Reviewer's report

Title: Body weight in midlife and long-term risk of developing heart failure. A 35-year follow-up of the Primary Prevention Study in Gothenburg, Sweden

Version: 3

Date: 25 August 2014

Reviewer: Ineke van Dis

Reviewer's report:

Review of research article ‘Body weight in midlife and long-term risk of developing heart failure. A 35-year follow-up of the Primary Prevention Study in Gothenburg, Sweden’

The association between BMI and heart failure was studied. This question is well addressed by the authors. Referents suggestions and remarks:

BMI

The WHO defines a normal BMI as 18.5 – 25 kg/m2.

Your reference group is defined as a BMI < 22.5 kg/m2. This means that you also included persons with a BMI below 18.5 kg/m2. This category might include persons who have a low BMI because of a (not yet detected) disease and of smoking. Have you dealt with underlying diseases?

Normal BMI is mentioned as BMI 22.5 – 24.99 (page 2, line 36). However, on the same page (line 42 and in line 223) normal BMI is defined as BMI < 25. 24.99 might be changed into 24.9 like in line 117.

You defined five categories of BMI (page 5, line 117): < 22.5 (low), 22.5-24.9 (low normal) …

According the WHO definition, one might call < 22.5 low normal and 22.5-24.9 high normal.

Study population

You used data of 9,998 men who participated in an intervention in the seventies. What was the impact of the intervention on the BMI and on the relation between BMI and heart failure? Men with hypercholesterolemia and hypertension might have been treated for obesity? In line 104 is mentioned 'no significant differences in risk factors'. Is BMI one of the risk factors?

A former smoker who quitted only one month before screening was labelled as a former smoker. This might attenuates the results.

Heart failure

Line 69. The prevalence of HF in Western countries is approximately 2-2.5%. It is more informative to present the prevalence at different age groups, or in the age group of this study. In this study about 25% was discharged from hospital or died
with a diagnosis of HF.

Line 76. If indeed the incidence of HF is decreasing, this is a remarkable finding. Since in Western countries nowadays more AMI patients survive in the acute fase of a life-threatening event, one might expect the incidence of HF to increase.

HF cases are spit into those due to CHD and without CHD. What are the characteristics of those without CHD? E.g. do they already have a higher blood pressure at baseline?

Terminology
Throughout the whole article, both CHD and IHD are used. Please use one terminology. (see e.g. lines 208, 209, 213, title table 2 etc.)

Conclusion: all suggestions concern discretionary and minor essential Revision

**Level of interest:** An article of importance in its field

**Quality of written English:** Acceptable

**Statistical review:** Yes, but I do not feel adequately qualified to assess the statistics.

**Declaration of competing interests:**