Original research

Type 2 diabetes in Mauritania: Prevalence of the undiagnosed diabetes, influence of family history and maternal effect

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ABSTRACT

Aim: We estimated the prevalence of undiagnosed diabetes, analyzed the influence of family history on the occurrence of T2D and evaluated its aggregation pattern in the Mauritanian population.
Methods: The prevalence of unknown diabetes was obtained using data compiled from 1278 Mauritanian adults applying a questionnaire and fasting serum glucose tests. Detailed family history of diabetes and clinical characteristics were gathered from 421 T2D patients.
Results: The prevalence of undiagnosed diabetes was $4.7 \pm 1.2\%$ in the studied population (3.1% in men and 6.4% in women). 27% of T2D patients reported at least one relative with diabetes. Association between family history and diabetes was higher among first degree compared to second degree relatives ($p = 0.003$). We observed more probands with an affected mother than those who have a father with diabetes ($p = 0.002$), suggesting a preferential maternal effect which did not extend to second degree relatives.
Conclusions: These results show that the prevalence of diabetes in the Mauritanian population could be higher than currently thought. Family history screening may be used in the management of this condition in Mauritania.

1. Introduction

Diabetes was commonly thought to affect mainly wealthy populations in industrialized countries. This view has now changed as numerous reports showed that the number of diabetes patients was growing in the third world [1]. Of 366 million people with diabetes, more than 80% were in low and middle-income countries against less than 40% in 1995 [2]. Despite the increasing data on diabetes epidemiology in Africa over the past few years [3], the prevalence of this condition in our continent remained uncertain due to cultural causes and
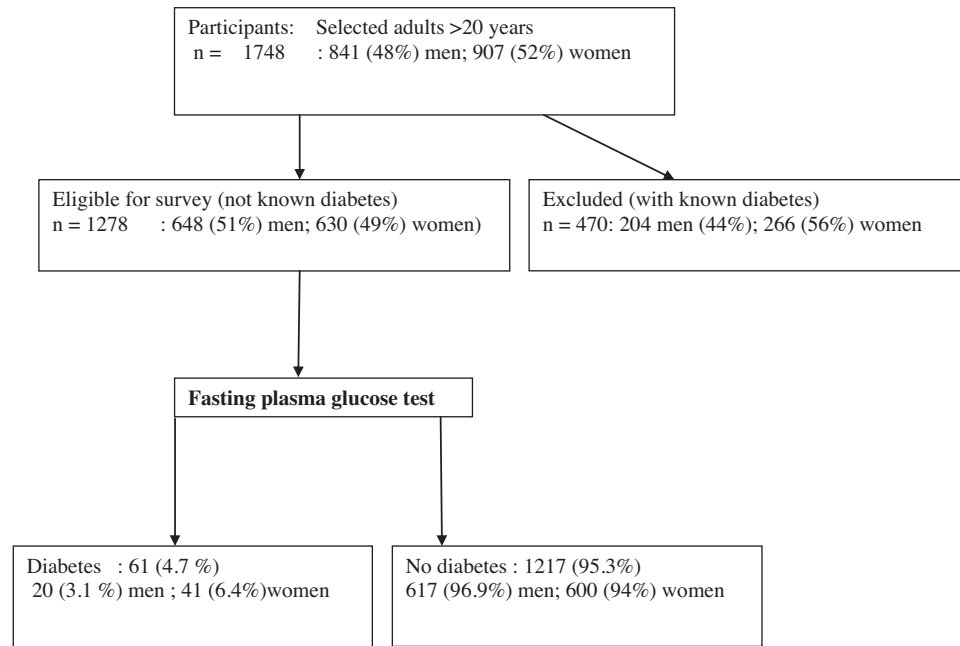
Fig. 1 – Flow chart showing participation and results of screening.

the limited budget affected to health services [4]. It was estimated that due to the combined effect of fast rate urbanization and changing demography, the number of patients with diabetes should double by 2030 in sub-Saharan Africa [2]. This rise has contributed further to the burden of the traditional infectious diseases and natural catastrophes common in these countries.

Besides, about 80% of diabetes cases in the continent were still undiagnosed [2] and little was known on familial aggregation and inheritance pattern of diabetes in the African populations [5].

The aim of this study was to evaluate the prevalence of undiagnosed diabetes, investigate the influence of family history on T2D and analyze its parental effect in the Mauritanian population.

2.   Subjects and methods

2.1.   Prevalence of undiagnosed diabetes

Data were compiled from a survey conducted by the Ministry of Health and the University of Nouakchott/Mauritania and approved by the national ethic committee. At each venue, adult residents were invited, through announcements by local health authorities, to attend a morning screening session. In the prevalence study, we randomly enrolled 1748 participants from six of the most populated regions of the country: Gorgol (383), Trarza (592) in the South, Inchiri (80), Tiris (182) in the Center and Adrar (206), Nouadhibou (305) in the North. The global population of the visited regions (0.92 millions inhabitants) accounted for 42% of the total population according the latest census (6). Information (name, age, sex and diabetes status) were gathered from each respondent after his informed consent in a short questionnaire followed by fasting

blood glucose measurement. Known diabetes patients were defined as individuals who gave a positive response to the question of whether they had ever been told by a health professional that they had diabetes. These patients were instructed to identify themselves and excluded if they provided a prescription from their doctor showing that they were under diabetes medication. As a result, previously undiagnosed diabetes was assessed in 1278 Mauritanian adults aged above 20 years with no known diabetes (Fig. 1). Among these subjects, new patients were first screened based on diabetes symptoms such as polyuria, unexplained weight loss, polydipsia plus fasting plasma glucose (FPG) measurement using capillary blood glucose testing after a fasting time of at least 9 h. A drop of blood was taken from fingertip using a special needle and placed on testing strip which was then inserted in a calibrated glucometer with digital display. Subjects with a FPG above 1 g/l were then asked to have a fasting serum glucose test by spectrophotometry for confirmation. Only patients from both genders, aged 20 years and above whose FPG value was >7.0 mmol/l (1.26 g/l) by this test were included in the survey. Pregnancy and foreign residents were excluded. This protocol was approved by the national ethic committee.

2.2.   Family history of type 2 diabetes

As the purpose of the prevalence survey was only to assess the frequency of unknown diabetes in the adult Mauritanian population, the invited population was told that the questionnaire will be brief and consequently it did not extend to the family history of the participants. The subjects (known and new patients) identified in that survey were therefore not included in the family history study as the relevant data were not collected.

FHD and inheritance pattern were instead investigated using data gathered from 609 known type 2 diabetes patients