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Original Research Paper

General Medicine

"STUDY OF ANTHROPOMETRIC MEASUREMENTS IN CLINICAL CASES OF OBESITY"

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ABSTRACT

BACKGROUND: The study of the measurement of the human body in terms of the dimensions of bone, muscle, and adipose (fat) tissue. Different anthropometric variables have been shown to be related to cardiovascular morbidity and mortality.[2] Of,these variables, body mass index (B.M.I.)

MATERIAL AND METHOD: This Prospective cross–sectional study was carried out in the Department of General Medicine; At All India Institute of Medical Sciences Patna. we studied 211 consecutive patients of obesity presenting in general medicine OPD and general medical wards having associated co- morbidity. All patients or their relatives provided valid informed written consent for participation.

RESULT: The above table shows the mean comparison of FBS, BMI, waist hip ratio, waist circumference, hip circumference, weight and age between presence and absence of CAD. The difference was found to be statistically significant for hip circumference ($P < 0.05$) with a larger hip circumference in CAD present patients in comparison to the CAD absent patients. While the difference in all the other parameters were found to be statistically not significant ($P>0.05$), showing that all the parameters were comparable.

CONCLUSION: Conclusion derived from the study conducted on 211 patients of diabetes mellitus type II and overweight W.C., WHR and BMI are important, simple, cost effective, anthropometric measurements. Hence we recommended that all patients of obesity visiting Medical OPD and admitted in medical wards should not only be assessed for associated co- morbidities but for time tested anthropometric measurements. Obesity measures are better predictors of CVD risk compared with general obesity measures in women.

The above table shows the mean comparison of FBS, BMI, waist hip ratio, waist circumference, hip circumference, weight and age between presence and absence of CVA. Statistically significant difference was seen in the waist circumference and WHR higher in patients with CVA in comparison to patients without CVA ($P < 0.05$). No statistically significant difference was seen in any of the parameters ($P>0.05$) between absence and presence of CVA, showing that all the parameters were comparable.

KEYWORDS : Aanthropometric, Clinical & Obesity, Epidemiology.

INTRODUCTION

Anthropometry is the study of the measurement of the human body in terms of the dimensions of bone, muscle, and adipose (fat) tissue. Measures of subcutaneous adipose tissue are important because individuals with large values are reported to be at increased risks for systematic hypertension, CAD adult-onset diabetes mellitus, gallstones, osteoarthritis, and other disease, and many forms of cancer. Anthropometric measurements B.M.I., waist circumference (W.C.), WHR and skin fold thickness are frequently used clinically for assessing obesity.[1]

Different anthropometric variables have been shown to be related to cardiovascular morbidity and mortality.[2] Of these variables, body mass index (B.M.I.) and waist circumference (W.C.), Hip circumference (H.C.) are amongst the most common. In addition, it has been shown that peripheral fat deposition is associated with less severe, and central obesity related to more severe, cardiovascular disease.[3,4]

It has been shown that anthropometric measurements, particularly waist circumference (W.C.) and B.M.I., are strongly associated with inflammation. Atherosclerosis is during recent years considered an inflammatory disorder, and known to be associated with multiple non- communicable diseases and anthropometric measurements have strong association, so it is important to study this correlation.[5]

MATERIAL & METHOD

This Prospective cross–sectional study was carried out in the Department of General Medicine, All India Institute of Medical Sciences Patna Bihar, Period of one year. We studied 211 consecutive patients of obesity presenting in general medicine OPD and general medical wards having associated co-morbidity. All patients or their relatives provided valid informed written consent for participation.

INCLUSION CRITERIA:- Patients having obesity/Overweight with associated co-morbid condition and willing to give consent.

EXCLUSION CRITERIA:- Patients with multiple systems disease, serious patients.

Prisoners and orphans were not included being dependent population.

Since hypothyroidism is mostly associated with obesity and form a separate class itself and lot of work has been done on it recently we have not included.

- BMI was calculated as weight in kg divided by the square of height in meters.
- Height was recorded by proper method with cms tape attached to wall.
- Weight machine was used.
- Waist circumference (W.C.) was measured at the midpoint between the iliac crest and the rib cage on the midaxillary line.
- Hip circumference (HC) was measured at the point yielding the maximum circumference over the buttocks to the nearest 1cm.
- Blood pressure was measured after a 15-min rest in the semi-sitting position with a mercury sphygmomanometer.

