

Full Length Research Paper

Prevalence of overweight and obesity in medical consultation at the National Teaching Hospital “Hubert Koudougou Maga” of Cotonou / Benin

AZON-KOUANOU Angèle¹, KEREKOU Anelie², ZANNOU Djimon Marcel¹, AGBODANDE Kouessi Anthelme¹, BOCOVO Gbèmandé Mylidia Alida¹, ADE Gabriel¹, HOUNGBE Fabien¹, HOUINATO Dismand Stéphane³

¹Department of Internal Medicine and Medical Oncology, ²Department of Endocrinology and Metabolic Diseases, ³Department of Neurology, National Teaching Hospital (NTH) “Hubert Koutoukou Maga” (HKM) of Cotonou / Benin. Corresponding author E-mail: Email: angele.azonkouanou@gmail.com. Tel: (00 229) 97 99 78 50.

Accepted 31 October, 2015

The objective was to assess the hospital prevalence of overweight and obesity outpatients medical consultation at NTH-HKM Cotonou. **Methods:** A cross-sectional descriptive and analytical study was conducted in medical consultation NTH-HKM Cotonou from June to September 2011. Overweight and obesity were identified from the Body Mass Index (BMI) calculated based on the formula weight (kg) / size (m)². Overweight was defined by a BMI between 25 and 29.9 kg / m² and obesity BMI > 30 kg / m². **Results:** Out of the 1,000 patients studied, 556 (55.6%) were females (sex ratio equal to 1.3). The average age of patients was 48.1 ± 14.5 years-old. Overweight was observed in 353 patients (35.3%) and obesity in 275 (27.5%). Male prevalence of overweight was 36.5% (162 out of 444 cases) against 34.4% for females (191 cases out of 556) (p = 0.48), while male prevalence of obesity was 16.9% against 36% for females (p < 10⁻⁷). These rates of prevalence increased significantly with age (p < 10⁻⁶). Occupation (housewife, unemployed) and marital status (married, divorced) were identified as associated factors. **Conclusion:** The high prevalence of overweight and obesity in our study calls for raising awareness about the lifestyle and the practice of physical activities among the population.

Keywords: Obesity, overweight, prevalence, internal medicine, NTH-HKM, Cotonou, Bénin.

INTRODUCTION

Obesity, once considered as a sign of affluence in the African black culture, has now become a concern in terms of our people's health. The World Health Organization (WHO) estimates that more than one billion adults worldwide are overweight and 300 million of them are obese (WHO expert committee, 1995). The incidence of obesity is increasing. In industrialized countries, it has increased from 5% to 10% over the last ten years (Raccah, 2000; Chobanian et al., 2003). The increase in the prevalence of obesity was confirmed by the study conducted in Africa (Ba, 2000; Zabsonre et al., 2000; Etoundi et al., 2001; Monabeka et al., 2007). Benin is not

spared by this phenomenon. A hospital prevalence study was conducted on patients in outpatients' department of NTH. The purpose of this study was to assess the scale of cardiovascular risk factor in order to develop a prevention program.

PATIENTS AND METHODS

Framework and Nature of the Study

This was a descriptive and analytical cross-sectional study which was carried out from 15th June to 16th September 2011 at the National Teaching Hospital

“Hubert Koutoukou Maga” (NTH / HKM) of Cotonou, Benin.

Studied Population and Data Collection

The study included all patients aged 15 and above admitted to the medical consultation, during the study period, and give their free informed consent. It excluded patients who did not give their consent to participate in the study such as: pregnant women, and those unable to answer questions.

Medical consultation involved medical specialties such as internal medicine, neurology, gastroenterology, endocrinology, and rheumatology. Each of these specialists had his consultation day. The sample size was calculated using SCHWARTZ formula and estimated at 938, but the study actually focused on 1,000 patients. For the sampling technique, we conducted an extensive enrolment of all patients consulted in the period and fulfilling the inclusion criteria.

