

Obesity, Weight loss and Cardiovascular Risk

Akademisk avhandling

Som för avläggande av medicine doktorsexamen vid Sahlgrenska akademien, Göteborgs universitet kommer att offentligen försvaras i Hjärtats aula, Göteborg, fredagen den 12 juni, klockan 09.00.

av

Shabbar Jamaly

Fakultetsopponent:

Professor Stefan Agewall

Institut för klinisk medicin, Universitet i Oslo, Norge

Avhandlingen baseras på följande delarbeten

- I. Jamaly, S. Carlsson, L. Peltonen, M. Jacobson, P. Sjöström, L. Karason, K. **Bariatric Surgery and the Risk of New-Onset Atrial Fibrillation in Swedish Obese Subjects.** JACC 2016 Dec; 68 (23): 2 4 9 7 – 25 0 4
- II. Jamaly, S. Carlsson, L. Peltonen, M. Jacobson, Karason, K. **Surgical obesity treatment and the risk of heart failure.** European Heart Journal 2019; 40(26): 2131–2138
- III. Jamaly, S. Carlsson, L. Peltonen, M. Andersson Assarsson, J. Karason, K. **Heart failure development in obesity - Underlying risk factors, mechanistic pathways and phenotypes.** *Submitted.*
- IV. Jamaly, S. Redfors, B. Omerovic, E. Carlsson, L. Karason, K. **Prognostic significance of BMI after PCI treatment in ST-elevation myocardial infarction.** Analysis from the Swedish Coronary Angiography and Angioplasty Registry. *Submitted*

Obesity, Weight loss and Cardiovascular Risk

Shabbar Jamaly

Department of Molecular and Clinical Medicine, Institute of Medicine,
Sahlgrenska Academy, University of Gothenburg, Sweden, 2020.

Abstract

Background: The global prevalence of obesity is on the rise, contributing to increased incidence and prevalence of cardiovascular morbidity and mortality. Obesity has adverse effects on cardiac structure and function, directly through a hemodynamic overload, and indirectly through cardiovascular risk factors and low-grade inflammation. Still, epidemiologic studies have found that once cardiovascular disease has developed, people with obesity may experience better prognosis than those with normal weight; a phenomenon termed “the obesity paradox”.

Aims: The objects of the present thesis were: 1) to investigate the effect of surgically induced long-term weight loss on the incidence of atrial fibrillation and heart failure; 2) to study possible mechanisms linking obesity to the development of heart failure; and 3) to examine the prognostic significance of different BMI categories on outcomes in a cohort of patients with ST-elevation myocardial infarction (STEMI) treated with percutaneous coronary intervention (PCI)

Method: We analyzed data from the Swedish Obese Subjects (SOS) study, a prospective matched intervention study comparing bariatric surgery (n=2,010) and conventional obesity treatment (n=2,040). The SOS data was merged with the Swedish National Patient Register (NPR) and with the Cause of Death Register (COD). Data from the SOS obese control group was used to study the link between obesity and heart failure (n=2,040). Data from the Swedish Registry of Catheter-borne Coronary Vessel Surgery (SCAAR) (n=25,384) was merged with the COD Register to study the prognostic significance of different BMI classes.

Results: Surgically induced weight loss resulted in a significantly lower incidence of atrial fibrillation and heart failure during long-term follow-up. Atrial fibrillation and myocardial infarction, as time-dependent variables, were strongly related to incident heart failure. In patients with STEMI treated with PCI, those with BMI > 30 kg/m² had the best outcome in unadjusted analysis, but after adjustment for age and sex individuals with BMI 25-30 kg/m² displayed the best prognosis. Underweight patients with BMI < 18.5 kg/m² had the highest 30-day and 1-year mortality.

Conclusion: In people with severe obesity, bariatric surgery induced a substantial and a sustained weight loss, which resulted in a lower incidence of atrial fibrillation and heart failure. Atrial fibrillation is probably reflected by diastolic dysfunction and myocardial infarction is likely to be related to systolic dysfunction, proposing two different mechanistic pathways for the development of heart failure. Overweight displays the lowest risk for 30-day and 1-year mortality after PCI treatment of STEMI.

Keywords: Obesity, Bariatric Surgery, Atrial Fibrillation Heart failure, Risk factors, , ST-elevation myocardial infarction.

ISBN 978-91-7833-905-1 (PRINT)

ISBN 978-91-7833-904-4 (PDF)

<http://hdl.handle.net/2077/63623>