RESULTS

Table 1: Number Of Patients (n=211) According To Grade Of Obesity And Sex

Obesity class	Number of patients	Male	Female
Overweight	87(41%)	56(47%)	31(34%)

CLASS-1	65(31%)	40(33%)	25(28%)
CLASS-II	37(18%)	16(13%)	21(23%)
CLASS-III	22(10%)	8(7%)	14(15%)
Total patients	211	120(57%)	91(43%)

Table 2: Comparison of mean FBS, BMI, WHR, Waist Circumference, Hip circumference, Weight and Age in the presence and absence of CAD

Parameter	CAD Absent (Mean±SD)	CAD Present [Mean±SD]	't' Value	P value
Fasting blood glucose level	116.84 ± 13.18	120.85 ± 21.57	-1.640, df=208	0.103, NS
BMI	30.99 ± 4.53	31.10 ± 4.48	-0.161, df=209	0.872, NS
WHR	0.93 ± 0.03	0.93 ± 0.03	-1.177, df=208	0.240, NS
Waist Circumference	98.50 ± 8.55	96.94 ± 8.62	1.430, df=209	0.154, NS
Hip Circumference	101.34 ± 7.99	105.51 ± 7.61	2.366, df=209	0.019*
Weight	80.21 ± 12.23	80.21 ± 12.48	0.000, df=209	1.000, NS
Age	52.93 ± 12.68	52.54 ± 11.24	0.207, df=209	0.836, NS

The above table shows the mean comparison of FBS, BMI, waist hip ratio, waist circumference, hip circumference, weight and age between presence and absence of CAD. The difference was found to be statistically significant for hip circumference ($P < 0.05$) with a larger hip circumference in CAD present patients in comparison to the CAD absent patients. These obesity measures also had higher sensitivity and specificity in identifying women above and below the 20% treatment threshold than BMI.

While the difference in all the other parameters were found to be statistically not significant ($P>0.05$), showing that all the parameters were comparable.

Table 3: Comparison of mean FBS, BMI, WHR, Waist Circumference, Hip circumference, Weight and Age in the presence and absence of CVA

Parameter	CVA Absent (Mean±SD)	CVA Present [Mean±SD]	't' Value	P value
Fasting blood glucose level	118.13 ± 17.06	117.51 ± 12.46	0.236, df=208	0.814, NS
BMI	31.35 ± 4.68	29.96 ± 3.69	1.900, df=209	0.059, NS
WHR	0.93 ± 0.03	0.95 ± 0.03	1.097, df=208	0.022, *
Waist Circumference	97.20 ± 8.56	99.19 ± 8.75	2.704, df=209	0.012, *
Hip Circumference	107.73 ± 8.04	103.84 ± 7.77	0.685, df=209	0.494, NS
Weight	80.62 ± 12.55	78.88 ± 11.33	0.869, df=209	0.386, NS
Age	52.46 ± 11.83	54.00 ± 13.62	-0.772, df=209	0.441, NS

The above table shows the mean comparison of FBS, BMI, waist hip ratio, waist circumference, hip circumference, weight and age between presence and absence of CVA.

Statistically significant difference was seen in the waist circumference and WHR higher in patients with CVA in comparison to patients without CVA ($P < 0.05$).

No statistically significant difference was seen in any of the parameters ($P>0.05$) between absence and presence of CVA, showing that all the parameters were comparable.

DISCUSSION

In CAD group, Majority of male patients (65.78%) were seen with mildly deranged WHR and majority of female patients (47.82%) were seen with moderately deranged WHR. This shows that CAD occurs early in the derangements of WHR, but no patients of CAD with normal WHR. Also males were more affected with a small increase in WHR, so a good predictor. In The Canadian Heart Health Surveys significantly strong association found between waist circumference, WHR and CAD.[7]

In CVA patients with normal WHR males were 3.57 % (1 patient out of 28) and females were 0%. Majority of male CVA patients (67.85%) were seen with mildly deranged WHR and majority of female CVA patients (52.38%) were seen with moderately deranged WHR. A small no. patients having CVA were in severely deranged WHR category. This indicates mild to moderate derangement in WHR is a risk factor for CVA as also seen in CAD. With reference to a study published in stroke[8]: The relation between body fat distribution, as measured by the waist-to-hip circumference ratio, and the 2-year incidences of hypertension and stroke were examined in a cohort of 41,837 women aged 55-69 years.

CONCLUSION

Conclusion derived from the study conducted on 211 patients of diabetes mellitus type II and overweight W.C.,WHR and BMI are important, simple, cost effective, anthropometric measurements. Hence we recommended that all patients of obesity visiting Medical OPD and admitted in medical wards should not only be assessed for associated co-morbidities but for time tested anthropometric measurements. Obesity measures are better predictors of CVD risk compared with general obesity measures in women.

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