The data collection technique was typically a questionnaire we filled ourselves. Clinical data were recorded in the waiting room before the various consultations.

Studied Variables

The following parameters were studied: socio-demographic data (age, gender, ethnicity, educational level, origin, occupation, religion and marital status) and clinical data (weight, size, body mass index (BMI)).

The weight of patients wearing only light clothes was taken in the consultation waiting room by using bathroom scale. The height was measured using a height gauge while patients were standing straight up and barefooted. The BMI was obtained from the ratio of weight in kilograms divided by the size in m^2 according to the formula (weight (kg) / (height (m) 2)). Overweight was defined by a BMI between 25 and 29.9 kg / m^2 , and obesity by BMI > 30 kg / m^2 .

Statistical Analysis

The collected data were entered by using Epi-data software 3.1 and analyzed with Epi Info 3.3.2 software. The quantitative variables were calculated using the average of the standard deviation. Prevalence comparisons were made using χ^2 test and average of comparisons with Student test. A P-value lower or equal to 0.05 was considered statistically significant.

RESULTS

Out of the 1,000 patients studied 444 were male (44.4%) and 556 female (55.6%). Sex ratio (male / female) was 1.3.

The average age of patients was 48,1ans \pm 14,5ans.

Overweight and obesity global prevalence

Among the 1,000 patients included in the study, 353 (35.3%) were overweight and 275 (27.5%) were obese.

Overweight and Obesity Prevalence per gender

Out of the 444 men, who participated in the study, 162 were overweight, representing a prevalence of 36.5% against 34.4% for 556 women ($p = 0.48$). As for obesity, 75 men were obese representing a prevalence of 16.9% against 36% for women ($p < 10^{-7}$).

Prevalence of overweight and obesity per age

Table 1 shows the prevalence of overweight and obesity age. This prevalence increased significantly with age up to 45 years-old for overweight and 55 for obesity ($p < 10^{-6}$).

Prevalence of overweight and obesity per education level

Table 2 shows the rates of prevalence of overweight and obesity per education level. This factor does not interfere significantly in the prevalence, neither overweight nor obesity.

2-5 Prevalence of overweight and obesity per occupation. The prevalence of overweight was significantly higher among housewives ($p < 10^{-4}$) and, that of obesity significantly higher among the unemployed ($p < 10^{-6}$). **Table 3** shows information related to obesity and overweight per occupation.

Prevalence of overweight and obesity per marital status

Figure 1 Summarizes the prevalence of overweight and obesity per marital status of the respondents. The prevalence of overweight was significantly higher among married people ($p < 10^{-5}$) and that of obesity significantly higher among divorced people ($p < 10^{-6}$).

Prevalence of overweight and obesity per origin

Table 4 shows the prevalence rates of overweight and obesity per patients origin. They did not vary significantly from one area to another.

Patients Overweight and Obesity Characteristics

The 353 overweight subjects had an average age of 50.1 \pm 12.8 years-old; their average weight was 74.7 \pm 8.1kg for an average height of 1.65 \pm 0.08 m. Among them, 28 subjects (7.9%) were smokers and 34 (9.6%) alcohol addicted. 297 subjects had an imbalance diet of fruits and vegetables (84.1%) whereas 201 patients were inactive. The 275 obese subjects had an average age of 50.8 \pm 11.3 years; their average weight was 12.4 \pm 92.7kg against an average height of 1,63m \pm 0.07m. Among them, 29 (10.5%) were smokers; 36 (13.1%) were alcohol addicted and 225 subjects had an imbalance diet of fruits

Table 1. Prevalence of overweight and obesity per age.

