

OBESITY

- AHA and NIH have recognized obesity as a major modifiable risk factor for CHD
- Obesity is a risk factor for development of hypertension, diabetes, and dyslipidemia
- Obesity also linked to insulin resistance, particular intraabdominal fat estimated by waist circumference

Standard Criteria for Body Mass Index (kg/m²)

- <18.5 - underweight
- 18.5 to <25.0 - healthy weight
- 25.0 to <30.0 - overweight
- 30.0 to <40.0 - obesity
- ≥ 40.0 - morbid obesity

Prevalence and Risk of Obesity

- NHANES III shows approximately 60% of men and 50% of women are obese or overweight, with 20% of men and 25% of women having a BMI of 30 or greater
- BMI 27-29 associated with a RR of total mortality of 1.6, BMI 29-32 RR 2.1, and BMI ≥ 32 RR 2.2 vs. BMI < 19 from Nurses' Health Study.

Obesity and CVD Risk

- In Nurses' Health Study, 14-year CHD risk increased about 3.5-fold for BMI >29 vs. <21 , weight gain of >20 kg associated with 2.5-fold increased risk.
- NHANES I follow-up showed a 1.5-fold greater risk of CVD in those women with a BMI >29 vs. <21 .
- A waist circumference of >35 inches in women, and >40 inches in men is also associated with greater CHD risk.

Obesity and Hypertension

- For every 1 kg/m² increase in BMI, increased risk of hypertension in Nurses' Health Study was 12%
- Those with a BMI >31 RR=6.3 for developing HTN compared with BMI <19.
- Intersalt study showed each 10 kg weight to be associated with an increase of 3mmHg SBP and 2.2mHg DBP.
- Increased insulin levels may explain relation of obesity with HTN, as compensatory increases in insulin are required to maintain glucose homeostasis, and insulin may elevate BP by affecting renal sodium retention, raising peripheral resistance

Obesity and Diabetes

- Obesity worsens insulin sensitivity, eventually exhausting pancreatic production of insulin, causing hyperglycemia and diabetes
- In Pima Indians (approx 50% of adults diabetic), incidence (per 1000 person-years) was 0.8 if BMI <20, but 72 if BMI >40.
- In Nurses' Health Study, BMI 23-23.9 showed a RR=3.6 for diabetes compared with BMI <22. Weight again was very important, with weight gain of 20-35kg associated with an 11-fold greater risk of diabetes, >35kg 17-fold.
- In Health Professionals Study among men, BMI >35 associated with RR=42 for developing diabetes.

Obesity and Dyslipidemia

- Obesity is associated with higher LDL-C and triglycerides, and lower HDL-C.
- Weight loss reduces triglycerides, increases HDL-C, and lowers LDL-C
- Rates of cholesterol synthesis correlate with excess body mass
- Data suggest a 10kg/m² increment in BMI is associated with a 3.2 mg/dl (women) to 10 mg/dl (men) lower HDL-C and about a 10 mg/dl greater LDL-C

Weight Control and Risk Reduction

- Weight loss improves BP, dyslipidemia, and diabetes.
- Clinical trials show normotensive overweight persons on a hypocaloric diet had a lowering of blood pressure and reduced incidence of hypertension. DASH diet high in vegetables and fruits showed significant lowering of SBP and DBP both in persons with and without HTN.
- Weight control also lessens hyperglycemia and has been shown to be related to reduced diabetes-related mortality and improvements in glucose and insulin levels.
- Among Indian coronary patients, those randomized to low saturated fat, high fruit and vegetable diet plus weight-loss advice, compared to usual care, showed a 50% reduction in cardiac events and 45% lower mortality in those who lost more than 5kg.

Weight Control and Risk Reduction (continued)

- Meta-analysis of 70 randomized controlled trials shows correlation between fall in LDL-C and amount of weight loss (Dattilo et al., 1992)
- Combined programs of weight loss and exercise are associated with greater increases in HDL-C and more significant loss of weight and fat.
- Findings are less consistent in women, however, and often LDL-C/HDL-C ratio worsens. While HDL-C is inversely related to CHD risk in populations, low rates of CHD are seen in populations with low-fat diets who have lower levels of both LDL-C and HDL-C.

Fat vs. Caloric Restriction

- While fat from calories has been reduced from 40-42% to 34% over the past 30 years, recent data show we consume more calories
- Message of caloric restriction needs to be coupled with dietary fat reduction, with greater emphasis on fruit and vegetable consumption
- Greater availability of low-fat and fat-free foods allows for substitution away from traditional higher-fat alternatives. Fat and calorie restriction needs to be individualized to patient need and risk-factor profile.

Hypocaloric Diets

- Such diets allow for 1000-1200 kcal/day, with very low-calorie diets providing only 400-500 kcal/day.
- Initial weight loss may be more rapid with the very low-calorie diet, but amount of weight loss over one year is similar with either plan and adherence better with the moderate diet.
- Combination of low calorie diet plus exercise is more successful than either strategy alone.