

Anthropometry of Morocco Patients with Diabetes Type 2: Prevalence of General and Abdominal Obesity by Gender



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Introduction

The increasing incidence of obesity and types 2 diabetes (DT2) is a critical public health problem [1]. (NCD-RisC /AWG, 2016) given its importance as a cause of mortality, morbidity and the costs of the health system worldwide [2,3]. DT 2 which was a disease diagnosed most often at an age which is close to 65 years old, is now a pathology that affects all age groups. Morocco, with regard to the countries in transition in epidemiology, is not exempt from this global trend; about 1.5 million Moroccans aged more than 20 years are diabetics [4]. The National Survey noted that the prevalence of diabetes varies from one region to another [5]. According to the same source, the region of Rabat-salé Zemmour-Zaer, due to its geographical location and other specific characteristics, has major constraints such as high concentration of the population in the urban environment, a tendency to depopulate the countryside and, illiteracy which spares no age group of the population aged 10 years and over. In this study we will first examine the prevalence of obesity in adults with type 2 diabetes and secondly identify the gender group that present an increased risk of obesity.

Material and Methods

This is a cross-sectional and a descriptive study, conducted between June 2016 and September 2016 at the Sidi Lahcen Temara Provincial Hospital in Morocco including all patients with type 2 diabetes over the age of 18 and excluding gestational diabetes and type 1 diabetes. Data collection was based on the administration of the questionnaire and anthropometric measurements. The questionnaire was designed to obtain detailed information on socio-demographic, socioeconomic and diabetes data. In addition, we measured the

weight, height, waist circumference (WC) and hip circumference (HC) for each patient. These indices make it possible to assess general obesity defined for a BMI ≥ 30 Kg / m² (WHO, 1999) and abdominal obesity defined for a waist / hip ratio (WHR) high than 0.8 in women and 1 in men, and for a WC ≥ 102 cm in men and ≥ 88 cm in women (Lean et al. 1995). The IBM SPSS Statistics version 21 software was used for data analysis. The comparison of quantitative variables with normal distribution was carried out by the student t test or by the Mann-Whitney test when the parametric hypotheses were not satisfied. Qualitative variables were also compared using the Chi-Square or Fisher test. A threshold value of significance p of 0.05 was adopted for all statistical analyzes. The administration of the Hospital of Temara prefecture Sidi Lahcen gave their agreement for the realization of this study for epidemiological purposes. Informed consent was obtained from each patient at the beginning of the study.

Results

A total of 344 type 2 diabetic patients were included in this study with a median age of 56 [50-61] and a sex ratio of 0.32. The analysis of socio-demographic and economic parameters revealed a preponderance of the age group 50 to 59 years significantly high in men compared to women (p < 0.001). The majority of patients were from urban areas (84.9%), illiterate (73.3%) and with low socio-economic in 65.1% of cases. These last two parameters were significantly elevated in women compared to men (Table 1). With regard to anthropometric parameters, the overall analysis revealed that the average values of body mass index, waist circumference and hip size ratio exceeded the overweight threshold, respectively (27.32 \pm 4.43; 104.36 \pm 14.78 and 0.93 \pm 0.086). The study of the global

distribution of anthropometric variables by sex in our diabetic patients revealed that, the prevalence of obesity (86% versus 14%, $p < 0.001$) and abdominal obesity (84.6% versus 57.1%, $p < 0.001$) and mean hip circumferences ($p = 0.036$) and waist circumference ratio ($p < 0.001$) were significantly higher in women compared to men (Table 1).

Table 1: Parameters related to socio demographic, economic and anthropometric in the overall population and in gender groups.

