

## **Cardiovascular risk factors, BMI and mortality in a cohort of Swiss males (1976-2001) with high-sum-assured life insurance cover**

### **Background**

This long-term study investigates the influence of body-mass index, blood pressure, smoking habits, impaired glucose metabolism and history of any disease on the mortality of Swiss males holding life insurance cover with high sums assured.

### **Methods**

In a prospective study (1976-2001), including 22,927 Swiss insured males holding life insurance cover with high sums assured, the prevalence of overweight and obesity was compared with data from the general population. The relationship between BMI and all-cause mortality was assessed using a Cox proportional hazard model adjusted for age and calendar year, thereby controlling for mortality improvement over time. Multivariable models were used to investigate the impact of multiple cardiovascular risk factors on all-cause and cardiovascular mortality. The evolution of hazard ratios was assessed by dividing the observation period into two periods: (1976-1985 vs 1986-2001).

### **Results**

The prevalence of overweight was 35.7% and of obesity 6.2%. The prevalence of both increased over time. The association between BMI and all-cause mortality showed a 'U'-shaped curve with the nadir at 22.0 – 23.9 kg/m<sup>2</sup>. Compared with this optimal range, a relative risk of 1.80 (CI 95%:1.19 - 2.73) was found for a BMI in the range of 30.0 – 31.9 kg/m<sup>2</sup>, representing the lowest category of obese subjects. In the multivariable model, obese subjects had a hazard ratio of 1.79 (CI 95%:1.37 - 2.35) compared against those with normal BMI. The hazard ratios for all-cause mortality associated with prehypertension, stage 1 and stage 2 hypertension were 1.58, 2.32 and 4.02, respectively, all of them being statistically significant. The results for cardiovascular mortality were more pronounced, however, with wider confidence

intervals. Comparing the two observational periods, the hazard ratios for obese versus non-obese subjects were 1.57 (CI 95%: 1.08 to 2.28) in period 1 and 2.41 (CI 95%:1.71 - 3.39) in period 2. Similarly, the hazard ratio for stage 2 hypertension versus all other categories of JNC7 were 1.48 (CI 95%: 1.12-1.96) and 1.96 (CI 95% 1.48 – 2.57) for periods 1 and 2, respectively.

## **Conclusions**

In this cohort of Swiss insured males holding life insurance cover with high sums assured, prevalence trends of elevated BMI are similar to those in the general population. The relative mortality risks associated with cardiovascular risk factors are higher than in the general population and, in the case of elevated BMI and high blood pressure, exhibit an increase over time.