33	37.27±8.43	-.217, .828
Low-density lipoprotein (mg/dl)	120.86±31.93	119.34±30.51	-.037, .970

Table 5: Distribution of co-morbidities and diabetic complications

Complications	Geriatrics n= 44(%)	Non-Geriatrics n=106 (%)	X^2 value	*P* value
Hypertension	8 (18.18)	20 (18.87)	.547	.459
Coronary artery disease	15(34.09)	26(24.53)	.816	.366
Dyslipidaemia	23(52.27)	56(52.83)	.158	.691
Nephropathy	17 (38.63)	41 (38.68)	.013	.910
Retinopathy	23(52.27)	46 (43.4)	.411	.814
Neuropathy	40 (90.9)	36 (34.3)	39.782	0.000

Table 6: Distribution of complications in male and female

| Complications | Geriatric n=44 | | Non-Geriatric n= 106 | |
	Male n= 18(%)	Female n = 26(%)	Male n = 56(%)	Female n = 50(%)
Hypertension	2(11.11)	6(23.08)	9(16.07)	11(22)
Dyslipidemia	9(50)	14(53.85)	30(53.57)	26 (52)
Coronary artery disease	3 (16.67)	12(46.15)	12 (21.43)	14 (28)
Microalbuminurea	9(50)	12 (46.15)	20(35.71)	21 (42)
Retinopathy	9 (50)	14 (53.85)	21(37.5)	25 (50)
Neuropathy	15 (83.33)	25 (96.15)	16 (28.57)	20 (40)

On comparison, no statistically significant difference was found between the geriatric and non-geriatric group in terms of maintenance of FBS, PPBS, and HbA1C. But the mean PPBS value was higher in non- geriatrics whereas mean HbA1c value was higher in geriatric group. This is similar to the previous study done by R Shastri et al[2] who reported a better short term glycaemic control in the geriatric population. But an earlier study from the BLSA (Baltimore Longitudinal Study of Aging)[7] group found that PPBS values were significantly higher in geriatric age group than the young and the middle aged. Though it is well recognised that there is impairment of glucose tolerance with advancing age, it appears that deterioration of glucose tolerance is not always an inevitable concomitant of aging.[7]

Co-morbidities and macrovascular as well as microvascular complications were found to be more in geriatric age group though it was not statistically significant. There is a progressive decrease in number of functioning nephrons with normal aging.[8] There is an increase in prevalence of diabetic nephropathy in geriatric age group.[9] However, we could not establish any such relation in our study. Surprisingly, percentage of patients with Hypertension (HTN) were almost same in both the groups whereas previous studies as done by R Shastri et al[2] reported higher percentage of HTN in geriatric age group. Significantly higher number of female patients were hypertensives in both the groups, more so in geriatrics. 23.08% of geriatric females were hypertensives whereas only 11.11% of male geriatrics were hypertensives. The ratio of non- geriatric female hypertensives to non- geriatric male hypertensives was 22%: 16.07%.This finding is similar to that of the study done by R Shastri et al[2] and Kannan L et al.[10] However,

studies done by Shah et al[11] and Rama W et al[12] have reported a higher percentage of HTN in men. Coronary artery disease was more in geriatric females than in males. Retinopathy was more in geriatrics and was observed in 52.27% of geriatric population as against 21% as reported by H Hirvelaet al[13] and 7.18% only as reported by XIN LI et al.[14] Severity of peripheral neuropathy increases with increase in age,[15] In our study, peripheral Neuropathy was seen to be present in significantly higher number of geriatric patients as compared to non- geriatric. This finding is similar to the study as done by Lili Husniati Y.[16]

Conclusion

The geriatric population is a special population which may present with atypical symptoms and awareness regarding the same is highly important. Significantly higher number of geriatric diabetic patients presented with non-classical symptoms of diabetes mellitus. However, there was no significant difference in the glycaemic profile of geriatric and non-geriatric patients. The frequency of macrovascular and microvascular complications were also found to be almost similar in both the groups. Of the microvascular complications, Peripheral Neuropathy was significantly more in geriatric patients.

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