Diabetes in older adults: experience from a rural community in south-east Nigeria

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M M Mezie-Okoye

Abstract

Diabetes is increasing globally with low- and middle-income countries bearing the greatest burden and the older population most affected. This study sought to highlight the problem of diabetes among older adults who participated in a health programme in a rural community. Fasting blood glucose levels and blood pressure of 147 people, aged between 40 years and above, in a rural community in south-east Nigeria were measured. The mean age of participants was 62±10y (1.SD) Thirty-seven (25.2%) were diabetic, 16 (43%) of which were undiagnosed. Most (67%) were aged 50 to 69 years. Twelve (8.2%) had impaired fasting glycaemia (IFG), of which 83% were aged 60 to 79 years. Male gender was moderately associated with the risk of diabetes, while family history was strongly associated. Twenty-five (67%) of the 37 diabetic patients were hypertensive, and only one (5%) of the 21 with known diabetes had a fasting glucose <7.0 mmol/L. This report showed a high prevalence of undiagnosed diabetes and impaired fasting glycaemia among these participants in a rural health programme. There is a strong implication for robust studies to validate these findings and an urgent need to improve access to healthcare for rural dwellers.

Introduction

Type 2 diabetes continues to increase in every country of the world, with the low- and middle-income countries bearing the greatest burden.[1–6] Diabetes is a chronic debilitating and costly disease with severe complications ,and poses serious challenges to the achievement of the Millennium Development Goals (MDGs).[7] The epidemic is driven by the combined effects of population ageing, urbanisation, increasing obesity, and inactivity.[1] Poor knowledge about diabetes prevention and control is also a contributing factor in Nigeria.[8] Prevention, early diagnosis and management of diabetes will delay severe complications, hence reducing of the burden of the disease.

Dr M M Mezie-Okoye,
Department of Preventive and Social Medicine, College of Health Sciences, Faculty of Clinical Sciences, University of Port Harcourt, Nigeria.
Correspondence to: Dr M M Mezie-Okie, PO Box 167, Uniport Post Office, Rivers State, Nigeria
Email: meg_mezieokoye@yahoo.co.uk

Studies have shown that significant complications are present at diagnosis and for years before diagnosis.[9,10] Chronic hyperglycaemia causes complications like nephropathy, retinopathy or neuropathy; ischaemic heart diseases, stroke or peripheral vascular disease.[2,11,12] Intermediate hyperglycaemia (pre-diabetes), where the blood sugar is high but not as high as in diabetes is a risk factor for diabetes[13] and without intervention, a third of those with impaired fasting glucose (IFG) and two-thirds with impaired glucose tolerance (IGT) will develop diabetes within 6 years.[10] People in pre-diabetic states (IFG and IGT) have increased risk of cardiovascular disease compared with those with normal blood glucose levels. [14]

The number of people with diabetes rose from 284.6 million in 2010 to 366 million in 2011 and to 371 million in 2013.[1,2,] Globally, half of these people are undiagnosed, while the disease remains largely undiagnosed in most countries in sub-Saharan Africa,[15, 16] It is estimated that there are currently 9 million diabetic patients in Africa and this figure will double in the next 30 years.[2] Individuals who are unaware they have the disorder are at very high risk of chronic complications.[17]

There is limited information on the prevalence of undiagnosed diabetes and pre-diabetes state in Nigeria. Reports have shown that prevalence ranged between 2.2% to 6.8%.[18–21] Nigeria has the highest number of diabetic patients in Africa.[12] A study among adults in southern Nigeria showed that most (41%) of those with diabetes were previously undiagnosed.[21] Diabetes presents a huge cost to individuals, families, and society. The burden is related costs to the health system, premature deaths, and time spent by family members in caring for patients, thus posing a great threat to the economic development of Africa and indeed Nigeria.

This report sought to highlight the serious problem of diabetes in the older adults in a rural community.

