ORIGINAL ARTICLE

PREVALENCE OF OBESITY IN MEN AND ITS RELATIONSHIP WITH DIET AND PHYSICAL ACTIVITY

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ABSTRACT

Background: Obesity is one of the major nutritional problems in the world as well as in Pakistan. The objective of this study was to find out the prevalence of obesity in males in six socio-economically diverse areas of Peshawar, and its relationship to energy intake and physical activity.

Material & Methods: Three urban and three rural areas were selected from District Peshawar to cover the diverse socio-economic variation. One hundred households were randomly selected from all the 4 areas. Male participants who gave consent and were above 30 years of age were selected. A total of 600 participants fulfilled the selection criteria and were included in the study. Data was collected using structured questionnaire and anthropometric indices were calculated using standard tools for measuring height, weight and body mass index.

Results: The prevalence of obesity in our male participants was 7% and overweight 34%. The average energy intake in urban areas was 2593±465 Kcal/day and in rural areas 2433±425 Kcal/day. The calories consumed consisted of 50-56% of fats, 32-33% of carbohydrates and 11-12% of proteins. Participants who did less physical activity were three time more likely to have a high Body Mass Index, and those who consumed more calories were twice as likely to have higher BMI than those who did not. Multivariate logistic regression showed that high energy intake, living in urban areas and sedentary lifestyle is positively associated with obesity.

Conclusion: The prevalence of obesity in males in our set up is 7% and overweight 34%. High energy intake, living in urban areas and sedentary lifestyles are positively associated with obesity.

Key Words: Obesity, Diet, Physical activity.

INTRODUCTION

Obesity is one of the major nutritional problems in the world as well as in Pakistan.[1] It is usually associated, but not synonymous with being overweight. Obesity is body weight more than 20% above the desirable weight whereas overweight is body weight more than 10% above the desirable weight due to fat deposition. Over weight could be due to muscles development.[2]

Hereditary studies indicate that genetic factors may be responsible for up to 70% of variation in Body Mass Index (BMI) of individuals in later life.[3] However obesity is a disorder of energy balance; intake and expenditure. An imbalance in favor of intake results in surplus calories that cause increased fat synthesis and deposition in the body.[4]

Researchers have long established a causal relationship of energy intake (diet) and expenditure (physical activity) with the occurrence of obesity, although a clear-cut quantitative relationship has been difficult to measure.[5] Nutrient intake has been cited by some as the major factor in causation of obesity while physical activity by others.[6,7]

During the past decade, several authors from the United States and United Kingdom have suggested that obesity epidemic has occurred despite minimal or no increase in per capita energy intake and/or energy from the food supply.[8,9] This has been described as the "American paradox" and cited as evidence that the obesity epidemic is due to decreased physical activity and not to changes in eating patterns. However new research has identified increased energy intake (diet) as the primary cause and physical inactivity as a contributing factor in the causation of obesity.[10-12]

World Health Organization (WHO) uses BMI calculated as kg/m$^{2.}$ It defines obesity as BMI e"30 and overweight as BMI e"25, the Indo-Asian specific definition of obesity is set as BMI= 27 and overweight as BMI = 23.[2,13] In strict medical terms obesity itself is a disease with implications as a single most common contributing factor to the development of the non-communicable diseases.[14] Obesity is considered to be a risk factor in a num-

ber of diseases including hypertension, diabetes mellitus, coronary heart disease, hyperlipidemia, respiratory disease, gout, hyperthyroidism, arthritis, gall bladder disease, intestinal disorders, post-surgical complications, gynaecological irregularities, and toxemia of pregnancy.[14,15]

The objective of this study was to find out the prevalence of obesity in males in six socio-economically diverse areas of Peshawar, and its relationship to energy intake and physical activity.

MATERIALS AND METHODS

This cross-sectional study was conducted in Peshawar over a six month period from January 2008 to May 2008. Three urban and three rural areas in Peshawar were specifically selected to cover the diverse economic variation in the area. One hundred households were randomly selected from each area. Men aged 30 years who gave consent were included in the study. A total of 600 male subjects fulfilled the selection criteria. A structured questionnaire was used to collect information on food intake and physical activity. The information on food intake was recorded for three days, and was translated into mean intake (calories) using Nutritive Value of Indian Food by the Indian Council of Medical Research (ICMR 1980). Physical Activity was divided into four categories using the guidelines for Normal and therapeutic Nutrition.[7]

The nutritional status was also assessed by anthropometric indices such as height, weight and BMI. The cut off points for obesity and over weight were 30 Kg/m^2 and 25 Kg/m^2 respectively using the WHO criteria.

