BMI and waist circumference

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Body mass index (BMI) and waist circumference are well known risk factors for cardiovascular diseases (CVD), but a new study reported in the *European Journal of Cardiovascular Prevention and Rehabilitation* today now concludes that these risk factors, when accurately measured by trained staff, can actually predict the risk of fatal and non-fatal disease. The findings, which emerged from a large prospective study of more than 20,000 Dutch men and women aged 20-65 years begun in 1993, show that the associations of BMI and waist circumference with heart disease are equally strong, and explain one half of all fatal and one quarter of non-fatal CVD in those who are overweight and obese.

Studies which have so far established the association between BMI and waist circumference as risk factors for heart disease have, say the investigators, been based on self-reported data, and these measures frequently underestimate the true prevalence of obesity. For a true estimation of the association, accurate "anthropometric" measurements are necessary. And this is what the present study did. The Monitoring Project on Risk Factors for Chronic Diseases (MORGEN) of the National Institute for Public Health and the Environment in the Netherlands professionally measured between 1993 and 1997 both BMI and waist circumference (as well as other variables) in a cohort of 20,500 men and women. And then all subjects in the study were linked to hospital discharge and national cause-of-death records - with only 556 lost to follow-up.

BMI measurements were defined according to WHO recommendations in three categories: normal as 18.5-24.9 kg/m^2; overweight as 25-29.9

kg/m^2; and obese as 30 kg/m^2 or more. Similarly, waist circumference measurements in men were defined as normal (102 cm); in women these measures were 88 cm respectively.

When age-adjusted BMI and waist circumference measurements were correlated with hospital records and cause-of-death statistics, results showed that in those categorised as overweight and obese around one half (53%) of all fatal CVD and one quarter (25-30%) of all non-fatal CVD were ascribed to the fact that the individual was overweight or obese.

The study also found that the overall risk of a first non-fatal CVD was ten times higher than that of fatal CVD.

Commenting on the public health implications of the study, principal investigator Ineke van Dis from the Netherlands Heart Foundation said: "Throughout Western Europe - as in the Netherlands - there has been a decline in cardiovascular mortality in recent years, which is reflected in a prevalence shift from mortality to morbidity. What this study shows is the substantial effect which overweight and obesity have on cardiovascular disease, whether fatal or non-fatal. In the near future the impact of obesity on the burden of heart disease will be even greater.

For consumer groups and our national heart foundations, these findings underline the need for policies and activities to prevent overweight in the general population. And I think that general practitioners and cardiologists can do even more to tackle these problems, especially in obese patients under 65 years, as highlighted in this study."

Extrapolating their study results to the general population, the investigators calculated (based on a population prevalence of overweight and obesity of 46%) that one third of all fatal CVD cases (and one in seven non-fatal cases) can be ascribed to overweight and obesity.

More information: Van Dis I, Kromhout D, Geleijnse M, et al. Body mass index and waist circumference predict both 10-year non-fatal and fatal cardiovascular disease risk in 20,000 Dutch men and women aged 20-65. *Eur J Cardiovasc Prev Rehabil* 2009; doi: 10.1097/HJR.0b013e328331dfc0

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