# UNCOMPLICATED OBESITY IN AN AFRICAN AMERICAN POPULATION SEEKING MEDICAL WEIGHT LOSS

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**Objective:** Obesity is highly prevalent and adds greatly to the risk of cardiovascular and metabolic diseases. However, a subset of the obese has been identified who do not appear to carry this risk. Some studies suggest that anthropomorphic correlates of risk, such as waist circumference, differ between African Americans and Whites and features of uncomplicated obesity have not been well characterized in this population. The goal of our study was to determine the prevalence and associated features of uncomplicated obesity, including relationships to waist circumference and the achievement of weight loss in primarily African American patients.

**Design:** A retrospective chart review.

**Setting:** Outpatient medically supervised weight loss program located at a teaching hospital in Washington, DC.

**Participants:** Predominately adult African American females.

**Results:** Thirty-one percent of our population had no documented metabolic or cardiovascular disease. This group was on average younger, but had similar waist circumference (44 ± 13.8 vs 44 ± 6.6 inches) and achieved similar mean weight loss at 3 months (9.9 ± 10.4 vs 10.3 ± 12.4 lbs.) as the group with comorbid conditions.

**Conclusions:** Waist circumference was not an indicator of risk among African American women and achieved weight loss did not depend on pre-existing comorbidities. (*Ethn Dis*. 2013;23[4]:441–444)

**Key Words:** Obesity, Weight Loss, African American, Women, Cardiovascular Disease, Metabolically Healthy Obese

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## INTRODUCTION

Obesity affects 36% of the US population[1] and adds greatly to the risk of cardiovascular and metabolic diseases. Non-Hispanic Black women have higher rates of obesity than any other demographic group.[2] Effective treatments for weight loss are resource intensive and difficult to access, particularly for disadvantaged minority populations.

There is a subset of the obese population, however, for whom obesity does not appear to confer risk of hypertension, diabetes and dyslipidemia. These individuals have been designated by some authors as the metabolically healthy obese (MHO). Studies of populations of predominantly European descent have shown that the MHO have lower visceral fat and a smaller waist circumference (WC) than their obese counterparts with metabolic dysregulations.[3] This phenotype may help explain the mechanism whereby some individuals are more resistant to the development of metabolic abnormalities and consequent cardiovascular problems associated with obesity. However, there is accumulating evidence that the clinical significance of WC differs between ethnic populations. Waist circumference is a measure of body fat distribution and a marker of visceral adiposity. Elevated WC has been associated with increased cardiovascular disease and subsequent mortality in the general population.[4] There has been evidence for variability between ethnic groups as to the cut-off points of WC that portend this risk. In one epidemiological study using a sample of adult volunteers, the optimal WC threshold for the clinical identification of cardiometabolic risk factors in African American (AA) women was 9 cm higher than the currently recommended threshold (88cm) whereas for White women the study derived threshold was 4 cm higher.[5] In a study analyzing 1,409 premenopausal women, relationships between WC and visceral adipose tissue (VAT) differed between Blacks and Whites. Whites had a greater increase in VAT per unit increase in WC whereas an increase in WC in Blacks did not correlate with increasing visceral abdominal fat.[6] However, Cherqaoui, et al found 13.5 cm lower mean WC in their MHO (28.5% of sample) than in their non-MHO group among 126 obese AA volunteers (114 female) studied at our institution.[7] Therefore, the anthropomorphic profile of MHO Black populations remains unresolved.

Given the resource intensity of, and commitments required for available treatments, distinguishing populations within the obese that are at greater or reduced risk for cardiovascular disease may have implications for how vigorously weight loss should be recommended to individual patients. In that there may still be health benefits as well as benefits to social adaptation and self-image for

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weight loss among those with uncomplicated obesity, it would also be of value to evaluate whether this group responds similarly to weight loss as groups who have an identifiable health consequence of their obesity. We were unable to identify studies in the literature that evaluated relationships of existing medical conditions and motivation toward or achievement of weight loss. Our study therefore sought to further evaluate the prevalence, associated features including WC, and response to weight loss intervention of the uncomplicated obese state in a predominantly AA population seeking medical weight loss.

