A STUDY OF THE RATE OF GASTRIC EMPTYING BY REAL TIME ULTRASONOGRAPHY IN EGYPTIAN PATIENTS WITH SIMPLE OBESITY

THESIS

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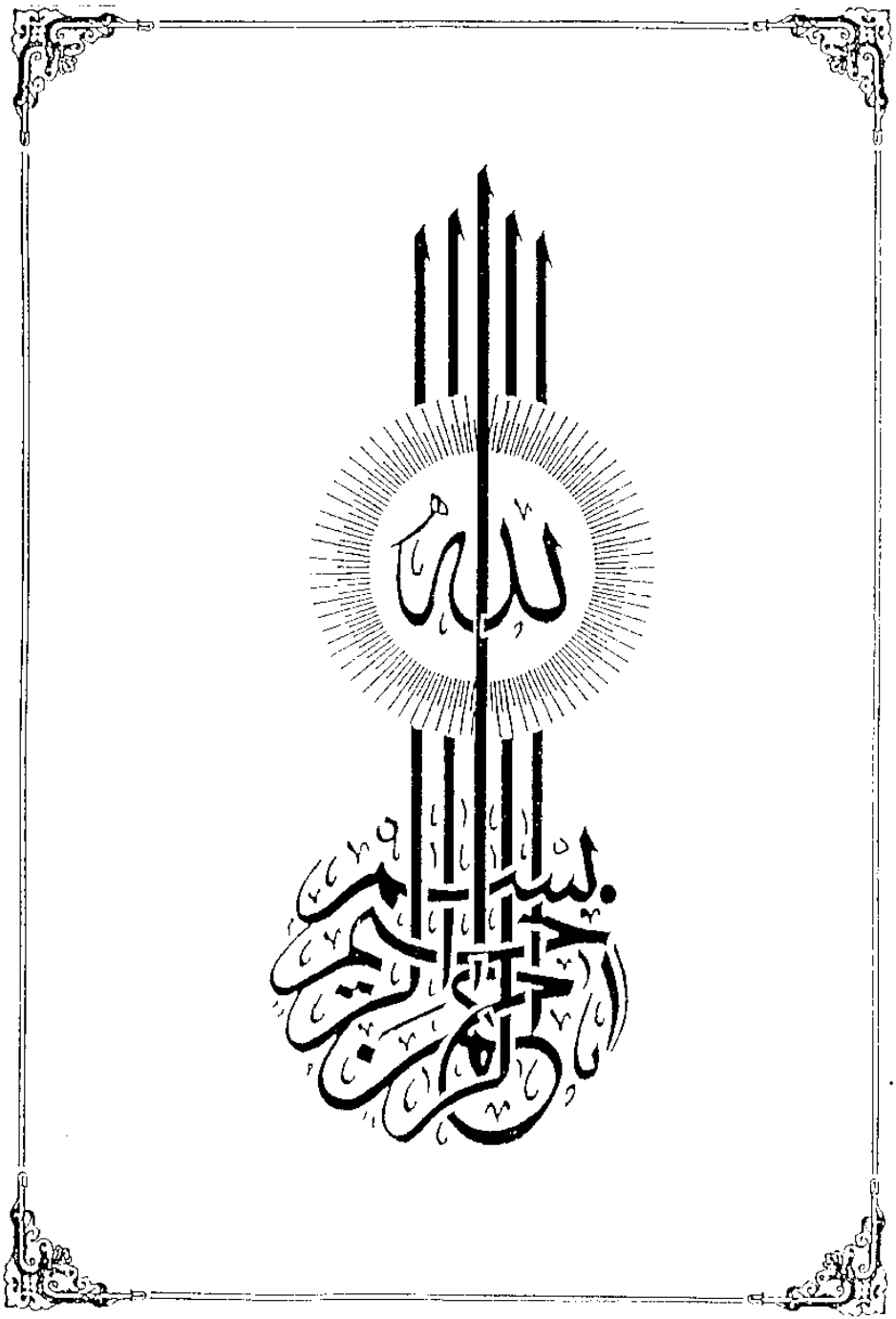

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Obesity is a common health hazard, besides the psychological burden, it increases the patient morbidity and mortality (James, 1976).

Simple obesity is due to disturbed energy balance resulting in excessive amount of fat in the body.

Increased food intake especially high caloric food is the stem cause of simple obesity (Hunt and Cash, 1978).

