

Gender differences in heart failure

Vera Regitz-Zagrosek^{1,2}

¹ Charite Universitätsmedizin Berlin, Germany

² DHZB-Deutsches Herzzentrum Berlin, Germany

Gender differences are found in epidemiological and risk factors for heart failure (HF), in its clinical manifestations and underlying pathophysiology and in the response to therapy and are probably relevant for HF prevention and treatment. The prevalence of HF is similar in women and men. It is strikingly high and a disease of old age in both. However, HF with preserved systolic function is more frequent in women. Hypertension and diabetes are the major underlying risk factors in women, whereas myocardial infarction is the major risk factor in men. A link between gender, diabetes and HF is created by the renin-angiotensin system since estrogens down-regulate the activity of this system, which may mean that diabetes and arteriosclerosis progress when this inhibition ceases at the menopause. Differences in gene expression between the failing male and female heart have been found in rodent models and also in humans. Estrogen receptor alpha, expressed in the human heart, changes its expression and localization during the development of HF. Metabolic alterations in myocardial disease may be caused by the interaction of estrogen receptors and PPAR (peroxisome proliferator activated receptors). Estrogens affect the expression of about 2-5% of proteins in the human heart. They are also expressed in arteries and are down-regulated in arteriosclerosis. Various drugs are metabolized differently in women and men and some, affecting heart failure have different gender specific effects/side effects. Examples are ACE-inhibitors, Aspirin and digitalis but probably not angiotensin-receptor blockers. Further investigations are needed to better understand the differences in pharmacotherapy between women and men.