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Research Article

Prevalence of obesity in Chambal region and predictors of risk factors

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ABSTRACT

Background: The prevalence of obesity is alarmingly high, affecting both developed and developing countries of all socio-economic groups, irrespective of age, sex or ethnicity. As the prevalence of obesity increases so does the burden of its associated co-morbidities. The purpose of this study was to evaluate the prevalences of overweight and obesity in our region, study the association between family history of diabetes (FHD) and body mass index (BMI) and to assess the relationship between family history of obesity and body mass index (BMI).
Methods: A cross sectional population based study of 1017 randomly selected individuals was conducted. Pregnant patients and those with hypothyroidism, severe disability or severe psychiatric disturbance were excluded. Study included school going children, college going students, employees of medical college GRMC Gwalior and attendants of indoor and outdoor patients. Weight and height were measured and body mass index calculated. Patients with BMI > 23 kg/m2 were defined as overweight and those with BMI 27.5 kg/m^2 and above were labelled as obese as per the WHO recommendation for Asian population.
Results: A total of 1017 patients were included in this study. There were 573 (56.34%) males and 444(43.66 %) females. Overall prevalence of overweight was 251(24.6%) and prevalence of obesity was (25) 2.4%. 93 (33.69%) of those with BMI >23 had family history of obesity while the figure was 81 (10.93%) in those with BMI <23. p value =0.000. 30 (10.86%) with BMI >23 had family history of diabetes and 40 (5.39%) with BMI <23 had the family history of diabetes. p value-0.004.18 (22.2%) with BMI >23 consumed alcohol compared to 11 (7.5%) cases with BMI <23 who did not. P value 0.004.
Conclusions: The risk factors of overweight and obesity are multifactorial. The results show that the rise in the prevalence of overweight and obesity is accentuated by the presence of a positive family history of diabetes or obesity.

Keywords: BMI, FHD, Obesity

INTRODUCTION

The purpose of this study was to evaluate the prevalences of overweight and obesity in our region, to study the association between family history of diabetes (FHD) and body mass index (BMI) and to assess the relationship between family history of Obesity and body mass index (BMI).

Economic growth, rapid urbanization, and subsequent lifestyle changes has created epidemic of obesity. Hereditary factors may also partially contribute to obesity. Obesity, which refers to excess body fat, has become an important public health problem. As the prevalence of obesity increases so does the burden of its associated co-morbidities.

The prevalence of obesity is alarmingly high , affecting both developed and developing countries of all socio-economic groups, irrespective of age, sex or or ethnicity.[1]

It was concluded by the WHO Expert Consultation that the proportion of Asian people with a high risk of type 2 diabetes and cardiovascular disease is substantial at BMI's lower than the existing WHO cut-off point for overweight (=25 kg/m^2). The consultation identified further potential public health action points (23.0, 27.5, 32.5, and 37.5 kg/m^2) along the continuum of BMI. However, the cut-off point for observed risk varies from 22 kg/m^2 to 25 kg/m^2 in different Asian populations.[2]

The categories suggested for Asians by World Health Organization (WHO) are, less than 18.5 kg/m^2 (underweight); 18.5-23 kg/m^2 (normal); 23-27.5 kg/m^2 (overweight) and 27.5 kg/m^2 or higher (obesity).[2]

Both insulin resistance and abnormal insulin secretion appear very prematurely in obese patients, and both worsen similarly towards diabetes.[3]

The insights that improve obesity prevention and treatment will almost certainly benefit the incidence and care of type 2 diabetes.[4]

METHOD

This study was conducted in Department of Medicine, GRMC Gwalior between June 2010 to October 2011 after ethical clearance by ethical society of Gajra Raja Medical College (GRMC) Gwalior (Chambal Region). A cross sectional population study of 1017 randomly selected individuals was conducted. Pregnant patients and those with hypothyroidism, severe disability or severe psychiatric disturbance were excluded. Study included school going children, college going students, employees of medical college GRMC Gwalior and attendants of indoor and outdoor patients. Informed consent was taken by all individuals. This was followed by history taking with emphasis on family history of diabetes and family history of obesity. Weight and height were measured and body mass index calculated. Patients with BMI >23 kg/m^2 were defined as overweight and those BMI 27.5 kg/m^2 and above were labeled as obese as per the WHO recommendation for Asian population. A pretyped proforma consisted of questionnaires related to lifestyle, education, socio-economic factors, alcohol intake, medical history, family history of diabetes, obesity and other relevant diseases. Data's collected were analyzed using SPSS software.

RESULTS

A total of 1017 patients were included in this study. There were 573 (56.34%) males and 444 (43.66 %) females.

Distribution according to age group showed maximum number of patients 360 (35.3%) were in the age group 10-20 years. Table 1The age of the subjects ranged from 10 years to 75 years. Mean age was 31.7 years for males and 29.11 for females.

Table 1: Table showing distribution of cases according to age and gender.

