ABSTRACT

BACKGROUND

The Fulani are a largely nomadic people known for covering great distances on foot with a resulting lean physique and presumably low incidence of diabetes mellitus. However, with modernization some Fulani have adopted sedentary lifestyles, western diet and white collar occupations which are risk factors for diabetes mellitus and related non-communicable diseases. The prevalence of diabetes mellitus is rising worldwide with urbanization and sedentary lifestyle being major risk factors. There is paucity of data on the glucose tolerance status among the Fulani ethnic group. The objective of this study was to determine the prevalence and lifestyle, anthropometric and biochemical risk factors for glucose intolerance among the Fulani ethnic group in Northern Nigeria.

RESEARCH DESIGN AND METHODS – Seven hundred and eighty-two subjects were recruited for the study using a multi-stage sampling method. Three hundred and ninety-three subjects were rural dwellers while three hundred and eighty-nine were urban dwellers. Using a modification of the WHO STEPS, information on socioeconomic and demographic data and risk factors for glucose intolerance (exercise, diet, alcohol consumption and cigarette smoking) was obtained by means
of a questionnaire administered by a trained assistant. Each subject was briefly examined and blood pressure and anthropometric measurements including height, weight, waist and hip circumference made. Casual or fasting plasma glucose was obtained in all subjects while plasma lipids and insulin and oral glucose tolerance were assessed in a selected group of 100 subjects. Glucose intolerance was defined using WHO criteria while insulin resistance was estimated using HOMA-IR. Raw data were entered into a spreadsheet (Microsoft Excel 2003) and exported to Epi-Info version 3.3.2 where necessary. Statistical analysis was performed using Epi-Info version 3.3.2. Significance of differences between group means was assessed using Student’s t – test while $\chi^2$ statistic was employed to determine significance of results of comparison of proportions between groups. Average values are presented as mean (SD). Level of statistical significance is set $p<0.05$.

**RESULTS** – Of the 800 subjects recruited into the study, 782 subjects [376(48.1%) females and 406(51.9%) males] completed the study, giving a response rate of 97.7%. There was no significant difference between the proportions of males and females ($p>0.05$). The mean (SD) age of the rural subjects was 38.5(13.6) years and that of the urban was 39.4(14.2) years ($p= 0.45$). The mean (SD) weight of the urban subjects [65.9(12.9)] kg was significantly higher than the rural subjects [58.5(9.7)] kg ($p<0.05$). The mean (SD) BMI of the urban subjects [24(4.2)] kg/m²
was significantly higher than the rural subjects [21.9(3.1)] kg/m² (p<0.05). The mean (SD) waist circumference of the urban subjects [84.3(10.6)] cm was significantly higher than the mean waist circumference of the rural subjects [78.6(8.7)] cm (p<0.05). The risk factors for diabetes mellitus were higher in the urban than the rural subjects. The major risk factors for diabetes mellitus and glucose intolerance from this study were increased age and obesity. The mean (SD) FPG of the urban subjects [5.37(1.8)] mmol/l was significantly higher than the rural subjects [5.02(0.59)] mmol/l (p<0.05). The urban subjects had higher plasma post glucose load [6.5(1.6)] mmol/l than the rural subjects [6.3(1)] mmol/l but not statistically significant (p= 0.45). The mean fasting plasma insulin levels were significantly higher in the urban [16.1(15.9)] µU/ml than the rural subjects [13.2(13.6)] µU/ml (p=0.041). The mean HOMA-IR level was significantly higher in the urban [4.22(5)] than the rural subjects [2.32(2.5)] (p=0.024). The prevalence of type 2 Diabetes Mellitus in Sokoto was 2.7% with urban and rural populations having prevalence rates of 4.6% and 0.8% respectively. The prevalence of impaired fasting glycaemia was 14.9% significantly higher in urban (16.9%) than in rural (12.7%) locations (p = 0.002). The prevalence of insulin resistance was 23% with urban and rural populations having prevalence rates of 30% and 16% respectively.
CONCLUSIONS - The prevalence of diabetes mellitus in the Fulani of North western Nigeria was higher than the overall previous national prevalence indicating increasing prevalence of diabetes mellitus in Nigeria. The prevalence of glucose intolerance and its risk factors were higher in the urban Fulani than the rural Fulani. The prevalence of insulin resistance was higher in the urban community than the rural community. There is need for prospective studies in the glucose intolerant subjects and insulin resistant subjects in order to monitor for the development of diabetes mellitus.

The results underline the need to increase public screening and to emphasize the value of lifestyle modification toward traditional African lifestyle.