

Body mass index and mental health in young people

Predictors of early heart failure and cardiomyopathy

Akademisk avhandling

Som för avläggande av medicine doktorsexamen vid Sahlgrenska akademien, Göteborgs universitet kommer att offentligen försvaras i Lokal Europa, Konferenscentrum Wallenberg, Medicinaregatan 20A, Göteborg, den 6 december, klockan 9.00

av Josefina Robertson

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Avhandlingen baseras på följande delarbeten

- I. Rosengren A, Åberg M, Robertson J, Waern M, Schaufelberger M, Kuhn G, Åberg D, Schiöler L, Torén K. Body weight in adolescence and long-term risk of early heart failure in adulthood among men in Sweden. *European Heart Journal*. 2017;38(24):1926-1933.
- II. Robertson J, Schiöler L, Torén K, Söderberg M, Löve J, Waern M, Rosengren A, Åberg M. Mental disorders and stress resilience in adolescence and long-term risk of early heart failure among Swedish men. *International Journal of Cardiology*. 2017;243:326-331.
- III. Robertson J, Schaufelberger M, Lindgren M, Adiels M, Schiöler L, Torén K, McMurray J, Sattar N, Åberg M, Rosengren A. Higher body mass index in adolescence predicts cardiomyopathy risk in midlife: long-term follow-up among Swedish men. *Circulation*. 2019;140(2):117-125.
- IV. Robertson J, Lindgren M, Schaufelberger M, Adiels M, Björck L, Lundberg CE, Sattar N, Rosengren A, Åberg M. Body mass index in young women and risk of cardiomyopathy: a long-term follow-up study in Sweden. *Submitted*.

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Abstract

Heart failure among young people is rare, but in contrast to decreasing incidence rates overall, recent studies have found increasing rates among the young over the last decades. Concomitantly, cardiomyopathies, which is a common underlying condition to heart failure at a young age, have more than doubled in Sweden for unknown reasons. Two phenomena that coincide with these trends are rising rates of overweight and mental illness in young people. The overall aim of this thesis was therefore to investigate if body mass index (BMI), nonpsychotic mental disorders, and stress resilience (susceptibility to stressful events) at a young age, are associated with early heart failure and cardiomyopathy. We obtained information on BMI and mental disorders from the Swedish Military Service Conscription Register, and the Medical Birth Register. By linking data to the National Patient and Cause of Death registers, which is a unique possibility in Sweden thanks to our personal identification numbers, we identified cases of early heart failure and cardiomyopathy in large population cohorts of 1.7 million men and 1.4 million women during a follow-up of up to 46 years. We found that elevated BMI in young people is associated with an increased risk of early heart failure and cardiomyopathy (**Papers I, III, IV**). The increased risk was detectable already at BMI-levels considered mid- to high-normal for adolescent men (BMI 20–25), whereas, for cardiomyopathy, women of childbearing age had an elevated risk from BMI 25. There was a gradual increase in risk with increasing BMI, regardless of gender, such that severe obesity (BMI ≥ 35) entailed a nine-fold increase in risk for early heart failure and cardiomyopathy among men, and a five-fold higher risk for cardiomyopathy among women. Furthermore, we found that nonpsychotic mental disorders in adolescent males, as well as low stress resilience, are associated with an elevated risk of early heart failure (**Paper II**). Given the current increase in body weight and mental illness among young people, physicians need to be aware of a potential future increase in heart failure and cardiomyopathy cases. The present findings emphasize the already marked importance of weight control in youth, which is essential to curb the obesity epidemic and to prevent the consequences related to it. This should go hand in hand with intensified efforts to prevent mental illness among young people.

Keywords: Heart failure, cardiomyopathy, overweight, obesity, mental disorder, stress resilience, young people, population