الجامعة السورية الخاصة
كلية الطب البشري
قسم الجراحة

Obesity

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Key Points

- Body mass index (BMI) determines the classification of obesity for clinical use.
- Waist circumference reflects the distribution of adipose tissue and helps determine obesity risk.
- Central obesity, reflected by a high waist measurement, is associated with more complications.

Demographics

- **Gender Differences**
- **Race and Ethnic Origin**
- **Socioeconomic Status**
- **Education Level**
- **Rural and Urban Differences**
- **Age**

Determinants of Obesity

- Genetics vs. Lifestyle
- Lifestyle Influences
- Endocrine and Metabolic Factors

Body mass index (BMI)

Body mass index can be calculated as :

wt (kg)/ht^2 (m) .

The problem of obesity

- Globally, *overnutrition* has now surpassed *undernutrition* as a public health concern
- 8.5% of the world population is overweight
- 5.8% underweight
- 2.3 billion adults are overweight and 700,000 million obese in 2015.
- Persons in the overweight category have 20% to 40% increased mortality,

Continue

- Workers with BMI over 35 kg/m^2 experienced a 4.2% health-related drop in productivity
- The medical consequences of obesity have been estimated to account for 9.1% of annual medical spending .

Assessment

- **BMI .**
- **Body fat percentage :** is a precise assessment of adiposity

Gender Differences

- Men are more likely than women to be overweight .
- Women are more likely to be obese.
- Men, however, are more likely to have central obesity, associated with greater health risks.

Socioeconomic Status

- The prevalence ranges from approximately 2% in the least developed countries to over 30% in the most developed countries.
- In developed countries, lower socioeconomic status is associated with an increased risk.

Education Level

Education level is inversely related to the risk of obesity .

Rural and Urban Differences

- Analysis data shows that the prevalence of obesity is greater in rural than urban areas.
- Factors that reduce physical activity may play a role .

Age

- The increased prevalence of overweight is alarming in the pediatric population .
- More than 30% of children and adolescents are overweight or obese.

Determinants of Obesity
Genetic Factors

- Obesity results from the interaction of genetic makeup, environment, and lifestyle.
- Genetic factors are estimated to account for 30% to 40% of the variability in adult weight.
- Specific metabolic or endocrine disorders account for less than 1% of the obese population.

Determinants of Obesity
Modern Life Factors

- Obesity results from calorie consumption in excess of expenditure.
- The conveniences of modern life have led to a decrease in energy expenditure.
- A greater access to energy-dense food, along with other factors, has increased energy consumption.

Modulation of Appetite

- Leptin levels.
- Vagal afferent activity .
- Fluctuation in plasma glucose levels.
- Neuropeptides and monoamine neurotransmitters are also involved in appetite control.
- Some weight loss medications may affect appetite or satiety.

Medical Complications

- Hypertension
- Dislipidymia
- Type 2 Diabetes Mellitus
- Metabolic Syndrome
- Heart Disease
- Cancer
- Obstructive Sleep Apnea
- Pulmonary Disease
- Fatty Liver Disease
- Orthopedic Disorders
- Gallbladder Disease
- Psychological Impact
- Complications in Childhood and Adolescence

Hypertension

- Obesity is a risk factor for hypertension .
- Obesity associated with the increasing incidence of hypertension seen with aging.
- The obesity-related increase in blood pressure (BP) is associated with an increase in vascular resistance .
- The increased vascular tone may reflect increased sympathetic tone because of insulin resistance and the resultant increase in insulin levels

Dyslipidemia

Obesity is associated with

- Elevated triglyceride (TG) levels .
- Reduced high-density lipoprotein cholesterol (HDL-C).
- Increase in the more atherogenic, small, dense LDL particles.
- Obesity causes only a small mean elevation in total and low-density lipoprotein cholesterol (LDL-C) values.

Weight loss effect

- There is strong evidence that weight loss through life style measures will reduce Triglyceride and increase HDL-C levels.
- This weight loss is generally accompanied by a decrease in total cholesterol and LDL-C.

Type 2 Diabetes Mellitus

- The prevalence of type 2 diabetes mellitus (T2DM) increased from 4.9% in 1990 to 7.9% in 2000 ,This change has been clearly linked to the increase in obesity.
- The risk of T2DM is lowest below a BMI of 22 to 23 kg/m^2.
- At a BMI of 31, the risk for women was 40-fold greater than in women with a BMI less than 22 .
- For men the risk of T2DM above a BMI of 35 kg/m^2 was increased 60-fold. Up to 80% of cases of T2DM can be attributed to overweight and obesity.

Facts on T2DM

- There is a time delay of about 10 years between the development of overweight and onset of the diabetes .
- Insulin resistance and compensatory insulin secretion also increase.
- At some point, the body's ability to secrete insulin does not meet requirements, and blood glucose rises.
- Weight loss is recommended to lower elevated glucose levels in overweight and obese persons with T2DM.

