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Systematic Review Article

OVERWEIGHT, OBESITY AND GLYCEMIC CONTROL IN DIABETICS AT THE PROVINCIAL REFERENCE CENTER FOR DIABETES

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Abstract

Introduction: Diabetes is defined as a disorder in the assimilation, use and storage of sugars provided by food, its management is ensured by monitoring overweight and obesity and regular glycemic control.

Methods: The study took place over a period of one year from January to December 2015.The evaluation of overweight and obesity was carried out by calculating the Body Mass Index, weight and height were measured according to the recommendations of the World Health Organization (WHO), Glycemic control was performed by blood analysis of glycosylated hemoglobin and fasting blood glucose.

Results: The age range of patients is between 8 months and 80 years, with a dominance of diabetics from urban areas (74%) compared to those from rural areas (26%). Overweight affects all of this population. The average BMI of women tends towards obesity (IMC≈30): (29.21 Kg / m 2 ± 3.1) for gestational diabetes and (29.15 Kg / m 2± 3.2) for type 2 diabetes. The glycemic control values are above the norms. The difference between the values of glycosylated hemoglobin between men (8.5 7% ± 2.6) and women (8.1% ± 2.3) is not significant (P> 0.05)

Conclusion:All diabetics have BMI and glycemic control values above the norms. In-depth research is needed on these diabetics in order to establish an urgent program of remediation.

Keywords: Diabetes, prevalence, BMI, overweight, Glycosylated hemoglobin, fasting blood sugar

Introduction

Diabetes is a major public health problem due to its increasing prevalence more than 356 million people in the world have diabetes, this figure is likely to be doubled by the year 2030. In Morocco, several studies have shown that the prevalence of diabetes is 6.6%, or more than a million and a half Moroccans in 2010; according to JE. Shaw et al in 2010 [3] this figure will reach 2.5 million by 2030. Diabetes by definition can be grouped into two major types: type 1 diabetes also called insulin-dependent diabetes which is caused by the destruction of beta cells in the pancreas, hence the inability of the affected person to secrete insulin [4]; type 2 diabetes, also called diabetes mellitus, which is characterized by resistance to insulin and which results in a chronic rise in the concentration of glucose in the blood (hyperglycemia) [5]. Indeed, there are other forms of diabetes, such as gestational diabetes, which can be transient and linked to insulin resistance during pregnancy but can also persist after pregnancy. [6]. In the majority of cases, diabetes is associated with a set of abnormalities grouped together under the term metabolic syndrome, which represents a major risk of morbidity [7 , 8]. Diabetes is incurable, the absence of an effective treatment can cause different complications: namely retinopathy; nephropathy, heart disease and amputations, hence the need for lifelong treatment, through glycemic control, which will improve the quality of life of patients

and at the same time reduce the high cost of care for the sector of health, the expenditure of which in Morocco in 2010 exceeded 206 million USD [9]. Moreover, overweight and obesity are considered to be essential risk factors for diabetes, their control by a balanced diet supplemented with regular physical activity helps prevent this disease [10 , 11]. This work aims to study overweight and obesity and glycemic control in diabetics from the only provincial reference center for diabetes (CRD) in Kenitra, Morocco.

Methodology:

The present study was carried out in Kenitra, whose total population was estimated at 1034114 inhabitants in 2014 [12], including 600 963 in urban areas and 433,151 in rural areas. The sample studied is made up of 2227 diabetics (58% of women; 42% of men), who consulted the CRD in kénitra from January to December 2015, the number of patients coming from urban areas dominates with a percentage by 74%. The age range is 8 months to 80 years. The data were collected by means of a questionnaire containing the socio-demographic information of the patients. Overweight and obesity were determined by calculating the Body Mass Index (BMI = Weight / Height 2), (Kg / m 2)), which are defined respectively by BMI>2) and BMI> 30 Kg / m 2). Weight and height measurements are performed according to the WHO standard [13], in indoor clothing, without shoes. The weight was obtained using a Seca 761 - Class IIII mechanical personal scale, with an accuracy of 0.1 kg. The height was measured using a measuring rod with an accuracy of 0.1 cm. The glycemic control was carried out by two twin blood tests of the glycemia: glycosylated hemoglobin (HbA1C) which makes it possible to evaluate the glycemic balance during the two to three months preceding; it is a good indicator of the sweetness of our organism and therefore of the risk of diabetic complications, and Fasting capillary glycemia, which is a snapshot of the glycemic state. The standards are 7% for glycosylated hemoglobin and 0.70g / l to 1.10g / l for fasting blood sugar. Fasting capillary blood glucose was measured by an Accu-Chek Active brand blood glucose meter by analyzing a drop of blood, taken from the fingertip, using a lancing device. The glycosylated hemoglobin was measured by a device of the "SIEMENS" brand, which allows the determination of the glycolysed hemoglobin from a drop of blood by the intervention of the reactive cassettes, provided by the Ministry of Health. The data were entered and analyzed on SPSS version 16 software. Frequencies and percentages were calculated for the qualitative variables and the means and standard deviations (δ) for the quantitative variables. Before inclusion in the study, authorization for the survey is obtained from the provincial health delegation, (CRD) staff and patients were informed about the objectives of the survey. The oral consent of the patients was obtained before the administration of the questionnaire, moreover, anonymity and respect for the confidentiality of the data were ensured.

Results;

The sample for the present study is 2227 patients (58% of women; 42% of men), with a predominance of patients coming from urban areas (74%).

Overweight and Obesity: TheTable 1represents the prevalences of diabetics and the mean BMIs of the sample by sex and type of diabetes. Type 2 diabetes represents 88% of patients, 11% for type 1 diabetes and only 1% for gestational diabetes. We note that overweight affects all patients (BMI> 25 Kg / m 2), it is more marked in women (BMI> 29.15> 25 Kg / m 2) than men (BMI> 27.78 ± 2.3Kg / m 2). The average BMI of women tends towards obesity (IMC≈30): (29.21 Kg / m 2 ± 3.1) for gestational diabetes and (29.15 Kg / m 2 ± 3.2) for Type 2 diabetes.

Table 1: Prevalence of diabetes and mean BMI of the sample by sex and type of diabetes

Type of diabetes	Sex	Ages (Avg ± δ)	BMI (Avg ± δ)	Prevalence in type (%)	Total prevalence (%)
Type 1					11%
	Women	15.3 ± 4.1	……	44%	
	Man	12.1 ± 5.3	……	56%	
Type 2					88%
	Women	45.0 ± 2.3	29.15 ± 3.2	57%	
	Man	50.2 ± 1.8	27.78 ± 2.3	43%	
Gestational	Women	40.2 ± 7.5	29.21 ± 3.1	100%	1%

Glycemic control: TheTable 2reports glycemic control values above the standards: with 8.5% ± 2.6> 7% for glycosylated hemoglobin and 1.5 g / l ± 1.3> 1.10 g / l for fasting capillary glycemia . The difference between the values of glycosylated hemoglobin between men (8.5 7% ± 2.6) and women (8.1% ± 2.3) is not significant (P> 0.05), idem, for fasting capillary glycemia: for men (1.44 g / l ± 1.1) and women (1.43 g / l ± 1.2). Pearson's correlation coefficients are highly significant (P <0.00); on the one hand between BMI and fasting capillary glycemia (r = 0.5) and on the other hand between BMI and glycosylated hemoglobin values(r = 0.4), the aim of these treatments in diabetics is generally to maintain normal blood sugar levels in order to avoid the development of acute complications [14 - 16]. We note that oral antidiabetics (ADO) is the most frequent treatment in this sample with a percentage of 67%.

