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Prevalence of overweight and obesity among Bengalee urban adult men of North 24 Parganas, West Bengal, India

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Abstract

Obesity is the most common nutritional disorder in the developed as well as developing countries. It is the result of an incorrect energy balance leading to an increased storage of energy mainly as fat. At present, it is estimated that there are more than 250 million people world-wide who are affected by obesity, equivalent to 7% of the adult population. Certain detrimental effects to health are attributed to obesity and it may develop at any age in either sex. Several factors may contribute to the development of obesity. Regardless of its cause, obesity may be associated with a variety of risks. There are numerous studies worldwide that have dealt with obesity and its economic and health costs. The present investigation is an endeavor to understand the obesity situation among urban adult Bengalee Hindu men. It also attempts to compare the levels of overweight and obesity among adult Bengalee Hindu men with those reported in other studies from India and abroad. Result revealed that the overall frequency of obesity (BMI $\geq$ 30.00) in men is 3.33% but the frequency of overweight (BMI 25.00 - 29.99) is alarming (29.33%) among the studied sample. The study concluded that obesity is a growing problem even in developing regions like India.

Keywords: Adults, bengalee, BMI, obesity, overweight, urban, West Bengal.

Introduction

Obesity has emerged as the most prevalent serious public health problem of our time (Roberts and Mayer, 2000). It is a complex disorder, which is a detrimental to good health and well being. Obesity is the most prevalent nutritional disorder in prosperous communities and is the result of an incorrect energy balance leading to an increased storage of energy, mainly as fat. It is the most common nutritional disorder in Western countries and among the higher income groups in developing countries. The prevalence of obesity is increasing in most of the populations of world, affecting children, adolescents and adults. Kopelman (2000) suggests that obesity is now so common within the world's population that it is beginning to replace undernutrition and infectious diseases as the most significant contributor to ill health. Obesity is increasing at an alarming rate throughout the world. At present, it is estimated that there are more than 250 million people world-wide are affected by obesity, equivalent to 7% of the adult population. Thus, obesity should not be regarded simply as a cosmetic problem

affecting certain individuals, but a serious ailment that threatens global well-being (WHO, 2000). Overweight refers to increased body weight in relation to weight, when compared to the same standard of acceptable or desirable weight. Obesity is defined as an excessively high amount of fat or adipose tissue in relation to lean body mass (Stunkard and Wadden, 1993). Kopelman (2000) defines the term obesity as "excess fatness" or fatness leading to pathology. The amount of excess fat, its distribution within the body, and the associated health consequences vary considerably between obese individuals. Obesity may develop at any age in either sex and in as increasing health problem. Obesity develops over time and, once it develops, is difficult to treat. The excess of fat in men tends to accumulate in the upper abdomen. In women the favored sites for the accumulation of fat are the buttocks, hips and thighs (Bose, 1995). The site of fat accumulation is considered a predominant factor for metabolic disorders of obesity (Van Gaal et al., 1988). However, the overall incidence of obesity was found to be higher among women than men (Pi - Sunyer, 1994). Several reasons may contribute to the development of obesity. It is not a single disorder but a heterogeneous group of conditions with multiple causes. Recent epidemiological trends in obesity indicate that the primary cause of the global obesity problem lies in environmental and behavioural changes. Georges et al., (1991) suggest a larger role for socio-cultural factors in the patterning of body fat distribution. Mueller and Reid (1979) suggested that environmental factors such as nutrition, stress and exercise have significant effect on subcutaneous fatness. On the other hand, the role of inherited factors in the origin of obesity is anticipated but the genetic mechanism is not well defined. Whereas clear genetic effects exist, these are modified by environmental and behavioral factors (Pi-Sunyer, 1994). Thus, obesity is multifactorial in origin. In developed countries the occurrence of obesity is higher in the lower socio-economic groups, whereas in developing countries this relationship is reversed (Sobol and Stunkard, 1989). The worldwide obesity problem can be viewed as a consequence of the substantial economic, social and cultural problems now observed in developing and newly industrialized countries. In India the increased levels of obesity is primarily associated with the transition from rural to urban lifestyle. However, it is evident that this phenomenon is more profound among the urban populations in comparison to the rural ones (Venkatramana and Chengal Reddy, 2002). Regardless of its cause, obesity may be associated with a variety of risks. Obesity causes or exacerbates many health problems, both independently and in association with other diseases. It is related to the risk for developing non-insulin-dependent diabetes mellitus, hypertension, and cardiovascular disease (Smith et al., 2001). It also creates an enormous psychological burden. Thus, obesity is associated with a significant increase in morbidity and mortality. Anthropometrics plays an important role in the assessment of obesity in conjunction with other sophisticated techniques–viz., bioelectrical impedance analysis (BIA), magnetic resonance imaging (MRI), dual-energy x-ray absorptiometry (DEXA), isotope dilution, computed tomography (CT), hygrometry and ultrasound. In anthropometry, body mass index (BMI) is the most commonly used measure of overall obesity (generalized obesity) while circumferences and skin folds are measures of central obesity. BMI can be considered to provide the most useful, albeit crude,

