Obesity and Related Co-Morbid Conditions – A Retrograde Study

A Ghildyal*, SR Pandioskar**, HL Dhar***

Introduction

Obesity is fast emerging as the leading cause of mortality and prolonged morbidity in both developed and developing nations. It has been identified by the WHO as one of the most preventable causes of death second only to cigarette smoking. It has now become important that clinicians and paramedical staff make efforts to identify and treat obesity as early as possible. Obesity has become a national health problem in many countries around the world. In the United States, nearly 97 million adults are obese of which 4 million are severely obese and 1.5 million are morbidly obese. Despite public health efforts emphasizing low-fat diets and regular exercise, the prevalence of obesity is on the rise.¹

In a world where food supplies are intermittent, the ability to store energy in excess of what is required for immediate use is essential for survival. Fat cells residing within widely distributed adipose tissue depots are adapted to store excess energy efficiently as triglycerides and when needed release stored energy as free fatty acids for use at other sites. This physiologic system permits humans to survive starvation for several months. However the presence of nutritional abundance and sedentary lifestyles, influenced importantly by genetic endowments, this system increases adipose energy stores and produces adverse health consequences.

Definitions and Risk Factors: Obesity is a state of excess adipose tissue mass. In 1998, the National Institutes of Health established federal guidelines for the identification, evaluation and treatment of overweight and obese adults. Although not a direct measure of adiposity, the most widely used methods to gauge obesity is the body mass index (BMI), which is equal to weight per square meter of height. Overweight is defined as having a BMI greater than 25 kg per m², obesity is having a BMI greater than 35 kg per m² and morbid obesity is having a BMI greater than 40 kg per m² or BMI greater than 35 kg per m² with concomitant obesity related morbidity. Large scale epidemiologic studies suggest that metabolic and cardiovascular morbidity begin to rise when BMIs are ≥ 25 kg / m². Hence a BMI between 25-30 kg / m² should be viewed as medically significant and worthy of therapeutic intervention, especially in presence of risk factors such as hypertension and diabetes. Complications related to obstructive sleep apnoea are 12 to 30 fold higher in the morbidly obese than in the general population.² The most significant observation is that morbidly obese patients who are 20 to 40 years of age may experience a 12 fold reduction in life expectancy in comparison with age-matched control subjects. These observations confirm the concept that obesity has become a national health crisis.²

Aim

To document the prevalence of obesity and
accompanying co-morbid conditions in a private hospital setup.

**Material and Methods**

A retrospective study of hospital records of the last five years ('01-'05) was conducted in Bombay Hospital. Data was obtained from previous hospital records of 50 inpatients who were admitted at different times during the last five years. The patients were admitted in different departments with varied complaints ranging from morbid obesity requiring aesthetic contouring to obesity where the cause was not known. Maximum admissions were seen in the department of General Medicine and allied superspeciality branches (68%), followed by General Surgery and allied branches (16%), Paediatrics (12%) and OBGY (4%). Of the 8 patients admitted in surgery, 7 were for liposuction or lipectomy along with another operative procedure, 4 out of these seven were purely for liposuction or lipectomy.

The parameters assessed were the presence of hypertension, diabetes mellitus and other co-morbid conditions such as sleep disorders, asthma, hypothyroidism, etc, correlated to age and sex distribution. The statistical methods used to evaluate the data were mean, standard deviation and p value. All data is represented graphically.

**Observations and Results**

Maximum number of patients were in the age group of 51-60 (21.1%) with mean age being 44.79. Male:Female ratio was 56:72, with maximum number of females in the age group of 61-70 (Fig. 1). These findings are consistent with the findings of Misra et al in the International Journal of Obesity, where they found appreciable prevalence of obesity, dyslipidaemia, diabetes mellitus, substantial increase in body fat, generalized and regional obesity in females particularly in middle age.³

The average duration of stay was 4.15 days for males and 4.18 days for females and was found to be significantly higher in females, p=0.05 (Table 1). Rest of the parameters did not show any significant difference in males and females.

Eighty patients were admitted in the upper class wards (66.67) and 41 in the lower class wards (32%). Seven patients were admitted free of cost (5.5%). The presence of co-morbid conditions such as hypertension, diabetes, hypothyroidism, sleep disorders, etc., was seen in ninety two patients (71.8%). Out of these, the prevalence of hypertension was highest, i.e. it was seen in fifty five cases (43%, M:F=6:5). This was followed by diabetes (21.1%, M:F=11:16) and sleep disorders (14.1%, M:F=2:1). Almost thirty one patients (24.2%, M:F=15:16) had co-morbid conditions such as gall stones, migraine, acute embolism, menstrual irregularities, which have been classified as ‘others’ (Fig. 2).