The data was analyzed by Statistical Package for Social Sciences (SPSS) version 13.0 (SPSS Inc. Chicago, USA).

RESULTS

In our study the prevalence of obesity in males was 7% and overweight 34%. The average energy intake in urban areas of Peshawar was 2593$\pm$465 Kcal/day/person and in rural areas it was 2433$\pm$425 Kcal/day/person, and the respondents in urban areas of Peshawar consumed 160 Kcal/day/person more calories than respondents in rural areas. Calories consumed constituted of 11-12% of proteins, 32-33% carbohydrates and 50-56% fats. (Table-1)

Participants who did less physical work were almost three times more likely to have higher BMI than those who did heavy physical activity. Participants who had higher energy intakes were twice as likely to have higher body mass index. (Table-2)

Table-1: Mean macronutrients intake and their energy contents in Peshawar. (n= 600)

Area	Macronutrients Intake			Energy Intake* (kcal)	Relative Contribution of Macro nutrients to Energy Intake		
	Protein (g)	Fat (g)	Carbohydrate (g)		Protein (%)	Fat (%)	Carbohydrate (%)
URBAN							
Hayatabad	76	93	365	2602 ±477	12	32	56
Cantt. Area	74	92	356	2546 ±463	12	32	56
University Town	79	95	364	2630 ±456	12	32	56
Mean	77	93	362	2593 ±465	12	32	56
RURAL							
Palosi	69	88	342	2439 ±428	11	32	56
Sufaid Dehri	72	90	358	2533 ±449	11	32	56
Nowa Kaley	65	85	326	2326 ±398	11	33	56
Mean	69	88	342	2433 ±425	11	32	56
Peshawar	73	92	352	2522 ±449	12	33	56

*Mean ±SD

Table-2: Risk of obesity with Energy intake and Physical work.

Dependent variable	Independent variable
BMI	Energy intake Odds Ratio 2.2 (1.4 – 3.4)
BMI	Physical work Odds Ratio 2.8 (1.6 – 4.9)

Table-3: Multivariate logistic regression model of factors associated with obesity in Peshawar. (n=600)

Variables	Adjusted odds ratio	95% Confidence Interval
Energy Intake		
≤ 2400 k.cal/day	1.0	—
> 2400 k.cal/day	2.2	1.4-3.4
Activity level		
Heavy	1.0	—
Moderate	2.6	1.6-4.4
Light	2.8	1.6-5.2
Sedentary	3.2	1.3-8.2
Average daily intake		
Rural population	1.0	—
Urban population	1.60	1.0-2.6
Physical activity		
Yes	1.0	—
No	2.8	1.6-4.9

Multivariate logistic regression suggests that higher energy intake, sedentary life style, living in urban areas and physical inactivity are significantly associated with increased risk of obesity. (Table-3)

DISCUSSION

In our study the prevalence of obesity in men was 7%, whereas Pakistan National Survey (PNS) reported it to be 16% for men.[16] Our study also showed that 34% of the subjects were overweight; this was similar to that reported by PNS. However the Metroville study in Karachi (2006) reported that 34% of men in the lower socio-economic group were obese/overweight. Our study supports both the findings of the PNS and the Metroville study with respect to overweight men; however we found that the prevalence of obesity was lower than both these studies. This could be due to the fact that the Metroville study places obesity and overweight people in a single category. A study conducted by Aga Khan University (2006) found the prevalence of obesity to be similar to that reported in our study, they also found that factors independently associated with overweight and obesity were age, urban residence and high economic status.[17]

Reddy also attributed the rapid acquisition of adverse lifestyle to the rising prevalence of cardiovascular disease and risk factors such as obesity.[18] The underlying determinant of such risk factors were smoking, physical inactivity, improper diet and stress. In our study, we observed that high calorie intake and physical inactivity leads to increase in BMI.

A review on the evidence on diet and nutrition causes by Swinburn et al[19] state that risk factors for obesity were sedentary lifestyle and a high intake of energy dense micronutrient poor foods. Our study also showed that the calories consumed were predominantly carbohydrates such as bread, rice and potatoes, and fat consumption was high as all foods were cooked in ghee or oil, this was also reported in a study conducted by Vyas in 2004. He found that Pakistani men and women had the highest energy intake from carbohydrates.[17]

CONCLUSION

The prevalence of obesity in males in our set up is 7% and overweight 34%. High energy intake, living in urban areas and sedentary lifestyles are positively associated with obesity.

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