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Diabetes screening in Basrah, Iraq: A population-based cross-sectional study

Abbas Ali Mansour [a,*], *Header Laftah Wanoose* [b], *Ibrahem Hani* [c], *Akeal Abed-Alzahrea* [d], *Hameed Laftah Wanoose* [e]

[a] *Department of Medicine, Basrah College of Medicine, Hattin Post Office, P.O. Box 142, Basrah 42002, Iraq*
[b] *Al-Kas Primary Health Care Center, al-Madina, Basrah, Iraq*
[c] *Talha Primary Health Care Center, al-Madina, Basrah, Iraq*
[d] *Om-Al-Shwage Primary Health Care Center, al-Madina, Basrah, Iraq*
[e] *Department of Medicine, Al-Faiha Hospital, Basrah, Iraq*

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ABSTRACT

Background: Noncommunicable diseases are going to be the major challenge to public health in the Eastern Mediterranean area after the control of infectious diseases and malnutrition. The aim of the present study is to assess the prevalence of abnormal glycemia {diagnosed diabetes mellitus, previously undiagnosed diabetes and impaired fasting plasma glucose (IFG)} in adult non-pregnant population 20 years of age and older in Basrah, Southern Iraq using American Diabetes Association (ADA) criteria.

Methods: Cross-sectional population-based study to screen for diabetes in al-Madina a rural area located 100 km to the north of the Basrah. The study samples were villages residence, intervened at home during vaccination program of their children for the period of April and May 2007. New diabetes diagnosis was based on fasting plasma glucose (FPG) equal or more than 126 mg/dl (7.0 mmol/l) on two occasions. Impaired fasting glucose (IFG) or prediabetes used for people whose FPG ranged from 100 mg/dl (6.1 mmol/l) to125 mg/dl (6.9 mmol/l).

Results: Total survey sample was 3176 (43.2% males and 56.8% females). Mean age of 43.17 ± 16.37. The overall prevalence of undiagnosed diabetes was 2.14%. People with known diabetes constituted 5.29%. Combined prevalence of new and known diabetes was 7.43%. IFG was seen in 2.02%. Those with abnormal glycemia (diabetes and IFG) constitute 9.45%. Previously undiagnosed diabetics constitute 28.81% of all diabetics in this study.

Conclusion: This study provides the first baseline data on diabetes mellitus and IFG in Basrah, Iraq. The prevalence was within the wide range of diabetes in Middle East.

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Noncommunicable diseases are going to be the major challenge to public health in the Eastern Mediterranean area after the control of infectious diseases and malnutrition [1]. Partly this fact is due to rapid aging of the developing world's populations, progressive urbanization and socioeconomic transformation and changes in nutritional patterns experienced over the past few decades.

The International diabetes federation (IDF) recommend decision for screening for diabetes should be based on the prevalence of undiagnosed diabetes and on the resources

* *Corresponding author*. Tel.: +964 7801403706; fax: +964 40 420388.
E-mail address: aambaam@yahoo.com (A.A. Mansour).
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available to conduct the detection programme and treat those who are detected [2]. Screening for diabetes will identify individuals with lesser degrees of hyperglycaemia who may benefit from interventions to prevent or delay progression to diabetes, and to prevent cardiovascular disease [2].

For diagnosing diabetes, the American Diabetes Association (ADA) recommends the use of fasting plasma glucose (FPG), because of its simplicity and economical aspect [3,4]. The use of oral glucose tolerance test (OGTT) for diagnostic purposes in clinical practice was discouraged for several reasons (e.g., inconvenient to administer, time-consuming, relatively expensive, and unpleasant for patients, less reproducibility, greater cost, high variability and low specificity [5–7].

There was only one study on the prevalence of diabetes mellitus in Iraq dated back to 3 decades ago in the PubMed on a village called Al-braja in the Shatt al-Arab district, Basrah, Southern Iraq [8]. The limitation of that study was the small sample (228 people), with enrollment of children aged 15 years and most of presumed new diabetes were having classic symptoms of diabetes. Nevertheless the study proposes 5% prevalence of diabetes in the study sample.