Gastric emptying was found to be delayed in anorexia nervosa, delayed emptying in this condition may give the patient the sense of satiety and hence decreases food intake (Robinson et al., 1988).

The aim of this study is to measure the rate of gastric emptying using real time ultrasonography in Egyptian patient with simple obesity (Bolondi et al., 1985).

REVIEW OF LITERATURE

DEFINITION OF OBESITY

Definition

Obesity is usually defined as the presence of an abnormally large amount of adipose tissue. When the amount of adipose tissue is very large, the diagnosis of obesity is trivial, and often is labeled "morbid obesity" (David and Gary, 1989).

So by definition, obesity exists when adipose tissue makes up a greater than "normal" fraction of total body weight. In male subjects aged 18, approximately 15 to 18 per cent of body weight is fat. The corresponding figure for females is 20 to 25 per cent. The percentage of body weight that is fat usually increases with age, but this may not be necessary. Obesity has been defined as body fat content greater than 25 per cent of total body weight for men and greater than 30 per cent for women (Bary, 1976).

Prevalence of Obesity

A recent study of nursery school children revealed 12 per cent were greater than 120 per cent ideal body weight based on height and 4.7 per cent were greater than 130 per cent (Ginsberg et al., 1981).

Braddon et al. (1986), had done studies to determine whether childhood obesity leads to adult obesity, by following of 3322 children in Great Britain from birth to age 36.

They found that obesity at age 36 years was of two types: 21 per cent were obese before age 11 and the remainder became obese during adolescence and early adulthood. This study demonstrated that, while being obese as child clearly is a risk factor for later obesity since most adult obese people have onset after childhood.

Using the body mass index weight/Height square, (W/H^2), it is possible to compare the prevalence of obesity in several countries. The prevalence of individuals with body mass index of 25 to 30 kg/m^2 especially at the age of 20 - 29 years old is almost identical in all populations. The higher percentage of men in the 25 to 30 kg/m^2 range results from the fact that median body mass index for women is 22 kg/m^2, while that for men is 25 kg/m^2. The prevalence of those with a body mass index above 30 kg/m^2, however, is higher in both the United States and Canada than Great Britain, Netherlands and Australia.

There are at least three possible explanations for the higher prevalence of obesity in North America:

(1) The higher proportion of automobiles may significantly reduce energy expenditure more than in other countries.

(2) There may be difference in quantity or quality of dietary intake.

(3) The higher rate of smoking may explain the lower rate of obesity outside North America.

(Kluth and Schubert, 1985)

Racial and socioeconomic conditions play important roles in the development of obesity. Excess body weight is 7 to 12 times more frequent in women from lower social classes than in women from the upper social classes, because women from lower social classes depend mainly on carbohydrate because of their low income and at the same time they can not afford buying protein expensive foodstuff (Goldblatt et al., 1965).

Although the prevalence of over weight is about the same for American black and white men, but black women have a much greater prevalence of overweight than white women. Women below the poverty line also had higher prevalence of overweight than women above the poverty line making it difficult to determine whether it is only the socioeconomic factor responsible for this prevalence or or it is even due to the race (Van Itallie and YOung, 1984).

CLASSIFICATION OF OBESITY

Obese individuals can be classified in several ways (George and Bary, 1989).

(1) The anatomic characteristics of adipose tissue.

(2) The age at onset of the obesity.

(3) The etiological factors.

1. Anatomic Characteristics of Adipose Tissue

The anatomic classification based on the number of adipocytes and regional distribution of fat.

A. Number of Fat Cells

The upper limits of normal fat cells numbers range from 40 to 60 x 10^6 cells in adult. The number of fat cells increases most rapidly during late childhood and puberty but may increase even in adult life. An increased total number of fat cells, "hypercellular", usually is present in individuals who are more than 75 per cent above their desirable weight [Fig. 1] (Hirsch and Batchelor, 1976).

When the onset of obesity is during adult life. It is called "hypertrophic obesity" and mainly involves enlargement of adipose tissue cells with lipids. Hypertrophic obesity tends to correlate with an android or truncal fat distribution, and often is associated with metabolic disorders such as glucose intolerance, hyperlipidism, hypertension, and coronary artery disease (Kissclbach et al., 1982).