Patients and methods

Setting

A 'Health Fair' was carried out for members of a community in Anambra State, south-east Nigeria, in December 2006. About 5% of the participants were non-residents in the community who had come to celebrate Christmas with their families. The programme aimed at educating people on healthy eating habits and lifestyle changes, diagnosis and treatment of non-communicable diseases. The only health facility in the community provides only antenatal and delivery services to women. The nearest hospital is about 8 km from the community. The commu-

nity has about 10 000 people with a significant proportion of elderly people.

Study population
People aged 40 years and above were studied because of their greater risk of diabetes. This was a cross-sectional study.

Data collection
Fifteen undergraduates from the community who were studying medicine, pharmacy, laboratory technology or nursing were trained on blood pressure (BP) measurement using an automatic digital device (OMRON HEM-711AC) and blood glucose measurement using ACCU-CHEK ACTIVE. Record keeping and dispensing of drugs were carried out by two doctors, two pharmacists and a pathologist. Three other specialist physicians including a cardiologist participated in the clinical assessment and treatment.

Two BP measurements were taken, first by the assistants and about 5 to10 minutes later by the attending doctor. Fasting glucose levels were also estimated before referral to the doctor for clinical assessment. During the history taking, information was sought on whether the participant had ever been told by a doctor that he/she was hypertensive or diabetic, and whether there was a family history of diabetes or hypertension in parents or siblings.

Hypertension was defined using the JNC 7 classification,[22] as those who have systolic blood pressure ≥140 mmHg or diastolic pressure ≥90 mmHg, or having been told by a medical doctor that they were hypertensive. Diabetes was defined as fasting blood glucose (FBG) >7.0 mmol/L and IFG as a FBG of 6.1 to 6.9 mmol/L.[3]

Data analysis
Data was analysed using SPSS version16 and presented using frequency tables. Associations were tested using Chi-square with a p- value set at <0.05, at 95% confidence interval. Risk ratio was determined using Odds Ratio (OR) at 95% confidence intervals.

Results

Of the 147 participants, 62 (42%) were male while 85 (58%) were females, with a ratio of 1:1.4. Mean age of participants was 62, SD ± 10. Of the 37 (25%) who had diabetes, 16 (43%) were undiagnosed and 21 (57%) knew they had diabetes. Of these, 36 had a FBG ≥7.0 mmol/L, while one was normoglycaemic (FBG <6.1 mmol/L). Of the diabetic group, 21 were male and 16 female (OR 2.21, CI 1.04–4.68, p=0.038). The prevalence of diabets at different age groups is shown in Table 1, and of IFG in Table 2. There were 12 with IFT (8.2%) – eight female and four males. There were 41 (28%) with a family history of diabetes, significantly associated with the presence of diabetes (OR 3.05, CI 1.39–6.65, p=0.005. Of the 37 with diabetes, 25 (68%) had hypertension (OR 0.68, CI 0.30–1.52, p=0.35). Three (8%) of the diabetic group presented with complications of erectile dysfunction (ED), stroke, and toe gangrene respectively. Table 3 summaries the prevalence of risk factors in the group.

Age (y)	Number (%)
40–49	2 (1.4%)
50–59	12 (8.2%)
60–69	13 (8.8%)
70–79	19 (6.8%)
Total	37 (25.2%)

Notes:
1. Total number studied was 147.
2. Though the prevalence of diabetes increased with age group generally, this was not significant (p=0.738).

Table 1 Prevalence and age distribution of type 2 diabetes

Age (y)	Number (%)
40–49	0 (0%)
50–59	1 (0.7%)
60–69	6 (4.1%)
70–79	3 (2.0%)
>80	1 (0.7%)
NR	1 (0.7%)
Total	12 (8.2%)

Notes:
1. Total number studied was 147.
2. NR = age not recorded.
3. The prevalence of IFG tended to increase with age, this was not significant (p=0.738).