The aim of the present study is to assess the prevalence of abnormal glycemia {diagnosed diabetes mellitus, previously undiagnosed diabetes and impaired fasting plasma glucose (IFG)} in adult non-pregnant population 20 years of age and older in Basrah, Southern Iraq using ADA criteria [4].

1. Research design and methods

Cross-sectional population-based study to screen for diabetes in al-Madina district in Northern Basrah. The study was carried out in al-Madina (3 villages, Al-Kas, Om-Al-Shwage, and Talha) a rural area located 100 Km to the north of the Basrah (Fig. 1). Participants selected randomly using a simple random sampling. The study samples were villages residence, intervened at home during vaccination program of their children for the period of April and May 2007, where home program of MMR vaccination done at home for children below 5 years of age in all Iraq. The Study was a household survey carried out by trained physicians.

Fig. 1 – Basrah map.

Table 1 – Demographic characteristics of the study populations

	Number (%)
Male	1372 (43.2)
Female	1804 (56.8)
Age year (mean ± S.D.)	43.17 ± 16.37
Hypertension	612 (19.26)
Family history of diabetes	544 (17.12)
Total	3176 (100)

Table 2 – Diagnostic category of diabetes

	Number (%)
Normal fasting plasma glucose	2868 (90.55)
Known diabetes	168 (5.29)
New diabetes	68 (2.14)
Impaired fasting plasma glucose	64 (2.02)
All diabetes	236 (7.43)
Abnormal glycemia	300 (9.45)
Total	3176 (100)

Exclusion criteria were age less than 20 years, pregnancy, and a history of recent surgery, trauma, or illness. We choice this district from Basrah because this area were stable with no extensive migration that face Iraq now a day. All subjects provided written informed consent. Each individual was screened only once. Each person involved in this study was interviewed using special questionnaire including, age, history of diagnosed diabetes before, hypertension on medications, family history of diabetes (positive if father, mother, sister, brother sons, daughter were diabetics). Patients with known diabetes completed the questionnaire but did not proceed with the blood tests. Casual fingerpick capillary blood glucose level determined by the physician using Accu-Chek Active meter, Roche Diagnostics Corporation, Indianapolis. If the capillary blood glucose was 140 mg/dl (7.8 mmol/l) or more, the person FPG test was checked on a different day. This cutoff point used according to ADA [7]. FPG was measured by a glucose oxidase method (Diagnostic Chemicals reagent kit). Fasting is defined as no caloric intake for at least 8 h. New diabetes diagnosis was based on FPG equal or more than 126 mg/dl (7.0 mmol/l) on two occasions [4]. Person refuse to do FPG twice on a different days was also excludes later. Impaired fasting glucose (IFG) or prediabetes used for people whose FPG ranged from 100 mg/dl (6.1 mmol/l) to125 mg/dl (6.9 mmol/l) [4].

2. Results

Details of the participants are shown in Table 1. Total survey sample was 3176 (43.2% males and 56.8% females). Mean age of 43.17 ± 16.37. Hypertension was seen in 19.26% and 17.12% gave positive family history of diabetes mellitus.

The prevalence of undiagnosed type 2 diabetes and IFG (prediabetes) are shown in Table 2. The overall prevalence of undiagnosed diabetes was 2.14% (Fig. 2). People with known diabetes constituted 5.29%. Combined prevalence of new and known diabetes was 7.43%. IFG was seen in 2.02%. Those with

Table 3 – Age-specific and age-standardized prevalence of type 2 diabetes and impaired fasting plasma glucose by sex