Variables	Number n	Total	Prevalence %	P value
Overweight				
15-25 years-old	10	83	12.1	<i>p</i> <10 ⁻⁶
26-35 years-old	38	139	27.3	
36-45 years-old	76	183	41.5	
46-55 years-old	104	252	41.3	
56-65 years-old	81	211	38.4	
>65 years-old	44	132	33.3	
Obesity				
15-25 years-old	4	83	4.8	<i>p</i> <10 ⁻⁶
26-35 years-old	28	139	20.1	
36-45 years-old	58	183	31.7	
46-55 years-old	89	252	35.3	
56-65 years-old	61	211	28.9	
>65 years-old	35	132	26.5	

Table 2. Prevalence of overweight and obesity per education level.

Variables	Number n	Total	Prevalence %	P value
Overweight				
Out of school	29	83	34.9	<i>p</i> =0,99
Primary	71	200	35.5	
Secondary	157	442	35.5	
Higher	96	275	34.9	
Obesity				
Out of school	22	83	26.5	<i>p</i> =0,16
Primary	66	200	33.0	
Secondary	122	442	27.6	
Higher	65	275	23.6	

and vegetables (81.8%); 173 patients were inactive (62.9%).

Moreover, among the 275 obese subjects, 182 (66.2%) had hypertension; 79 (28.7%) had diabetes history; 9 (3.3%) had stroke history and 4 (1.5%) had heart disease history. Among the 353 overweight subjects, 181 (51.3%) had hypertension; 72 (20.4%) had diabetes history; 9 (2.6%) had stroke history and 4 (1.1%) had heart disease history.

DISCUSSION

Nowadays, there are over 300 million obese worldwide, and that number could double in twenty years' time (Golay et al., 2005). In developed countries, the prevalence of obesity is between 15% and 30%. In 2002 in Switzerland overweight affected one third of the population and obesity increased to 7.7%. An increase in daily caloric intake and reduced physical activity are the

Table 3. Prevalence of overweight and obesity per occupation.

Variables	number n	Total	Prevalence (%)	P value
Overweight				
Civil servants	122	286	42.7	
Private sector workers	25	81	30.9	
Self employed	100	301	33.2	
Student/Pupil/Apprentice	12	79	15.2	p<10⁻⁴
Housewives	30	67	44.8	
Unemployed	1	4	25.0	
Pensioners	63	182	34.6	
Obesity				
Civil servants	68	286	23.8	
Private sector workers	24	81	29.6	
Self employed	100	301	33.2	p<10⁻⁶
Student/Pupil/Apprentice	3	79	3.8	
Housewives	27	67	40.3	
Unemployed	2	4	50	
Pensioners	51	182	28.2	

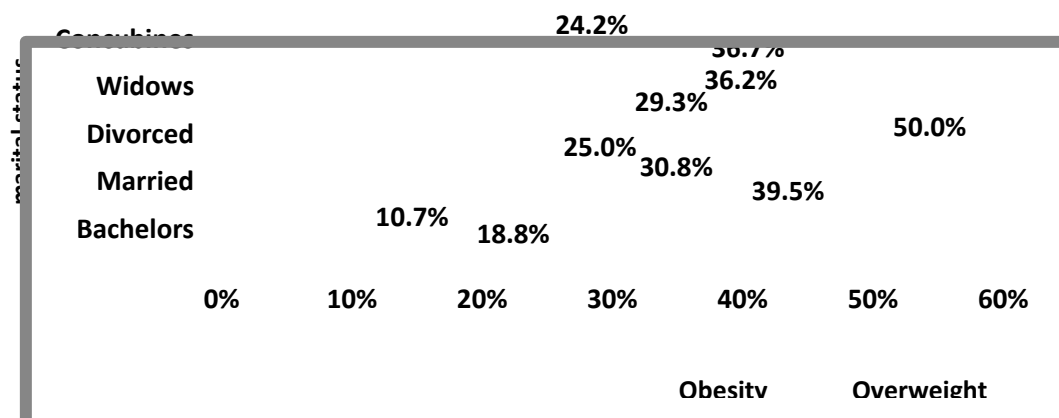


Figure 1. Prevalence of overweight and obesity per marital status.

main causes (Golay et al., 2005). The study of obesity and other cardiovascular risk factors is of a great interest in developing countries. Indeed, studies showed constant

increase in obesity since the 90s, both in developed (Rolland-Cachere et al.,1991; Kuczmarski et al.,1994) and developing countries (Ziegler et al., 1998).