## METHODS

We conducted a retrospective chart review from a fee-for-service medical weight-loss clinic at a historically Black academic institution serving residents of the Washington, DC Metropolitan area. The program is part of a comprehensive bariatric center which offers both medical and surgical weight loss options. Patients come to the program through self referral or are referred by their primary care physician. Clinical intake at the initial visit included completing a medical and nutritional history survey, and undergoing a physical examination. Motivations for weight loss were recorded by the patient and included improved health and wellness, and prevention of obesity related health complications. Patients were placed on a daily 500-calorie deficit diet that included 90–120 grams of daily protein and 100 grams of carbohydrates (mainly through fruits and vegetables with limitation of starches and simple sugars). Patients were encouraged to use protein meal replacement shakes for breakfast. Vitamins, nutritional supplements and prescription medications for appetite control were also used in the program. Patients were encouraged to perform daily physical activity based on their preferences. Food and activity journals were reviewed at follow-up visits. The program was not limited in duration and patients on average continued for 3 to 6 months. Visits were scheduled weekly for 1 month at the initiation of medications, and bimonthly thereafter. Once patients were following the diet and lifestyle as recommended by the physician, visits were decreased to monthly.

We reviewed 251 consecutive charts on patients seen between 2009 and 2012. Of these charts reviewed, 168 had both BMI and WC measurements recorded from the initial evaluation (Our practice evolved from that of a private practice setting into a more rigorous academic setting, and collection of WC was not available in the earlier charts and therefore these charts were excluded). These weight and BMI measurements were obtained and analyzed using the American weights and measures body composition scale or Tanita Body Composition analyzer that utilizes bioelectric impedance (Model TBF-310) that is widely used in clinical settings and has good convergence with other methods.[8]

A chart review tool was developed to systematically extract data including age, height, sex, ethnicity, education, employment, number of children, age of onset of overweight, presence of overweight partners, frequency of eating out and fast food intake, alcohol and smoking habits, medications, and medical diagnoses. Laboratory and physical exam measures (eg, blood pressure, height, weight, and WC measured at the level of the umbilicus) were also reviewed. Other characteristics that were extracted from the charts included dietary habits, activity level and weight at 3 months after enrollment.

A trained research assistant under the supervision of the first author collected the data. Obesity was defined as BMI$\geq$30kg/m$^2$, which was obtained from the initial body composition after entering self-reported heights and measured weights. Cases were categorized as complicated vs uncomplicated obesity; a patient was categorized as uncomplicated obesity if he/she had no documented diagnoses or medication treatment for hypertension, diabetes, or hyperlipidemia, and no physical or laboratory findings suggesting these diagnoses.

## STATISTICS

Univariate comparisons were made utilizing chi square or grouped *t*-tests as appropriate using SPSS statistical software (Version 19). After finding a significant difference in age between the two groups, we additionally calculated ANCOVAs with age as the covariate for the main study outcomes.

## RESULTS

We reviewed a total of 168 charts of which 153 met obesity criteria. The majority of the obese patients were female (96%, $n=141$) and self-reported to be AA (86%, $n=135$). Eighty percent had at least a college education with 82% reporting professional or skilled employment.

Forty seven (30.7%) of the patients were uncomplicated (had no comorbid conditions). The patient demographics and clinical characteristics for the two study groups are shown in Table 1. The uncomplicated obese patients were, on average, younger than the group with comorbid conditions (35 years $\pm$ 10.6 vs 48 $\pm$ 12, $t=6.56$, $P < .01$). There were no significant differences between the groups' educational and occupational status, and level of typical physical activity. Mean values for BMI (38 $\pm$ 5.8 kg/m$^2$ vs 40 $\pm$ 7.6; NS) and WC (44 $\pm$ 13.8 inches vs 44 $\pm$ 6.6; NS) were similar. There were also no significant group differences when these analyses were adjusted for age.

Weight loss between groups was also similar with 31% of the uncomplicated obese and 32% of those with comorbidities achieving a $\geq$5% reduction in weight and similar average weight loss between the two groups (9.9 $\pm$ 10.4 pounds vs. 10.3 $\pm$ 12.4; NS).