	Men			Women			Both sexes		
Age group (years)	Type 2 diabetes number (%)	IFG number (%)	Abnormal glycemia number (%)	Type 2 diabetes number (%)	IFG number (%)	Abnormal glycemia number (%)	Type 2 diabetes number (%)	IFG number (%)	Abnormal glycemia number (%)
20–39	16 (18.18)	12 (50.00)	28 (25.00)	49 (33.10)	16 (40.00)	20 (10.63)	20 (8.47)	28 (43.75)	48 (16.00)
40–59	48 (54.54)	4 (16.66)	52 (46.42)	92 (62.16)	12 (30.00)	104 (55.31)	140 (59.32)	16 (25.00)	156 (52.00)
≥60	24 (27.27)	8 (33.33)	32 (28.57)	52 (35.13)	12 (30.00)	64 (30.04)	76 (32.20)	20 (31.25)	96 (32.00)
Total	88	24	112	148	40	188	236	64	300

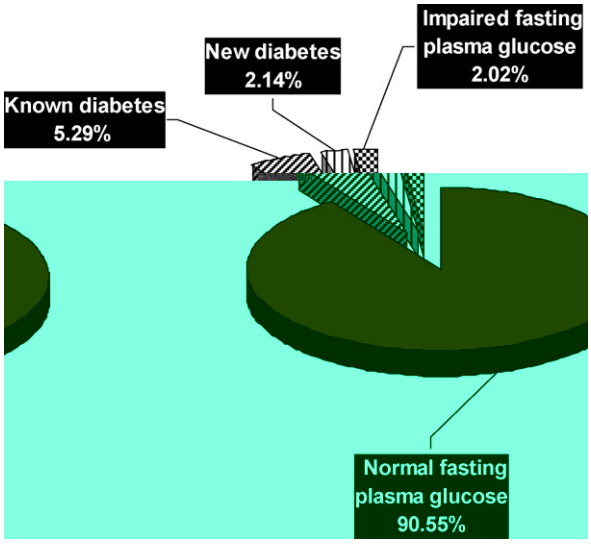

Fig. 2 – Diagnostic category of diabetes.

abnormal glycemia (diabetes and IFG) constitute 9.45%. Previously undiagnosed diabetics constitute 28.81% of all diabetics in this study.

Highest prevalence of abnormal glycemia and diabetes was seen in age range 40–59 years (Table 3) in both sexes. While the highest prevalence of IFG was seen in age range 20–39 years. Diabetes and abnormal glycemia was more in females.

3. Discussion

This study provides the first baseline data on diabetes mellitus and IFG in Basrah, Iraq. The overall prevalence of undiagnosed diabetes in our study was 2.14%. People with known diabetes constituted 5.29%. Combined prevalence of new and known diabetes was 7.43%. IFG was seen in 2.02%. Those with abnormal glycemia (diabetes and IFG) constitutes 9.45%.

Middle East prevalence data of diabetes varies. The prevalence rate of diabetes in patients aged 20 years at the end of 1990 was 3.8% in Libya [9]. In 1993 the combined prevalence of diagnosed and undiagnosed diabetes in the Egyptian population 20 years of age was 9.3% [10], and 9.8% in rural Palestinian population age 30–65 years [11]. The overall prevalence of diabetes in adults in Saudi Arabia is 23.7% in 2004 [12] and in Lebanon it was 15.8% [13].

In this study previously undiagnosed diabetes constitutes 28.81% of all diabetics which is nearly similar to that of Saudi Arabia figure of 27.9% [12]. Most of the epidemiological studies have shown that as many as 30–50% of type 2 diabetic patients were not diagnosed previously in Europe [14] and 60–90% in Africa [2,15,16].

4. Conclusions

This survey found the prevalence of diabetes to be 7.43% in Basrah, Southern Iraq. Those with abnormal glycemia (diabetes and IFG) constitute 9.45%. About 28.81% of the diabetics were previously undiagnosed. The prevalence was within the wide range of diabetes in Middle East.

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Conflict of interest

The authors state that they have no conflict of interest.

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