population-level measure of obesity (WHO, 1995). In cross-sectional comparisons, BMI values may be used to estimate the prevalence of obesity within a population and the risk associated with it. It allows meaningful comparisons of weight status within and between populations and the identification of individuals and groups at risk of morbidity and mortality (Bose, 1995). For meaningful comparison between or within populations WHO (2000) advised the use the single BMI cut-off points. A BMI of ≥25 and ≥30 are now widely accepted as denoting overweight and obesity, respectively. It allows a firm basis for evaluating interventions. WHO recommended this classification of overweight and obesity for adult population according to BMI values which is age – independent and the same for both sexes.

There are numerous studies worldwide that have dealt with obesity and its consequences (WHO, 2000). Considering the economic burden and importance of overweight and obesity, documenting the patterns and trends in overweight and obesity in different Indian populations are of paramount importance. The present investigation is an endeavor to understand the obesity situation of adult Bengalee Hindu men. It also compares these rates in respect to Indian and global context.

Materials and Methods

Present study was conducted among urban adult Bengalee Hindu males residing at Hridaypur region within the Barasat Municipal area under the jurisdiction of Kolkata Metropolitan Development Authority (KMDA) in the district of North 24 Parganas, West Bengal, India. The study population of present investigation consisted of 300 males aged 20 to 50 years. The mean age of the population is 36.82 (sd +/- 9.25). Requisite information on socio-demographic profile was collected by interview schedule method. Two basic anthropometric measurements were taken for each subject. These antropometric measurements include height, weight. Body mass index (BMI) was calculated using the measurements mentioned above. Body mass index was computed using standard equation of (WHO, 2000). All the anthropometric measurements were made by investigators using standard anthropometric technique (Lohman et al., 1988). Height was measured to the nearest 0.1 cm using Martin's anthropometer and the body weight of the subject was recorded to nearest 0.5 Kg on weighing scale. Both for height and weight the subject were requested to remove their shoe and wearing minimum cloth. BMI is calculated by using two anthropometric measurements– height, weight. BMI is the ratio between body weight in kg and square of height in meter, expressed as BMI= weight/height (kg/m^2).

Data were collected on a pre-designated pro-forma and finally these data were transferred in to tabular form. The descriptive statistics like mean, standard deviation, were calculated using the specific statistical formulae.

Results and Discussion

Table 1 represents the frequency of obese and overweight subjects on the basis of body mass index. The frequency overweight is quite higher in the studied samples (29.33%). the number of overweight individuals are more in group III, the frequency is 30.68% and the frequency of overweight is low (23.60%) in group I. In group II the frequency is 30.68% that is closer to the frequency of group III. This indicates that the amount of excess fat deposition in the body increased with increasing age. The overall prevalence of obesity in the studied population is 3.33%. The frequencies of obese individuals are not far differed among the three age groups; however, group III has slightly higher

frequency (4.07%). The most important fact that derived from the result is that the frequency of overweight among the studied Bengalee population is at an alarming stage.

Table 1. Prevalence of overweight and obesity among the study population.

Age Group	Sample Size	Overweight (BMI 25.0-29.99)	Obese BMI>29.99
Group I (20-29 yrs)	89	21 (23.6)	2 (2.25)
Group II (30-39 yrs)	88	27 (30.68)	3 (3.41)
Group III (40+ yrs)	123	40 (32.52)	5 (4.07)
All age combine	300	88 (29.33)	10 (3.33)
*Percentages are presented in parentheses.			