Characteristics	Global Analysis N=344	Bivariate Analysis		p
		Men n=84(24.4)	Women n=260(75.6)	
Socio demographic and socio-economic data				
Ageα	56 [50-61]	58[54-68]	55 [47-60]	<0.001
AgeGroupβ				
20 to <30	6(1.7)	0 (0)	6(2.3)	<0.001
30 to <40	22(6.4)	4 (4.8)	18(6.9)	
40 to <50	56(16.3)	2(2.4)	54(20.8)	
50 to <60	136(39.5)	42(50)	94(36.2)	
60 to <70	84(24.4)	18(21.4)	66(25.4)	
70 and over	40(11.6)	18(21.4)	22(8.5)	
Place of Residenceβ				
Urban	292 (84.9)	80(95.2)	212(81.5)	0.002
Periurban	52 (15.1)	4 (4.8)	48 (18.5)	
Educational Levelsβ				
Illiterate	252 (73.3)	48 (57.1)	204 (78.5)	0.001
Primary	80 (23.3)	32(38.1)	48 (18.5)	
Secondary	12 (3.5)	4 (4.8)	8(3.1)	
University	0 (0)	0 (0)	0 (0)	
Professionβ				
Unemployed	72 (20.9)	48 (57.1)	24 (9.2)	<0.001
Regular work or retired	40 (11.6)	22 (26.2)	18 (6.9)	
Irregular work	24(7)	14 (16.7)	10(3.8)	
House wife	208(60.5)	0 (0)	208(80)	
Economic Status				
Low	224 (65.1)	46 (54.8)	178 (68.5)	0.022
Intermediate	120(34.9)	38(45.2)	82(31.5)	
High	0 (0)	0 (0)	0 (0)	
Anthropometric Variablesγ				
Weight (Kg)	73.84 \pm 12.27	75.36 \pm 10.48	73,35 \pm 12.78	0.194
Height (cm)	164.53 \pm 8.42	170.6 \pm 7.89	162.57 \pm 7.63	<0.001
BMI(Kg/m ²)	27.32 \pm 4.43	25.90 \pm 3.44	27.83 \pm 4.62	<0.001
Waist Circumference (cm)	104.36 \pm 14.78	104.42 \pm 13.12	104.35 \pm 15.30	0.966
Hip Circumference (cm)	112.11 \pm 15.52	109.28 \pm 13.44	113.03 \pm 16.06	0.036
Waist-to-hip ratio	0.93 \pm 0.086	0.95 \pm 0.05	0.92 \pm 0.09	0.008
BMI Groupβ		<0.001		
Low	2 (0.6)	0(0)	2(0.8)	<0.001
Moderate	104(30.2)	40(47.6)	64(24.6)	
Overweight	152(44.2)	32(38.1)	120(46.2)	
Obese	86(25.0)	12(14.3)	74(28.5)	
Abdominal Obesityβ				
No	76(22.1)	36(42.9)	40(15.4)	<0.001
Yes	268(77.9)	48(57.1)	220(84.6)	

Notes: Values are expressed as médiane and interquartils (α), count and percentage (β) or mean and standart deviation (\bar{y}). For body mass index (BMI) groups: low BMI = <18.5 kg/m²; normal BMI = 18.5 to <25 kg/m²; overweight BMI = 25 to <30 kg/m²; obese BMI = >30 kg/m². Obesity was defined for waist circumference ≥ 102 cm for men and ≥ 88 cm for women. Significance threshold $P < 0.05$.

*These results were statistically significant.

Discussion

344 patients with DT2 were recruited as part of their biological assessment in the laboratory of the hospital of SidiLahcen in the city of Temara. At the end of our study, we found that the most affected age group by DT2 was 50 to 59 years. These findings are in line with the latest national estimates, which have reported a prevalence of more than 14% in age groups beyond 50 years compared to a prevalence of 9% among all those aged over 20 years. We also found that three-quarters of diabetic patients were women (75.6%). This finding are supported by several studies which revealed that type 2 diabetes is a predominant pathology in women [6,7], in addition the National Family Health Survey [4] advocate that a women constitute a risk group. Regarding the analysis of anthropometric parameters, our work has highlighted a significantly higher increase in general and abdominal obesity in women compared to men. The analysis of trends in diabetes in Africa has shown that the age-standardized mean BMI increased from 21.0 kg/m² (95% credible interval: 20.3–21.7) to 23.0 kg/m² (22.7–23.3) in men, and from 21.9 kg/m² (21.3–22.5) to 24.9 kg/m² (24.6–25.1) in women and the age standardized prevalence of diabetes increased from 3.4% (1.5–6.3) to 8.5% (6.5–10.8) in men, and from 4.1% (2.0–7.5) to 8.9% (6.9–11.2) in women [8]. Taking into account the findings of this study we can make a link with the results of this work showing a preponderance of obesity and diabetes in female diabetic patients.

Conclusion

This work may provide the best opportunity to promote a healthy lifestyle including obesity prevention particularly in women who present an important risk of DT2.

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