Table 4. Overweight and Obesity Prevalence per origin.

Variables	Number n	Total	Prevalence %	P value
Overweight				
Atlantique/littoral	282	807	34.9	<i>p=0,8</i>
Ouémé/Plateau	35	89	39.3	
Zou/Collines	18	48	37.5	
Mono/Couffo	11	36	30.6	
Borgou/Alibori	5	12	41.7	
Atacora/Donga	2	8	25.0	
Obesity				
Atlantique/Littoral	229	807	28.4	<i>p=0,3</i>
Oueme/Plateau	25	89	28.1	
Zou/Collines	10	48	20.8	
Mono/Couffo	5	36	13.9	
Borgou/Alibori	3	12	25.0	
Atacora/Donga	3	8	37.5	

Today, obesity exists in every country across the world. Its prevalence is particularly high in some industrialized countries, and also grows in developing countries.

Among the 1,000 subjects who were interviewed, 275 were obese amounting to a prevalence of 27.5%. This prevalence is much higher than that of West African populations estimated at 10% (Abubakari et al., 2008). However a higher prevalence (32.9%) was found in outpatients' department in Lome by (Pessinaba et al., 2012). A similar prevalence (27.7%) was also found in 1999 in Tunisia (Ghannem et al., 1999). Out of Africa, that prevalence is also similar to the one observed in Kosovo (32.7%) among subjects of 30-83 years-old (Ahmi et al., 2006).

Several studies in Africa reported a prevalence of female overweight (Siminialayi et al., 2008; Kamadjeu et al., 2006). Indeed, overweight or obesity among African women is considered as a sign of wealth and beauty, especially if they are married. When a married woman is not overweight, people say she does not make her husband proud. Conversely, in France (Castetbon et al., 2006) found male prevalence of overweight.

Our results also show that the prevalence of female obesity doubles that of male (36%) against (16.9%). This gender difference was highlighted by several other studies (Ahmi et al., 2006; Siminialayi et al., 2008; Kamadjeu et al., 2006; Castetbon et al., 2006). On one hand, the high prevalence of obesity is due to westernization of lifestyles. On the other hand, female prevalence also finds an explanation in the desire of women to have a beautiful body image, sign of wealth and well-being in our regions.

Based on data from our study, It has been established that both obesity and overweight increase with age (Pisunyer, 2006). Indeed, this prevalence increased

significantly with age up to 45 years and 55 years for overweight and obesity respectively.

Obesity is a complex and multifactorial disease. The role of socioeconomic factors is known, but few studies have attempted to analyze separately the impact of these different factors involved in this status, such as: income, level of education, culture, and social status (La Rosa et al., 2003). In our study, the prevalence of both overweight and obesity did not vary significantly with the level of education ($p = 0.99$ and $p = 0.16$). However, (La Rosa et al., 2003) have discovered in a study conducted in 2003 in Paris that the prevalence of obesity was significantly associated with the level of education, whether it is low or not.

Depending on the profession, the prevalence of overweight was significant among housewives ($P < 10^{-4}$) and that of obesity was significantly higher among the unemployed, Based on the study of (La Rosa et al., (2003), the risk of obesity is multiplied by 1.62 for the unemployed and by 1.5 labourers, in comparison with that of liberal professionals.

