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## Lower Levels of Education Are Associated With Increased Risks of Heart Failure

***Results from a large European study suggest that poorly educated people are more likely to be admitted to hospital with chronic heart failure than the better educated, even after differences in lifestyle have been taken into account. The study is published online on December 9 in the European Heart Journal.***

Researchers followed 18,616 people for as long as 31 years (range 0-31 years, average follow-up was 21 years) between 1976 and 2007 and found that better educated men and women had nearly half the risk of hospital admission for heart failure than the least well educated.

"This is the largest and most comprehensive study so far to examine the relationship between socioeconomic factors and the risk of developing heart failure," said Dr Eva Prescott, Professor of Cardiovascular Prevention and Rehabilitation at Bispebjerg University Hospital (Copenhagen, Denmark), who led the study. "Although it is well known that socioeconomic deprivation is associated with coronary heart disease, much less is known about the link with the development of chronic heart failure. The two diseases share some common risk factors, but it is estimated that less than half of chronic heart failure cases are caused by coronary heart disease. In addition, chronic heart failure is becoming increasingly common."

Heart failure is defined as the inability of one or both sides of the heart to pump enough blood to meet the body's needs, while coronary heart disease is a condition caused by a narrowing of the arteries, which leads to the blood flow to the heart slowing down or stopping.

Doctors carried out physical examinations of all the study participants at the time they joined the study and at regular intervals afterwards to check for diabetes, cholesterol levels, blood pressure, blood glucose levels etc. They also used a questionnaire to assess risk factors that could play a role in the development of heart failure and heart disease, such as smoking, alcohol intake, exercise, or

a family history of diabetes or heart disease, etc. In order to get the most reliable indicator of socioeconomic position, they assessed it by duration of education: less than eight years, 8-10 years, and more than 10 years. In addition, between 2001 and 2003, a random sample of people was assessed using echocardiography, in order to examine the left ventricle of the heart, and systolic and diastolic function.\*

"We used echocardiography as a more reliable way of detecting signs of heart failure, since analyses of hospital admissions may exaggerate the effect of social deprivation because of a possible lower threshold for hospital admission in the relatively deprived," said Prof Prescott.

Prof Prescott and her colleagues found that the most educated men and women had approximately half the risk of heart failure compared with the least educated. After they had adjusted for various cardiovascular risk factors, they found that people who had been educated for more than 10 years had a 39% lower risk of being admitted to hospital for heart failure compared with people who had been educated for less than eight years, and those who had been educated for between 8-10 years had a 25% lower risk. When they looked at the findings from the echocardiography group, the results were similar: people who had been educated for more than 10 years were 39% less likely to have any abnormal echocardiography readings, and those educated for 8-10 years were 28% less likely when compared with the least educated people.

Prof Prescott said: "There are two important findings from this study. The first is that the clear socioeconomic

gradient in risk of developing heart failure found in this and in other studies is not explained by differences in lifestyle. Thus, we must look for other explanations, which potentially include differences in treatment of patients; for instance, perhaps the socioeconomically deprived do not receive the same standard of treatment as the more affluent. We cannot conclude this based on our study but we can see that we must look for explanations other than 'poor behaviour'. The other important finding is that the socioeconomic gradient was seen in echocardiographic indicators of both systolic and diastolic dysfunction. Previous studies have not been able to differentiate between systolic and diastolic heart failure, which have different pathways, but this study points toward a socioeconomic gradient in both subgroups of heart failure.

"In addition, since we were using echocardiography to look at early indicators of heart dysfunction in healthy individuals, we were able to show that the socioeconomic gradient is present from early disease stages, years or decades before development of clinical heart failure. By adding echocardiography to this study we have a more 'objective' measure than hospital admission. Whether or not you are admitted to hospital for treatment not only depends on disease severity but also on the individual threshold for admission; for example, if you have someone

at home to look after you, you may be less likely to be admitted. This could be a source of error in studies such as this. The echocardiography overcomes this problem."

The study does not show what could be the mechanism by which social deprivation is associated with an increased risk of heart failure. "We need more studies on this, but possible explanations could include differences in heart failure treatment as already mentioned, but we must also look for explanations at the pre-clinical stages. One point to be mentioned is the role of psychosocial stress on development of heart failure -- this has received very little scientific attention so far."

Prof Prescott concluded: "This study shows that deprivation, as measured by levels of education, should be regarded as a risk factor for chronic heart failure in line with what is already known for coronary heart disease, and policy makers should be aware of this when planning social and healthcare provision."

\*Systolic pressure is the maximum pressure in the artery at the moment the heart is beating and pumping blood around the body. Diastolic pressure is the lowest pressure in the artery in the moments between beats when, the heart is resting.

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