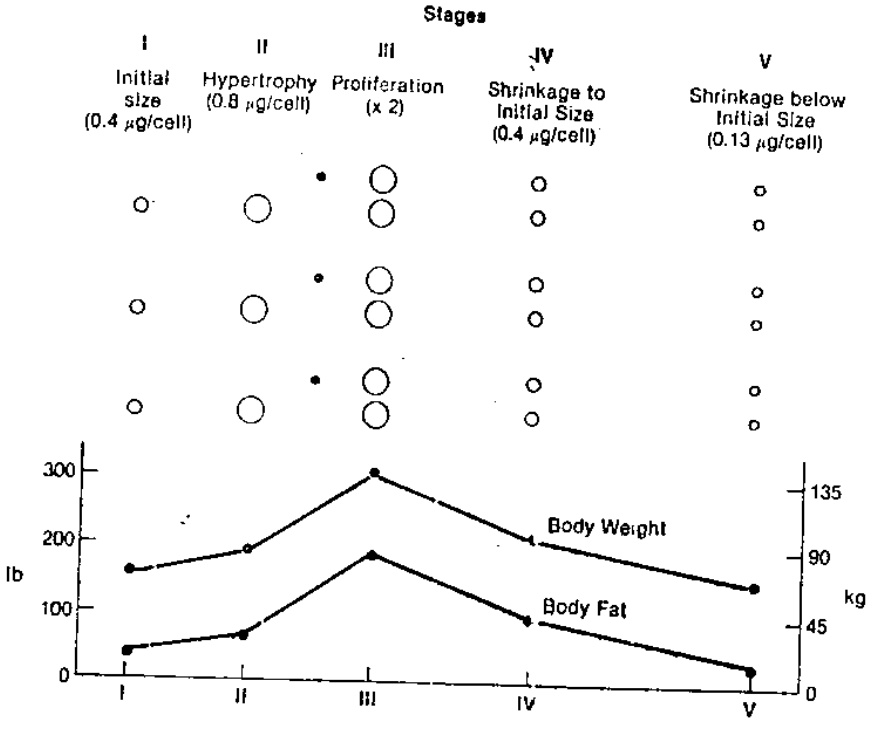

Fig. (1) Fat cell hypertrophy, proliferation, and shrinkage to and below initial size. (Cecil, 1988b).

B. Fat Distribution

Fat distribution can be estimated by skinfolds, by circumferences, or by sophisticated techniques employing ultrasound, computed tomography, or magnetic resonance imaging. A widely used technique estimates central fat from the ratio of the circumference of the waist to that of the hips.

A more sophisticated technique uses principal components analysis of skinfolds at several sites on the body. This method groups together those skinfolds that are best correlated and gives an estimate of total fat, central fat, and peripheral fat (Ducimitre et al., 1986).

2. Age at Onset of Obesity

It is found that obesity can begin at any age. Birth weight of children who will become obese later in childhood has the same frequency distribution as those who will maintain normal weight in later life (Bary, 1976).

The first appearance of obesity is in infancy when body fat rises rapidly. During the first year of life, the size of fat cells increases nearly two-folds but there is no measurable increase in the number of fat cells (Bary, 1982).

Mossbery (1948), found that obesity in the first year of life was a relatively poor guide to the likelihood of becoming obese later. A second period of childhood obesity is between the ages of 4 and 11 years. When obesity appears in this age group, there can be a progressive deviation of body

weight from the upper limit of normal for height age. This may be called "progressive obesity".

A. Childhood Onset Obesity

Childhood obesity does not necessarily predict obesity in adult life. A recent prospective follow-up over 36 years pointed up the variability in body weight with age (Braddon et al., 1986), drew several important conclusions:

(1) There was a subgroup of about 25 per cent of individuals who were obese in both childhood and adult life.

(2) The remaining 75 per cent of obese 36 years old first became obese in adult life and could not be predicted from weights before age 20.

Those individuals who became obese between age 11 and 36 often were not the most over weight in childhood.

B. Adult-Onset Obesity

Most obesity develops after the end of puberty. The early years of adult life are important for development of obesity in both men and women.

Mc Keoun and Record (1957), found the woman who becomes pregnant will be several kilograms heavier 2 years after pregnancy than woman who was not pregnant.

For men, the transition from the active life style to a more sedentary style of the early adult years is associated with weight gain. There is clear evidence from the Framingham study and from induction statistics from the