With regard to marital status, overweight was greater among married people (39.5%) with ($p < 10^{-5}$) and half (50%) of divorcees were obese with ($p = 10^{-6}$). Four out of five people (81.8%) had an imbalance diet of fruit and vegetables, which is high enough. It is less than the prevalence (84.20%) recorded by (Kérékou et al., 2015) in medical consultation in CNHU Cotonou, and also lower than the one reported by (Gbarry et al., 2008) which is 80% in a 2011 study conducted among the general population in Cotonou. Indeed, Gbarry's study was carried out in both urban and rural populations where access to fruit is easier in cost standpoint and geographical accessibility. Other countries in the world have recorded a much lower prevalence 79.3% in Guinea-Conakry

(Moussa et al., 2012), and 56% in Canada in 2009 (Dai et al., 2009). The prevalence of physical inactivity in patients with overweight was 62.9%, in our study. The risk of obesity was 2.28 times among inactive people, while (Kérékou et al., 2014) had recorded a prevalence of 57.6%. More than half of the population were inactive. This high prevalence is still worrying. Indeed, the studied population is urban with westernization of lifestyles. In our local environment, the smallest distances are covered by using a commonly known motorcycle taxi "Zémidjan" (Kérékou et al., 2014). So, there is crucial need to raise awareness about practicing sporting activities

CONCLUSION

The high prevalence of overweight and obesity in this study is worrying. It can certainly be explained by the urban studied population with a western lifestyle in which physical activity is non-existent. A study on a large scale throughout the country is needed to better assess the prevalence. But in the meantime it is necessary to raise awareness about practicing sporting activities for the well being of the population.

REFERENCES

- Abubakari AR, Lauder W, Agyemang C, Jones M, Kirk AF, Bhopal RS (2008) Prevalence and time trends in obesity among adult West African populations: a meta-analysis. *Obes Rev*; 9(4): 297-311.
- Ahami AOT, Soualen A, Aboussaleh Y (2006). L'obésité chez les adultes albanais de l'ex Yougoslavie et facteurs associés. *Antropo*; 12: 35-41.
- BA ML (2000) Obesity in Mauritania: epidemiologic aspects. *Tunis Med*; 78(11): 671-676.
- Castetbon K, Vernay M, Deschamps V, Salanave B, Malaon A, Hercberg S (2006). Situation nutritionnelle en France selon les indicateurs d'objectif et les repères du Programme national nutrition santé (PNNS)-Étude nationale nutrition santé (ENNS,): prévalences de l'obésité, de l'hypertension artérielle et des dyslipidémies. *Journal Obésité* 3 (1).19-26.
- Chobanian AV, Bakris GL, Black HR, Cushman WC, Green LA, Izzo JL JR, Jones DW, Materson BJ, Oparil S, WRIGHT JT JR, Roccella EJ (2003) The Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure: the JNC 7 report. *JAMA* ; 289(19) : 2560-2572.
- Dai S, Bancej C, Bienek A, Walsh P, Stewart P, Wielgosz A (2009). Suivi des maladies du cœur et des accidents vasculaires cérébraux au Canada. *Maladies chroniques au Canada* ; 29 (4) : 1-6.
- DOI: 10.1002/(SICI)1520-6300(1996)8:6<786::AID-AJHB11>3.0.CO;2-1 Izabsonre P, Sedogo B, Lankoande D, Dyemkouma FX, Bertrand ED (2000). Obésité et maladies chroniques en Afrique Sub-saharienne. *Med Afr Noire*, 47 : 5-9.
- Etoundi NLS, Longo F, Melaman SF, Temgoua TS, Bopelet M (2001). Obésité, hypertension artérielle et diabète dans une population de femmes rurales de l'ouest du Cameroun. *Med Afr Noire* ; 40 : 391-393.
- Gbary AR, Houehanou YC, Kpozehouen A, Djrolo F, Fagbohoun M, Segnon-Agueh J, Houinato DS, Salamon R. (2011). Prévalence de l'insuffisance de consommation de fruits et légumes et facteurs associés en population générale au Bénin en 2008. *J. Epid et Santé Pub* ; 6 : 43-52 http://www.jesp-dz.com/wp-content/uploads/downloads/2012/01/article_5.pdf
- ghannem H, fredj AH (1999) Habitudes alimentaires et facteurs de risque Cardiovasculaire : Etude épidémiologique au Sahel Tunisien. *La Presse médicale* ; 28 (19): 1005-1008.
- Golay A, Masciangelo ML (2005). Poids de l'obésité : de l'épidémie aux coûts. *Rev Med Suisse*; 1 : 807-813.
- Kamadjeu RM, Edwards R, Atanga JS, Unwin N, Kiawi EC Mbanya JC (2006). Anthropometry measures and prevalence of obesity in the urban adult population of Cameroon: An update from the Cameroon burden of diabetes baseline survey. *BMC Public Health*; 13 (6) : 228. Published online 2006 Sep 13. doi: 10.1186/1471-2458-6-228
- Kerekou A, Azon-Kouanou A, Bocovo M, Amoussou-Guenou D, Djrolo F, Houinato DS (2015). Enquête de prévalence de la consommation insuffisante de fruits et légumes en médecine externe au CNHU/HKM de Cotonou. *Médecine d'Afrique noire* ; 62 (1) : 56-62.
- Kerekou A, Azon-Kouanou A, Bocovo M, Amoussou-Guenou D, Drolo F, Houinato DS (2014). Enquête de prévalence de l'inactivité physique en médecine externe au CNHU/HKM de Cotonou. *Médecine d'Afrique noire* ; 61(12): 592- 596.
- Kuczmarski RJ, Flega KM, Campbell SM, Johnson CL (1994) Increasing prevalence of overweight among us adults : The National Health and Nutrition Examination Surveys, 1960 to 1991. *JAMA*; 272 : 205-211.
- LA Rosa E, Valensi P, Cohen R, Soufi K, Robache C, LE Clesiau H (2003). Déterminisme socio-économique de l'obésité en Seine-Saint-Denis. *Presse Med.*; 32: 55-60.
- Monabeka HG, Bouenizabila E, Kibeke P, Nsakala-Kibangou N (2007) L'obésité et le diabète de type 2 en milieu urbain congolais. *Ann Univ M Ngouabi* ; 8(5) : 38-42.
- Moussa Balde N, Camara A, Onivogui G, Diakite M, Bah MC, Kone M, Bangoura S, Dieng K, Bah A, Oumar Barry T, Diallo MM, Diallo MA (2012). Diabète et Maladies chroniques non transmissibles en Guinée : les facteurs de risque sont fréquents. *Diabète Metabolism.* ; 38 (2) : A 16 Doi : 10.1016/S1262-3636(12)71043-1.
- Pessinaba S, Yayehd K, Pio M, Baragou R, Afassinou Y,

