

OBESITY AND HEART DISEASE: SKEPTICISM OR REALITY?

The Skeptik 2013;3:117-122

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Summary

According to the American Heart Association, obesity is associated with numerous comorbidities such as cardiovascular diseases (CVD), type 2 diabetes and hypertension. Obesity is associated with an increased risk of morbidity and mortality as well as reduced life expectancy. On the other hand, there is a place for skepticism. How is it possible that in USA, beside rapid increase in obesity prevalence, cardiovascular mortality has decreased, and the life expectancy has increased by almost 5 years during the period of the past 20 years? Obese patient are more likely to survive a heart attack at year one than are patients with a normal body weight. The aim of this paper is to solve these paradoxes.

Text

Obesity is defined by body mass index (BMI) = body mass divided by the square of the height - kg/m². The WHO regards a BMI of less than 18.5 as underweight, while a BMI greater than 25 is considered overweight and above 30 is considered obese.

<u>Category</u>	<u>BMI range – kg/m²</u>
Very severely underweight	less than 15
Severely underweight	from 15.0 to 16.0
Underweight	from 16.0 to 18.5
Normal (healthy weight)	from 18.5 to 25
Overweight	from 25 to 30
Obese Class I (Moderately obese)	from 30 to 35
Obese Class II (Severely obese)	from 35 to 40
Obese Class III (Very severely obese)	over 40

Obesity is currently a common health problem in westernized societies. It has adverse effects on several cardiovascular disease (CVD) risk factors. Enormous weight gain (body mass index BMI \gg 30) is associated with increased arterial pressure, negative effects on plasma lipids composition - increase of triglycerides and decrease of the cardioprotective levels of high-density lipoprotein cholesterol-HDL. Obesity is the major contributor to type 2 diabetes and to metabolic syndrome, which are associated with high levels of inflammation. Data from Framingham Heart Study have indicated that obesity is an independent risk factor for major CVD events in men and, particularly, in women.

1. Skeptic aspects

Contrasting trends in obesity with CVD mortality in USA

How is it possible that in USA, beside rapid increase in obesity prevalence, cardiovascular mortality has decreased, and the life expectancy has increased by almost 5 years during the period of the past 20 years? In the year 1950 the adult obesity prevalence was less than 10%, in 1980 it was 20% and in 2000 30% - **Fig.1**.

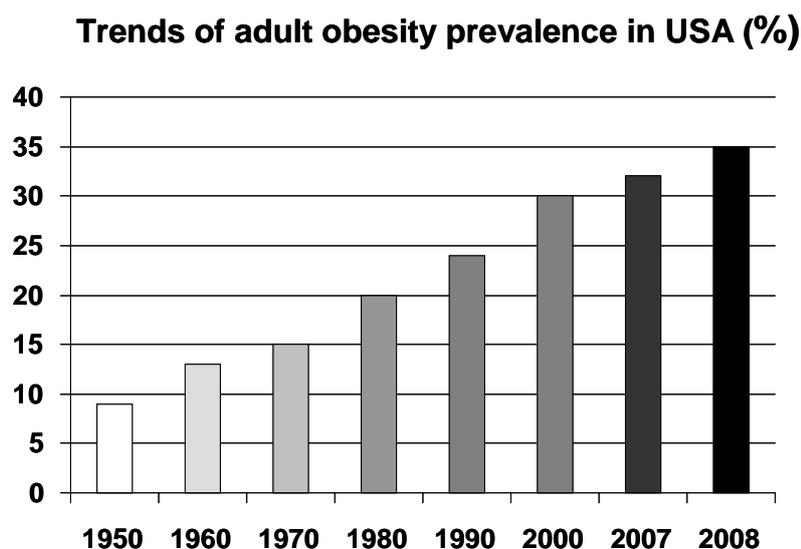


Fig. 1. The incredible increase of adult obesity in United States. According to (1-3).

Nowadays, only one third of adult Americans has normal healthy weight, one third suffers from overweight, and one third is obese. On the other hand, the US statistics confirm another surprising fact: number of deaths caused by cardiovascular disorders has decreased - **Fig. 2**. In 1950 the CVD mortality was almost 600/100 000, in 1970 it was 500/100 000, in 1990 slightly over 300/100 000 and now it is under 200/100 000.

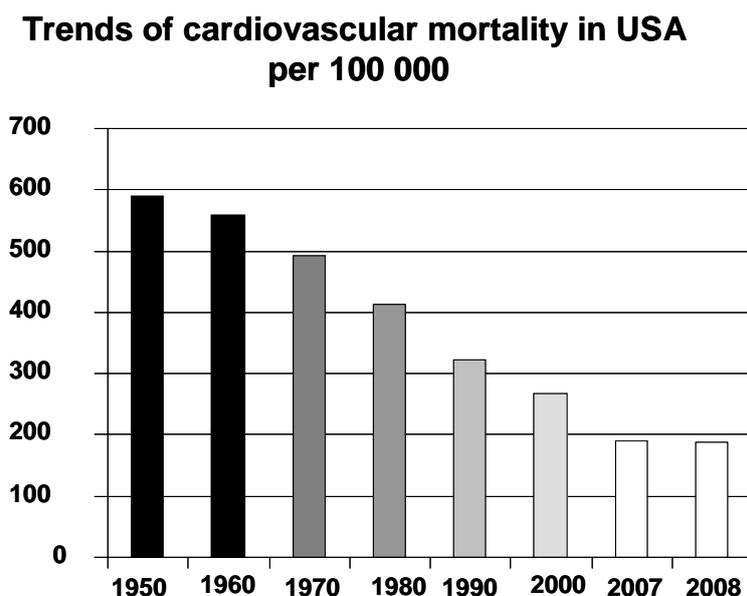


Fig. 2. Very significant decline of CVD mortality in USA. According to (1-3).