**Table 1. Patient demographics and medical conditions**

| | Without Comorbidity (*n*=47) | With Comorbidity (*n*=106) | |
|---|---|---|---|
| | Mean (SD) | Mean (SD) | Significance |
| Age, years | 35 (10.6) | 48 (12.0) | $t=-6.56$, $P=.00$ |
| BMI, kg/m$^2$ | 38 (5.8) | 40 (7.6) | $t=-1.35$, $P=.18$ |
| Waist circumference, inches | 44 (13.8) | 44 (6.6) | $t=-.142$, $P=.89$ |
| Sex, % (*n*) | | | Fisher's Exact, $P=.35$ |
| Female | 96 (45) | 91 (96) | |
| Male | 4 (2) | 9 (10) | |
| Race/ethnicity, % (*n*) | | | $x^2=.52$, $P=.77$ |
| Black | 90 (42) | 87 (93) | |
| White | 4 (2) | 9 (9) | |
| Other | 6 (3) | 4 (4) | |
| Education, % (*n*) | | | $x^2=7.06$, $P=.07$ |
| <High School | 6 (3) | 0 (0) | |
| High School | 15 (7) | 19 (20) | |
| College | 43 (20) | 39 (38) | |
| Graduate School | 36 (17) | 42 (40) | |
| Missing | | *n*=8 | |
| Employment, % (*n*) | | | $x^2=16.67$, $P=.02$ |
| Unemployed | 22 (9) | 3 (3) | |
| Employed | 78 (32) | 95 (90) | |
| Retired | 0 (0) | 2 (2) | |
| Missing | *n*=6 | *n*=11 | |
| Physical activity, % (*n*) | | | $x^2=.57$, $P=.75$ |
| Sedentary | 66 (31) | 64 (66) | |
| Moderate | 26 (12) | 23 (24) | |
| Vigorous | 8 (4) | 13 (13) | |
| Missing | | *n*=3 | |
| Medical conditions, % (*n*) | | | |
| Hypertension | - | 70 (74) | |
| Diabetes | - | 17 (18) | |
| Hyperlipidemia | - | 51 (54) | |
| 3-month follow up | | | |
| Achieved 5% weight loss, % (*n*) | 31 (13) | 32 (31) | Fisher'sExact, $P=1.00$ |
| Missing | *n*=5 | *n*=10 | |
| Weight change at 3 months, lbs, mean (SD) | −9.9 (10.4) | −10.3 (12.4) | $t=.14$, $P=.89$ |

Further analysis of the diabetic group ($n=16$) showed significantly less weight loss at 3 months compared with non-diabetics ($n=119$) (5.8 ± 6.1 pounds vs 10.6 ± 12.0, $t=-2.6$; $P<.02$). The % of diabetics (16.7%) vs nondiabetics (33.3%) achieving 5% weight loss at the 3 month period was not statistically significant. There was no difference in weight loss between the hypertensive patients ($n=63$) and those without hypertension ($n=72$) (9.7 ± 11.9 pounds vs 10.3 ± 11.3; NS) nor was there a difference in the % of those achieving 5% weight loss at 3 months (31.4% for hypertensive patients and 31.2% without hypertension).

## DISCUSSION

Thirty-one percent of our obese population had no documented comorbidities and that is consistent with findings from studies of other ethnic groups.[9] The uncomplicated obese were younger than the group with comorbid conditions but did not differ in WC even when the comparison was adjusted for age. This finding may indicate that the younger MHO have not had sufficient time to develop cardiovascular risks. The literature, however, remains inconclusive about the clinical significance of WC in AA. Our study findings support the possibility that the WC cut off point that portends CV risk in AA women may be different from the risk threshold for women of European descent. This possibility is consistent with findings of AA women who demonstrate larger amounts of subcutaneous waist fat compared to the harmful pro-inflammatory visceral fat.[10,11] Continued research is needed to define physiologic differences inherent to the uncomplicated obese which could explain this cardio-protective genotype. Our other main finding suggests that the presence of medical conditions does not predict motivation for weight loss as both groups had similar short-term weight loss. It will be important for future studies to determine if the lack of relationship between the presence of health conditions and weight loss achieved generalizes to other populations.

It is interesting to note the greater weight loss in the non-diabetic as compared to the diabetic. This raises the question of whether there are innate differences in the ability to lose weight or adhere to a diet based on the presence of diabetes. Studies looking at dietary compliance in cardiovascular patients conclude that reduced compliance was associated with a lower level of education, socioeconomic status, and lack of understanding of the illness.[12] Higher levels of emotional dietary support from family members were associated with better adherence to short term dietary compliance in a group of AA adolescents at risk for HTN.[13] Improved compliance and weight loss success has also been shown in studies where there

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was use of meal replacement products, and structured meal plans.[14–16] A clearer understanding of factors affecting dietary compliance and weight loss within specific medical comorbidities may help to guide treatment regimens for long term weight loss success.

Our study was limited by being retrospective, and a modest size sample that was treatment seeking and could afford the program fees. Lack of direct laboratory measurements of metabolic indices (eg, lipid panel and insulin sensitivities) is also a limitation; however, we were able to obtain essential diagnoses reliably with our chart review.

There are few studies that assess medical weight loss in MHO AA and it is important to better understand this phenotype and its clinical relevance. As the rate of obesity and its associated health care costs continue to rise, studies are needed to explore whether there are significant metabolic benefits, as well as other health and social benefits of weight loss in this subset of the obese population in minorities and all groups.

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