- Tcherou T, Damorou F (2012). L'obésité en consultation cardiologique à Lomé : prévalence et facteurs de risque cardio-vasculaire associés-étude chez 1200 patients. *The Pan African Medical Journal*; 12 (99) : 1-6
- Pi-Sunyer FX (2002). The epidemy of obesity: pathophysiology and consequences of obesity. *Obesity Research.*; 10(2) : 97-104.
- Raccah D. (2000) Obésité: épidémiologie, diagnostic et complications. *Endocr Metab Nutr* ; 50 ; 549-552.
- Rolland-Cachere MF, Spyckerelle Y, Deschamps JP (1991). Evolution of pediatric obesity in France. *Int J Obesity*; 156 : 1-5.
- Siminialayi I, Emem-Chioma P, Dapper D (2008). The prevalence of obesity as indicated by BMI and waist circumference among Nigerian adult attending family medicine clinics as outpatients in Rivers state. *Niger J Med.*; 17(3) : 340-345.
- Who Expert Committee (1995) Physical status the use and interpretation of anthropometry. WHO Technical Report Series n° 854, Geneva : WHO, 452 p
- Ziegler O, DERBY O (1998). Épidémiologie des obésités de l'adulte. *Encycl Med Chir (Elsevier, Paris), Endocrinologie-Nutrition*, 10-506-B-20: 7p.