Table 2 Prevalence and age distribution of impaired fasting glycaemia (IFG)

Risk factor	Number (%)	OR	CI	p value
1. Age (y)				
<60	14 (9.5%)			
>70	23 (15.7%)			
Total	37 (25.2%)	0.69	0.31–1.51	p=0463
2. Gender				
Male	21 (14.3%)			
Female	16 (10.9%)			
Total	37 (25.2%	2.21	1.04–4.68	p=0.038
3. Family history				
Yes	17 (11.6%)			
No	20 (13.6%)			
Total	37 (25.2%)	3.05	1.39–6.65	p=0.005
4. Hypertension				
Yes	25 (17.0%)			
No	12 (8.2%)			
Total	37 (25.2%)	0.68	0.30–1.52	p=0.347

Notes:
1. Total number studied was 147.
2. OR = Odds Ratio
3. CI = Confidence Interval

Table 3 Analysis of diabetes-related risk factors

Discussion

Comprehensive data on diabetes and IFG (pre-diabetic state) is scarce in Nigeria, more so in the older population. The idea of early diagnosis is to reduce the health and economic burden of the disease by minimising complications. Again, detection of the pre-diabetic state may prevent development of the disease by modification of behaviour and lifestyle. This study, though limited by its non-probability sampling method, showed that diabetes is a major health problem in the older adults in this community and probably other rural communities. This calls for further investigations to establish the burden of diabetes in rural communities where most of the older population reside.

A comparison with studies on the prevalence of diabetesis difficult because of the different designs and different criteria used for diagnosis. Again there is a paucity of studies on the older age group in Africa, including Nigeria. This study, like previous studies,[16,17,23] showed that the prevalence of diabetes increased with age but was not statistically significant probably because of the small sample size. Males were more likely to have diabetes than females as was shown by Amoah et al in Ghana[16] and Nyenwe et al.[21] Our study showed a male OR of 2.2 in favour of males developing diabetes, similar to the finding (OR=2.5) of Muel et al in Congo.[24] However, Okesina[19] and Kadiri et al[20] reported no difference in gender prevalence, while Oyegbade et al[25] reported a higher prevalence in females. This shows that generally, that there is no definite sex pattern. The prevalence of undiagnosed diabetes is high worldwide[1] and more so in sub-Saharan Africa. In this study it was high, consistent with that found in other studies from sub-Saharan Africa.[2,21,26]

IFG is becoming relevant because of its contribution to cardiovascular complications of type 2 diabetes, even before the disease becomes symptomatic. Thus the early identification of people with IFG may prevent the development of the disease and also minimise the risk of complications. The prevalence of IFG was similar (8.2% Vs 6.1%) to finding from Guinea,[17] lower (16.9%) than that reported by Sabir AA et al,[26] and higher (1.5%) than the finding from a rural South African country.[23] The differences could be because of different populations studied and ethnic differences. Most (83%) of those with IFG were >60 years of age and there was no gender difference, unlike the South African[23] study where prevalence was greater in females. Unwin et al[14] reported the prevalence to be more in males than females.

Our findings showed that most (68%) of the diabetic patients had hypertension, which colloborates with a multicentre survey in Nigeria,[27] and a Jordan study.[28] Patients with both diabetes and hypertension are at high risk of both micro- and macro-vascular complications such as nephropathy and retinopathy, which increase morbidity and mortality of the disease.

Family history was present in 28% similar to 23%[29] and 27.3% reported by Puria et al and Erasmus et al.[30] Family history was a significant risk factor for diabetes in this community, as may be expected. This is comparable with findings from South Africa.[23] Family history was highest among siblings, followed by mothers, while Erasmus et al[30] showed it was highest in mothers followed by siblings. This difference could be due to patients having better knowledge of their siblings' health status than that of their parents.

In conclusion, this report has shown a high prevalence of undiagnosed diabetes and IFG, moderate association and strong association of gender and family history respectively with diabetes and poor control of the disease. There is urgent need to validate these findings through a more robust community-based survey, improve access to health services in the communities, and develop policies for prevention and control of diabetes in Nigeria. Modification of life style behaviour and early diagnosis through targeted screening may save the enormous economic and social burden of the disease.

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