Current status of Diabetes in USA 2017

- Research suggests that 1 out of 3 adults has prediabetes. Of this group, 9 out of 10 don't know they have it.
- 29.1 million people in the United States have diabetes, but 8.1 million may be undiagnosed and unaware of their condition.
- About 1.4 million new cases of diabetes are diagnosed in United States every year.
- More than one in every 10 adults who are 20 years or older has diabetes. For seniors (65 years and older), that figure rises to more than one in four.

Metabolic Syndrome

- BP elevation of at least 130/85 mm Hg . inches in men.
- Increased urinary albumin excretion .
- The presence of impaired glucose toleranc
- Serum TG level higher than 150 mg/dL .
- HDL-C level less than 50 mg/dL in women and 40 mg/dL in men .
- Fasting blood glucose level at least 110 mg% .
- Waist circumference more than 35 inches in women and 40 e or T2DM .

Risk of Metabolic Syndrome

- An estimated 40% of the U.S. population over age 65 meet the criteria for the metabolic syndrome.
- Increases the risk of T2DM .
- Hypertension .
- Coronary artery disease (CAD) .
- Cerebrovascular disease .

Cancer

- Cancers of many different primary sites were associated with obesity .
- It was estimated that overweight and obesity played a role in 14% of cancer deaths in men and 20% in women.
- One proposed mechanism for endometrial and breast cancer is an increase in circulating estrogen levels.
- Maintenance of a healthy weight throughout life may be one of the most important ways to protect against cancer. Adults should maintain BMI between 21 and 23.

Obstructive Sleep Apnea (OSA)

- The incidence of OSA is approximately 40% .
- . About 70% of OSA patients are obese.
- The increased risk may be related to increased neck circumference and pharyngeal fat deposits.
- Weight loss may benefit the OSA patient.

Pulmonary Disease

- It increases the work of breathing through a decrease in chest wall compliance .
- Reduction in respiratory muscle strength.
- Obesity increases pressure on the diaphragm.

Orthopedic Disorders

- Overweight children have an increased risk of slipped femoral capital epiphysis , genu valga pes planus , scoliosis .
- Association between obesity and degenerative joint disease particularly of the knee .

Management and Interventions

- Childhood Overweight and Obesity
- Management in Adults
- Setting Goals
- Diet
- Physical Activity and Exercise
- Behavioral Approaches
- Medications
- Complementary and Alternative Medicine
- Surgery

Management in Adults

- It is important to help patients become aware of the medical implications and to engage them in management.
- Prevention of weight gain with lifestyle therapy is indicated in any patient with BMI ≥25 .

Guidelines for Treatment of Obesity

- Diet .
- Physical activity .
- Behavior therapy
- Pharmacotherapy .
- Surgery .

Diet

- Total calorie intake must be reduced below energy expenditure for weight loss to occur.
- Low-carbohydrate diets .
- Satiety from fat are other possible mechanisms.

Physical Activity and Exercise

- The choice of exercise depends on individual interests .
- The goal should be 30 minutes .

Behavioral Approaches

- Self-monitoring .
- Identifying and avoiding environmental or social triggers
- Group support may be helpful .

Surgery

Mal absorptive :

- Jejuno ileal bypass .
- Biliopancreatic diversion .
- Duodenal switch

Restrictive :

- Vertical-banded gastroplasty
- Gastric banding .
- Gastric sleeve .
- Gastric plication .

Malabsorptive and Restrictive

Roux-en-Y gastric bypass

Restrictive Approach
تحديد الوارد

وضع بالون
في جوف المعدة

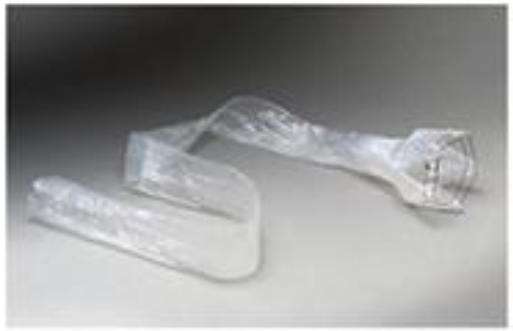
عملية قطع المعدة القائم

عملية وضع حلقة حول المعدة
قابلة للتصغير و التكبير

عملية تكميم المعدة

عمليـة طـي المعـدة

Mal absorption Approach
إحداث سوء الإمتصاص



التحويلة المعدية المعوية بواسطة منظار المعدة

التحويلة المعدية المعوية

تحويلة المعدة الصغيرة

إجراءات الجراحة الاستقلابية في معالجة الداء السكري ٢

التحويلة البانكرياسية العقجية

عملية تبادلية الإثنا عشري

إجراءات الجراحة الاستقلابية في معالجة فرط الشحوم

تفيد هذه العملية في معالجة زيادة الشحوم في الدوران الدموي و التي تؤدي بشكلٍ غير مباشر إلى تراجع في حالات نقص التروية الدموية في شرايين القلب و الشرايين المحيطية و بالتالي هبوط في الضغط الشرياني