Age (years)	Male 573	Bmi >23 and above	Female 444	Bmi >23 and above	Total
10-20	206	38 (18.44%)	154	24 (15.58%)	360
21-30	141	41 (29.07)	152	35 (23.02%)	293
31-40	72	16 (22.22%)	49	19 (38.77%)	121
40	154	65 (42.20%)	89	38 (42.61%)	243

Table 2: Table showing prevalence of overweight and obesity in males and females.

Weight	Male (573)	%	Female (444)	%	Total (1017)	%
Under weight	101	17.62	76	17.11	177	17.4
Normal	312	54.45	252	56.75	564	55.4
Over weight	150	26.17	101	22.74	251	24.6
Obese	10	1.74	15	3.37	25	2.4

Mean BMI was 21.36 for males versus 21.25 for females.

177 (17.4%) were underweight, 564 (55.46%) had normal BMI, 251 (24.68%) were overweight and 25 (2.46%) were obese (Table 2).

Overall prevalence of overweight was 251(24.6%) and prevalence of obesity was (25) 2.4%.

Prevalence of overweight was 26.17% in males and 22.74% in females and prevalence of obesity was 1.74% in males and 3.34% in females. Prevalence of overweight and obesity was maximum in the age group >40 years.

Gender wise distribution of weight revealed 150 (26.17%) cases were overweight males and 10 (1.74%) were obese males. Amongst females 101 (22.74%) were overweight and 15 (3.37%) were found to be obese.

93 (33.69%) of those with BMI > 23 had family history of obesity while the figure was 81 (10.93%) in those with BMI <23.p value =0.000 (Table 3).

Table 3: Correlation of overweight and obesity with family history of obesity.

Family history of obesity	Bmi>23 n= 276	Bmi<23 n=741
Yes	93 (33.69%)	81 (10.93%)
No	183 (66.3%)	660 (89.07%)

P- value-0.000.

30 (10.86%) with BMI >23 had family history of diabetes and 40 (5.39%) with BMI <23 had the family history of diabetes. p value-0.004 (Table 4).

Table 4: Correlation of overweight and obesity with family history of diabetes.

Family history of diabetes	Bmi>23 n=276	Bmi<23 n=741
Yes	30(10.86%)	40(5.39%)
No	246 (89.14%)	701 (94.61%)

P-value 0.004

18 (22.2%) with BMI >23 consumed alcohol compared to 11 (7.5%) cases with BMI <23 who did not. P value 0.004 (Table-5).

Table 5: Table showing correlation of overweight and obesity with alcohol.

Alcohol intake	Overweight and obese n=81	Non-obese n=145
Yes	18(22.22%)	11(7.5%)
No	63(77.7%)	145 (92.5%)

P value=0.004

DISCUSSION

Present study is a cross sectional study with an attempt to study the prevalence of overweight and obesity in Gwalior (Chambal) region as per WHO Guidelines for Asians. Overall prevalence of obesity was 25 (2.46%) and the prevalence of overweight was 351 (24.68%).

Prevalence of obesity increased with age and was maximum in the age group >40 years. (Table 1) These findings were consistent with the study by Al-Ajlan AR. where BMI increased with age.[5]

The risk of diabetes seen in individuals who were themselves overweight with a family history suggests that prevention of weight gain in this group may be an important preventive strategy. Individuals with a family history of diabetes are at increased risk of the metabolic consequences of obesity and form an easily identifiable group who may benefit from targeted intervention to prevent the development of obesity through increased physical activity. Health professionals should utilize every opportunity to include direct family members in health education.[6]

Those with a family history of obesity had BMI >23. (P value-0.000) (Table 3).

Individuals with a family history of diabetes had BMI >23. (Pvalue-0.004) (Table 4).

The relationship between obesity and diabetes is of such interdependence that the term 'diabesity' has been coined.[3]

Family history of obesity appears to be a main predictor of obesity. It represents common lifestyles, genetic susceptibility, shared environment, and interactions among them.

Diabetes, obesity and family history has striking positive association, evident from the high average percentage of body fat in the first degree relatives of type 2 diabetics.[7]

Family history of diabetes was shown to be related to overall obesity but not to abdominal adiposity per se.[8] Family history of type 2 diabetes was associated with both increased risk of becoming overweight/obese and with a greater susceptibility to the negative consequences of increasing body fat, probably as a consequence of an increased propensity to accumulate ectopic (non-subcutaneous) fat.

Family history of diabetes, gestational diabetes, and BMI were associated with children's overweight status.[9]

The risk of obesity was increased among children with family history of diabetes or obesity, and among those who had low physical activity.[10]

Physical activity should be encouraged among normal weight women of reproductive age as well as those who are overweight or obese, as low physical activity is a risk for transitioning from normal to overweight status. Younger overweight women are particularly at risk for transition to obesity.[11]

In our study the correlation of alcohol consumption with BMI >23 was significant (p value 0.004) which is in agreement with a report which suggests that alcohol could contribute to obesity.[12]

CONCLUSION

The risk factors of overweight and obesity are multifactorial. The results show that the rise in the prevalence of overweight and obesity is accentuated by the presence of a positive family history of diabetes and positive family history of obesity.

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