EDITORIAL

Obesity is an independent risk factor for death from CHD

AUTHOR
Dr Jennifer Logue
MB ChB MRCP
Clinical lecturer in metabolic medicine
BHF Glasgow Cardiovascular Research Centre, University of Glasgow

IT IS WELL ESTABLISHED THAT OBESITY IS ASSOCIATED WITH AN INCREASED RISK OF CHD. This is thought to be due to the links between high BMI and an increase in traditional risk factors such as raised blood pressure and cholesterol, and diabetes.[1,2] However, in our study recently published in *Heart*,[3] we wanted to see if there was a specific risk from the obesity itself, and if the risk of CHD events persisted even when traditional cardiovascular risk factors were accounted for.

To do this we used a cohort of men, mean age 55 years, BMI 18.5-39.9 kg/m^2, from the West of Scotland Coronary Prevention Study (WOSCOPS) with hypercholesterolaemia but no history of diabetes or cardiovascular disease. Men who suffered a CHD event in the first two years of the study were not included. We also excluded any individual who died within the first two years of follow up; this was to allow for the fact that pre-existing serious illness could have affected the baseline BMI (e.g. cancer cachexia).

'The risk of fatal CHD events was strongly associated with increasing BMI'

To examine the effects of obesity independently we built two statistical models. In the minimally adjusted model age, sex and statin treatment were adjusted for. In the maximally adjusted model, known CVD risk factors and deprivation were included.

A total of 6,082 men were included in the analyses. Over nearly 15 years follow up, there were 214 deaths from CHD and 1,027 non-fatal events. As there was a large number of events we were able to examine fatal and non-fatal CHD events separately.

When fatal and non-fatal coronary events were examined together there was an increased risk with increasing BMI, but this disappeared after adjustment for traditional risk factors and confounding factors.

However, when these events were divided into fatal and non-fatal, a difference appeared. Risk of non-fatal events was not associated with increasing BMI, using either model. However, the risk of fatal events was strongly associated with increasing BMI in both models. Risk of death was significantly higher in men with a BMI 30-39.9 kg/m^2, HR = 1.75 (95% CI: 1.12-2.74) in the minimally adjusted model and HR = 1.60 (95% CI: 1.02-2.53) in the maximally adjusted model.

It appears that obesity is associated with a markedly increased (60% higher) risk of having a fatal CHD event, but not a non-fatal event. We do not yet know why this may be. Possible mechanisms include structural heart changes with obesity, the inflammatory state associated with obesity, or a potentially increased risk of higher concentrations of toxic free fatty acids,[4] all of which could make fatal arrhythmias at the time of myocardial ischaemia far more likely.

It should be emphasised that given the relatively small number of obese men in the WOSCOPS cohort these results need confirmation, and further studies also need to include women, and other ethnic groups.

However, the results can help to promote an important message; obesity is not a benign condition. Obesity is now commonplace and, given the higher prevalence of morbidity, GPs may well see as many obese as non-obese patients every day. While we can treat raised blood pressure and cholesterol, and diabetes effectively, obesity poses a difficult challenge.

Even if time and resources were available, the evidence shows that often only small amounts of weight loss are feasible, and even these are difficult for patients to maintain long term. We still need to confirm that weight reduction actually results in the long-term health benefits that non-intervention, cohort studies such as this one predict.

Urgent work is required to find effective methods of helping patients lose weight that also result in an improvement in health outcomes. In the meantime, it is important to promote a healthy lifestyle and help patients with weight loss as much as possible.

It is worth remembering that, for most, weight maintenance will be a significant improvement on inevitable weight gain.

REFERENCES
1 Benderly M, Boyko V, Goldbourt U. Relation of body mass index to mortality among men with coronary heart disease. *Am J Cardiol* 2010; 106(3):297-304
2 Jousilahti P, Tuomilehto J, Vartiainen E et al. Body weight, cardiovascular risk factors, and coronary mortality. 15-year follow-up of middle-aged men and women in eastern Finland. *Circulation* 1996; 93(7):1372-1379
3 Logue J, Murray HM, Welsh P et al. Obesity is associated with fatal coronary heart disease independently of traditional risk factors and deprivation. *Heart* 2011; 97(7):564-568
4 Oliver MF. Control of free fatty acids during acute myocardial ischaemia. *Heart* 2010;96(23):1883-1884