<table>
<thead>
<tr>
<th>Table 1 : Basic parameters</th>
</tr>
</thead>
<tbody>
<tr>
<td>M (n=56)</td>
</tr>
<tr>
<td>Age (yrs) 40.08 ±17.96</td>
</tr>
<tr>
<td>Stay (days) 4.15 ± 4.58</td>
</tr>
<tr>
<td>Syst B.P 128.97 ± 26.19</td>
</tr>
<tr>
<td>Diast B.P 86.86 ± 10.02</td>
</tr>
<tr>
<td>Pulse 84.52 ± 22.09</td>
</tr>
</tbody>
</table>

In the Framingham, USA study, men were found to gain most weight between the ages of 29 and 35 yrs and women gain most between 45 and 49 yrs.⁴ The average duration of stay was 4.15 days for males and 4.18 days females and was found to be significantly higher in females, p=0.05 (Table 1). Rest of the parameters did not show any significant difference in males and females.
Hypertension showed maximum prevalence in men, i.e. thirty patients (54.5%), and had a peak incidence in the age group of 51-60 (33.3%). Sleep disorders were twice more common in men and peaked at the age group of 61-70 (41.67%). Women showed a higher prevalence of diabetes with 59.25% which peaked at the age group of 61-70 (50%).

Primary treatment of obesity was done in only twenty two patients (17.2%). Treatment was in the form of surgery. Liposuction alone was done in nine cases (41%), laparoscopic gastric banding in seven cases (31.8%), gastric bypass in two case (9.1%) and abdominoplasty was done in one case (4.5%). In three cases liposuction was done along with abdominoplasty (13.6%). Rest were treated for the presenting co-morbid conditions. None of the patients were given secondary treatment for obesity (Fig. 3).

Biochemical parameters assessed were serum total cholesterol, serum creatinine, serum total billirubin, LDH, CPK, SGPT, SGOT and blood sugar levels. But none of them were found to be significantly altered and were essentially within normal limits.

**Discussion**

Obesity has fast been elevated from a rare occurrence to a growing pandemic with epidemic proportions. It is a significant public health challenge as well as an enormous economic burden. Obese patients are at increased risk of illnesses such as coronary artery disease, hypertension, type 2 diabetes, respiratory insufficiency, venous stasis or thromboembolic disease, debilitating arthritis of weight bearing joints and depression as well as from uterine, ovarian, colon, breast and prostate cancer.

Once considered simply a condition of caloric intake exceeding energy expenditure, obesity has come to be known as a complex disease influenced by interaction of genetic, endocrine, metabolic and environmental factors.

In a Spanish study of obese paediatric population, it was found that nearly 18% of these children had metabolic syndrome.

Surgery has emerged as an effective long term treatment for morbid obesity. Bariatric operations allow for substantial weight loss, extended weight maintenance and control or reversal of obesity related health problems endured by the obese patient. In the Swedish Obese Subjects study, poor HRQL before intervention was dramatically improved after gastric restriction surgery, while only minor fluctuations in HRQL scores were observed in the conventionally treated controls. Peak values were observed in the surgical group at 6 or 12 months after intervention and a slight to moderate decrease at the two-year follow-up. In the follow up of the same study, it was found that intentional weight loss in the obese causes a marked reduction in the 2-year incidence of hypertension, diabetes and some lipid disturbances. The results suggest that severe obesity can and should be treated.
In the Livingston study of Surgical Management of Obesity, gastric bypass has proven to be very effective in sustained weight loss and control of type II diabetes. With 14-year followup, 82% of obese patients with type II diabetes were cured by gastric bypass.  

**Conclusion**

Obesity is a national health problem placing tremendous economic burden on the health care system. Surgery has become the most effective long-term treatment for morbid obesity. Bariatric operations allow for substantial weight loss, extended weight maintenance and control or reversal of obesity related health problems endured by the obese patient.

**Acknowledgement**

The authors hereby express their gratitude to Dr. SV Joshi and R Mansi for their valuable opinions and feedback. The authors also express their gratitude to Ms Lekshmi Aravind and Ramesh Lad for assistance in preparing this manuscript.

**References**


**Comparison of Weight-Loss Diets with Different Compositions of fat, protein, and Carbohydrates**

This randomized trial compared the effect of reduced calorie diets with various compositions of fat, protein, and carbohydrates on weight loss over a 2-year period. Compliance with the diets was not high. No significant differences in weight loss were observed among the various diets. Reduced-calorie diets appear to have similar effects on weight loss regardless of their particular compositions.