

Summary (English)

The general aim of this thesis was to examine whether associations, as found in experimental and case-control studies, between body fatness and microvascular function could be observed in population-based samples of apparently healthy subjects. The central underlying hypothesis is that body fatness is related to diabetes and hypertension, at least partly by affecting microvascular function. Although microvascular perfusion is clearly diminished in markedly obese subjects, these case-control studies do not necessarily provide evidence for a linear relationship between body fatness and microvascular function in the general population.

Results

Chapter 2 provides a further introduction to the mechanisms that connect body fatness to microvascular function. Chapter 3 extensively describes the cohort profile of the Amsterdam Growth and Health Longitudinal Study (AGHLS). In chapter 4 up to 7, the relationship of body fatness with microvascular function is examined. In chapter 4, healthy middle-aged adults of the AGHLS study are examined in a cross sectional manner. No relationship between body fatness and microvascular function is revealed. But a significant difference of approximately 5 capillaries per mm² is found between men and women. Chapter 5 and 6 use the longitudinal nature of the AGHLS cohort, describing developmental patterns of body fatness over time. Chapter 5 shows that the use of alcohol, physical activity and smoking are predictors of body fatness trajectories over time. In chapter 6 these body fatness trajectories are examined in relation to microvascular function and large artery properties. Results show a relationship of body fatness with large artery properties, but not with microvascular function. In chapter 7, the New Hoorn Study (NHS) population is used to examine the relationship between body fatness and microvascular function within a slightly older and more metabolically perturbed population. In this population, no relationship was found between body fatness and microvascular function. Nor could a mediating role of microvascular function be found between the relationship of body fatness and insulin resistance or hypertension. Again a higher amount of capillaries is found in women. Finally, in chapter 8, sleep, which also may be involved in the metabolic syndrome, shows to be associated with microvascular dysfunction.

Conclusion

In conclusion, no relationship between body fatness and microvascular function could be detected in normal, apparently healthy subjects: Current results can not conclude a role for body fatness induced microvascular dysfunction in the prevention of cardiovascular disease within the normal apparently healthy population. We did find a higher capillary density in women than in men. This finding needs attention in research using both men and women. Also, sleep is associated with microvascular function. More research is needed to examine the role of sleep and microvascular function in the prevention of cardiovascular disease.