Table 2: The assessment of glycemic control by blood tests of diabetics

Blood tests	Man	Women	P value
Glycosylated hemoglobin	8.5% ± 2.6	8.1% ± 2.3	P> 05; NS
Fasting capillary blood glucose g / l	1.44 g / l ± 1.1	1.43 g / l ± 1.2	P> 05; NS

NS = not significant; p> 0.05

Discussion:

Diabetics in the present study from urban areas dominate with a percentage of 74%; this percentage is explained by the high number of the population in urban areas 600963 (60%) than the rural 433151 (40%) in the province of kénitra [12]. 88% of diabetics are type 2, this result is normal because this type is the most common form of diabetes in the world, with a prevalence of 90 to 95% [17 - 19]. 11% of diabetics are type 1, this result is close to 5 to 10% found in the world [20], and only 1% corresponds to gestational diabetes, this prevalence is similar to 4% mentioned by Canadian population studies [21 , 22]. Overweight affects all of this population (BMI> 25 Kg / m 2), it is more marked in women (BMI> 29.15> 25 Kg / m 2) than in men (BMI> 27.78 ± 2 , 3Kg / m 2) this difference is the same reported by the national survey on anthropometry in 2011 in Morocco where overweight is more frequent in women (61.1%) than in men (38.9%) [23]. The average BMI of women tends towards obesity (BMI ≈ 30): (29.21 Kg / m 2 ± 3.1) for gestational diabetes and (29.15 Kg / m 2 ± 3.2) for Type 2 diabetes; these results are similar to those reported by Nthangeni et al. in 2002 [24] and Alebiosu and Odusan in 2004 [25]; and according to Rooney and Schauberger in 2002 [26]; and gore et al .; in 2003 [27] the presence of overweight in women with gestational diabetes was explained, by the excessive weight gain during pregnancy (it is 0.5 to 3 kilograms and can even reach up to 17.7 kg in some women); and retention of this excess weight persists after childbirth [27].

The glycemic control values of these patients are higher than the standards of [16 , 28 , 29]: with 8.5% ± 2.6> 7% for glycosylated hemoglobin and 1.5 g / l ± 1.3> 1.10 g / l for fasting capillary blood glucose; similar results were approved by the study by A. coulibaly et al in 2007 [30], who worked on type 2 diabetics and found a glycosylated hemoglobin value equal to 8.4 ± 2.3 and 1.44 ± 0.9 for fasting blood sugar. The difference between the glycosylated hemoglobin values between men (8.5 7% ± 2.6) and women (8.1% ± 2.3) is not significant (P> 0.05), idem, for fasting capillary glycemia: for men (1.44 g / l ± 1.1) and women (1.43 g / l ± 1.2), same result reported by the study of A. coulibaly and al in 2007 [30], this justifies that diabetes is not linked to sex. Pearson's correlation coefficients are highly significant (P <0.005); on the one hand between BMI and fasting glycemia (r = 0.5) and on the other hand between BMI and glycosylated hemoglobin values (r = 0.4); this result can be explained by the fact that overweight can lead in most cases to poorly balanced diabetes [31]. Oral antidiabetics (ADO) is the most frequent treatment with a percentage of 67%; this result is directly related to the high rate of type 2 diabetics (88%), due to the fact that OADs represent the treatment used in the majority of cases to treat type 2 diabetics [32]. 1% of patients are under hygiene-dietetic rules alone, and this could be explained by the fact that in the majority of cases, the diabetic consults the CRD in a state of chronic hyper glycemia where the hygiene-dietetic rules: such as Balanced diet alone will not give the desired results.

Conclusion:

All of these diabetics have BMI and glycemic control values above the norms. In-depth research is needed on these diabetics in order to establish an urgent program of remediation.

State of current knowledge on the subject

Diabetes is a major public health problem; the fact that its prevalence is increasing;Diabetes is a chronic, incurable disease with a risk of complications;Diabetes requires good management which elucidates in lifelong treatment, monitoring of overweight and obesity and regular glycemic control.

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