Table 2. Obesity prevalence in different regions of India (BMI ≥ 30.0).

State/ Region	Location	Prevalence of Obesity (%)	
		Men	Women
Jammu & Kashmir	Kashmir valley*	7.01	23.69
Northern India	Urban slum**	13.30	15.60
Uttar Pradesh	Varanasi city***	-	30.24
West Bengal	Kolkata city****	11.89	17.45
West Bengal	Hridaypur*****	3.33	-
Source: *Zargar et al., 2000; **Misra et al., 2001; ***Bhadra et al., 2009; ****Present study.			

It may be noted that the estimation ids based on indirect technique, i.e., Anthropometry and international classification of adult overweight and obesity (WHO, 2000) cut-off points were utilized. The results of the present study are compared with adult populations of different regions of India to facilitate a relative evaluation (Table 2). However, studies from different parts of the country show a diverse scenario. Studies from North and North West Indian region demonstrated higher incidence of obesity reported by Asthana et al., 1998 (women=30.24%); Zargar et al., 2000 (men=7.01%, women=23.69%), Misra et al., 2001 (men=13.30%, women=15.60%) and Bhadra et al., 2009 (men=11.89%, women=17.45%). However, the present study among adult Bengalees reported 3.33% prevalence of obesity in men. But these findings implied that probably the use of WHO BMI cut-off point for obesity (BMI ≥ 30.0) may not be appropriate for use among diverse ethnic populations of India because its use may miscalculate the true prevalence of obesity. Since BMI is the most commonly used measure of obesity universally, we suggest that prospective ethnic-specific studies be undertaken on different populations to identify the most appropriate population level cut-off point for BMI. Alternatively, cross-sectional studies utilizing receiver operating characteristic (ROC) curves be undertaken to identified the most specific and sensitive cut-off point for BMI among these ethnic groups.

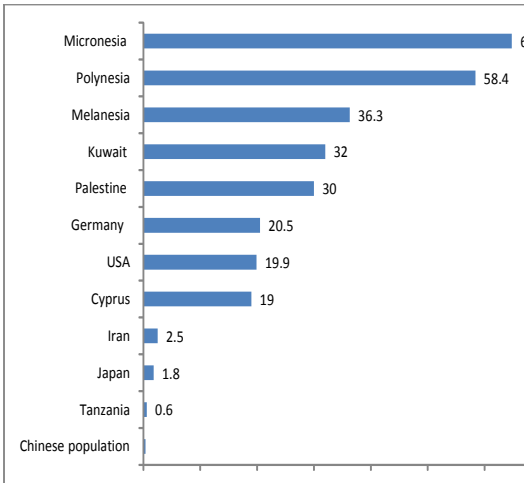

Fig. 1. Prevalence of obesity among adult men in different countries (source WHO 2000).

Since these curves can be studied based on cross-sectional data, it may be more advantageous compared to undertaking prospective studies which are both time consuming as well as expensive to undertake. Similar studies are needed on different Indian population of both sexes. In the global context (Fig. 1), it is clear that obesity has become the most prevalent public health problem irrespective of sex (WHO, 2000). Among men the highest frequency of obesity

is found among Nauruans (Micronesia, 64.80%) followed by Samoans (Polynesia, 58.40%) whereas the lowest rates are among the Chinese population (0.36%). Moderately high frequency of obesity is found in Melanesia (36.30%), Kuwait (32.00%), Palestine (30.00%), Germany (20.50%), USA (19.90%) and Cyprus (19.00%). On the contrary, insignificant prevalence of obesity is observed in Tanzania (0.60%), Japan (1.80%) and Iran (2.50%). Moreover, the results of the present investigation were in concordance with Indian studies, among North Indians reported by Misra et al., (2001) among Kashmiri population studied by Zargar et al., (2000) for both sexes, among Bengali population by Bhadra et al., 2009. In summary, the main findings of the present investigation may be summarized as follows: according to BMI, there is a moderate rate of obesity in the studied sample (3.33%). However, the frequency of overweight is alarming (29.33%) in the studied population.

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