Is impaired exercise capacity associated with higher risk of mortality in adults with congenital heart disease?

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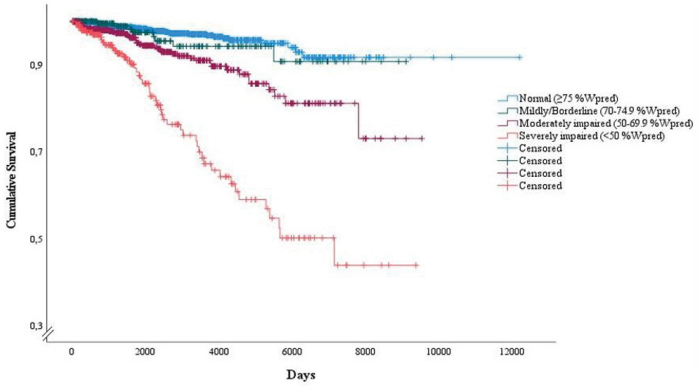
Funding Acknowledgement: Type of funding sources: Other. Main funding source(s): The Swedish Heart-Lung Foundation

Background: Impaired exercise capacity is a common finding among adults with congenital heart disease (CHD) and it has previously been reported that impaired exercise capacity is associated with higher risk of mortality, hospitalisation and/or transplantation. However, previous reports have been single centre with small sample sizes and composite endpoints.
Purpose: The aim of present report was to analyse the association between mortality, as primary endpoint, and aerobic exercise capacity in adults with CHD.
Methods: Data on exercise capacity from all registered test assessed with bicycle ergometer were retrieved from the Swedish Registry of Congenital Heart Disease. Percent of predicted peak workload (%Wpred) was calculated according to sex, age and height and compared to a national reference material (n=1790, 58% men).
Results: 2748 adults with CHD were included (41% women). Median age was 31.7 years (range 18–80.6 years) and mean %Wpred was 77±21.0%. At a median follow-up time of 5.3 years (range 0.02–36.5 years) 135 patients were deceased (4.9%). Moderately impaired exercise capacity (50–70% Wpred) (HR 3.0, p<0.001), severely impaired exercise capacity (<50% Wpred) (HR 9.7, p<0.001), NYHA class II (HR 4.4, p<0.001) and NYHA class III–IV (HR 12.6, p<0.001) was associated with increased risk of mortality in univariable cox regression. In multi-variable Cox regression exercise capacity <50% Wpred (HR 3.0, 95% CI [1.5–5.8], p<0.001), NYHA class II (HR 2.8, 95% CI [1.6–5-1], <0.001) and NYHA class III–IV (HR 8.0, 95% CI [4.2–15.1] p<0.001) was associated with higher mortality risk adjusted for sex and diagnosis.
Conclusions: Our findings show that exercise capacity <50% and NYHA class ≥II are both associated with increased risk of mortality, regardless of diagnosis.



Kaplan Meier curves illustrating survival among adults with congenital heart diseases classified into four groups according to percent of predicted peak work load using; Log rank<0.001. %Wpred, percent of predicted peak workload; d, days.

Figure 1. Kaplan-Meier curve for mortality as endpoint