National Health and Nutrition Examination Survey (NHANES) has shown a decreased incidence of cardiovascular risk factors except for diabetes during the last 40 years. The growing use of medications for hypercholesterolemia (especially statins) and hypertension control are believed to be the main reasons of the improvement. Paradoxically, the most remarkable decreases in cholesterol level, high pressure and smoking were observed in individuals with obesity, possibly as a result of extended medical care.

Proposition: Extended medical care of patients suffering from obesity can explain this paradox (increase in obesity, decrease in cardiovascular risk). However, only rich countries can carry out such a solution. Prevention of obesity would be a better solution for the population.

Obesity paradox in heart attacks

Several studies have described an "obesity paradox" with heart failure, whereby higher body mass index (BMI) is associated with lower mortality (4-9). There appears to be an obesity paradox among patients after acute myocardial infarction such that higher BMI is associated with lower mortality, an effect that was not modified by patient characteristics and was comparable across age, sex, and diabetes subgroups.

A newly published meta-analysis involving two studies finds that obese patient are more likely to survive a heart attack at year one than are patients who have a normal body mass index (10).

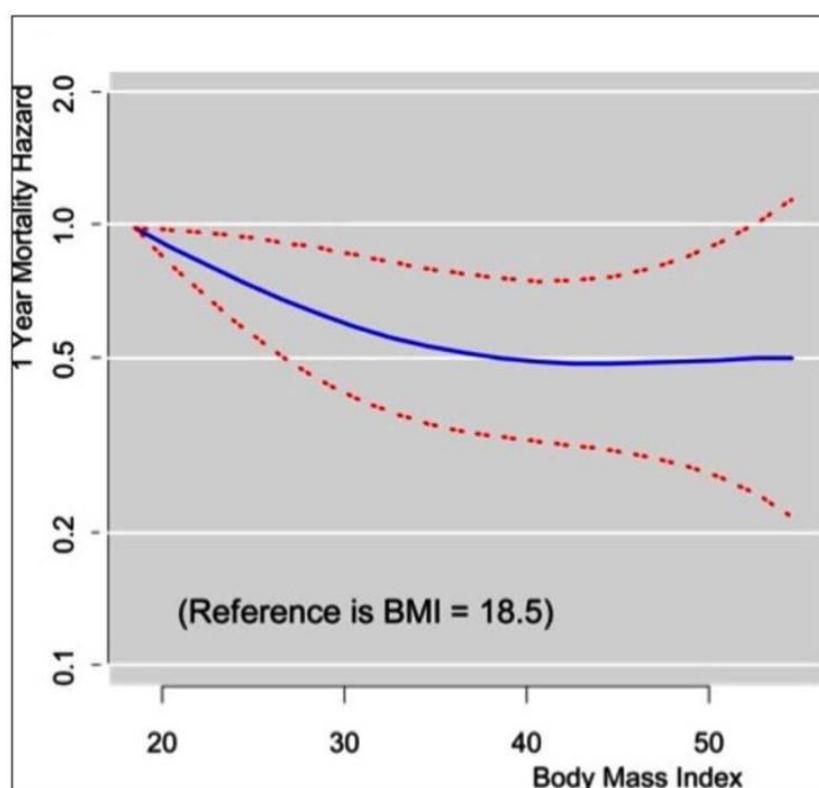


Fig. 3. Adjusted 1-year mortality as a function of body mass index with 95% confidence intervals. The results show that a patient's risk of mortality from a heart attack is inversely related to weight . According to Bucholz et al. (10).

In other words, the results show that a patient's risk of mortality from a heart attack is inversely related to weight. Those who were obese had

the lowest mortality rate from a heart attack: 4.7 percent. Those who were overweight had a 6.1 percent mortality rate, and those with normal weight had a 9.2 percent mortality rate. This is a paradox. It's logical to assume the higher the weight the higher the risk of mortality, but that isn't the case.

Proposition: This effect may occur because obese patients seek medical attention with their symptoms earlier than normal weight patients. Obese patients may have a heightened awareness of their heart attack risk.

2. Reality

Obesity is becoming widespread enough to generate an acceptable and misleading social status. By 2030, in the USA up to 86% of adults will be overweight or obese. Some selected statistical data based on the BMI indicating that overweight is not associated with increased mortality, provoked conceivable interest. Added to this is the observation that while the prevalence of obesity is dramatically increasing, the cardiovascular mortality and life expectancy in the European Union and USA has improved. Gaining excessive body fat is a continuous, frequently progressive process. Present obesity epidemic in childhood will manifest with deleterious consequences only in future years when adolescents reach adulthood. Prevention is thus essential even before the overweight sets in.

Improved life expectancy observed in large populations despite obesity epidemic, is a favorable medical success in the management of hypertension, of serum lipid disorders and diabetes. While encouraging, when it is observed in large population, it does not take away the potential health risk of a metabolic disorder in an individual who is obese. From our analysis of the effect of obesity on longevity, we conclude that the steady rise in life expectancy during the past two centuries may soon come to an end, unless effective population-level interventions to reduce obesity are developed. Children are a specific risk group. Childhood obesity has both immediate and long-term effects on health and well-being. The youth of today may, on average, live less healthy and possibly even shorter lives than their parents. It is critical to remember that never

before in the history have so many children been so heavy at such a young age. It is naive to believe that new drug therapy will enable an obese child to live a healthy life (11).

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