

Heart failure epidemiology with emphasis on young adults

Akademisk avhandling

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av

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Avhandlingen baseras på följande delarbeten

I. Basic C, Rosengren A, Lindström S, Schaufelberger M. High validity of cardiomyopathy diagnoses in western Sweden (1989-2009). *ESC Heart Failure* 2018; 5:233-240.

II. Lena Björck, Carmen Basic, Christina Lundberg, Tatiana Zverkova Sandström, Annika Rosengren, Maria Schaufelberger. Survival in Swedish men and women with heart failure from 1987 to 2014. *In manuscript*

III. Basic C, Rosengren A, Alehagen U, Dahlström U, Edner M, Novak M, Zverkova Sandström T, Schaufelberger M. Young patients with heart failure - clinical characteristics and outcomes. Data from the Swedish Heart Failure, National Patient, Population and Cause of Death Registers. *In manuscript*

IV. Basic C, Rosengren A, Dahlström U, Edner M, Zverkova Sandström T, Schaufelberger M. Sex differences among young patients with heart failure in Sweden. *In manuscript*

**SAHLGRENSKA AKADEMIN
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ABSTRACT

Background: Heart failure (HF) is a major health problem worldwide with exponentially increasing incidence with age and the majority of patients being elderly. In recent years, an increase in hospitalization and prevalence of HF in younger persons has been documented in Sweden and Denmark, in contrast to an overall decrease in older patients. In addition, an increase in hospital discharge diagnoses of cardiomyopathy has been reported, also most pronounced among the young. New treatment modalities implemented in every day practice have contributed to improved prognosis in heart failure, but the improvement in mortality has slowed down since the beginning of the 21st century.

Aim: The aim of this thesis was 1) to validate hospital diagnoses of cardiomyopathy; 2) to describe characteristics of young patients with HF; 3) to evaluate possible changes in mortality over time by studying mortality rates, mortality risks and estimation of life-years lost compared with matched controls from the general population; and 4) to explore possible sex related differences among young patients with HF.

Methods and Results: Through search of local hospital discharge registers at three hospitals in western Sweden 611 medical records from 1989 to 2009 with the diagnoses of cardiomyopathy were validated against the latest ESC diagnostic criteria. Of all cases a high proportion, 86%, filled the criteria current at the time of diagnosis. In Paper II, III and IV several Swedish registers were combined. In Paper II all patients with incident hospitalization for HF registered in the National Patient Register were included. Over two periods, 1987-2002 compared with 2003-2014, a decrease in mortality rates were observed mainly among patients <65 years while in patients ≥65 years only minimal improvement in survival was found. As mortality rates decreased more in matched controls from the general population the relative mortality risk increased in patients <65 years during the observed period. In Paper III and IV, all patients from the Swedish Heart Failure Register were included from 2003 to 2014 and patients <55 years were compared with those ≥55 years and matched controls <55 years with regard to patient characteristics, mortality rates and mortality risk. Patients <55 years had higher rates of concomitant cardiomyopathies, myocarditis, obesity, congenital heart disease and reduced ejection fraction (EF) while older patients had more ischemic heart disease, hypertension and atrial fibrillation. Mortality rates were lower among the patients <55 years but when compared to controls they had five times higher mortality risk and patients 18-34 years of age had up to 38 times higher mortality risk. When compared with the estimated life expectancy of the general population the youngest patients lost up to 26 life-years, this declined with increasing age. Women, compared to men, had higher rates of obesity, congenital heart disease, hypertrophic cardiomyopathy, midrange and preserved EF while men had more ischemic heart disease, atrial fibrillation and more often reduced EF. In absolute numbers there was no difference in mortality rates, but women with HF had almost twice as high mortality risk relative to controls than did men (even though not significant) and lost more life-years than men. The most common cause of death was cardiovascular death (CVD) followed by cancer, presence of the latter was associated with doubled mortality risk in men and a 3-fold increase in risk in women, relative to men and women without concomitant cancer.

Conclusion: The validity of the cardiomyopathy diagnoses was high supporting the hypothesis that a real increase of cardiomyopathy might have occurred. Survival of patients with HF improved among patients <65 years while among those older patients the improvement was marginal. The mortality risk relative to age-matched controls increased among the younger group, as the mortality reduction was more pronounced among controls. The younger the patients the higher estimated life-years lost. The most common mode of death was CVD followed by cancer in both sexes. Cancer was associated with increased mortality risk in both sexes.

Key words: cardiomyopathy, validity, heart failure, mortality, epidemiology

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