

NYHA classification in adults with congenital heart disease: Relation to objective measures of exercise and outcomes

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Introduction

We aimed to validate NYHA functional classification and its relation to objective limitation based on cardiopulmonary exercise testing (CPET) in adult with congenital heart disease (ACHD) and to long-term outcome.

Methods

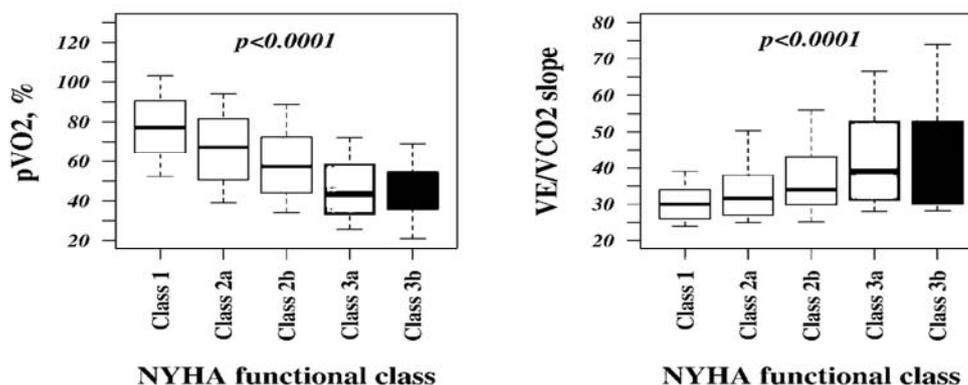
This is a retrospective study included all ACHD patients who underwent a CPET between 2005 and 2015 at the Royal Brompton. Effort-related dyspnoea was graded according to NYHA classification and divided in subgroups (2A, 2B, 3A and 3B). All diagnoses were graded according to the Bethesda Classification. Patients' outcomes, including hospitalization and all-cause mortality were completed.

Results

2781 patients (mean age 33.8 ± 14.2 years at CPET) representing the full range ACHD were included. There was a strong correlation between NYHA functional class, peak $\dot{V}O_2$ and $\dot{V}E/\dot{V}CO_2$ slope ($p < 0.0001$). NYHA was also correlated with ACHD severity according to the Bethesda classification ($p < 0.0001$). Although a large number of NYHA class 1 patients did not achieve a "normal" CPET, NYHA classification was nevertheless a strong predictor of mortality with an 8.7-fold increased mortality risk in class 3 compared to class 1 (HR 8.68, 95CI: 5.26-14.35, $p < 0.0001$). Furthermore, dividing ACHD patients in class 2 subgroups appeared to carry additional prognostic information, but not so for class 3 subgroups.

Conclusion

Despite known limitations, NYHA classification relates to objective measures of exercise and predict long term outcome in ACHD. Our data suggests potential merits from subdividing NYHA functional classification 2 into subgroups A and B, but this needs validation in further studies. NYHA classification should be routinely recorded in the periodic assessment of ACHD.



Peak $\dot{V}O_2$ and $\dot{V}E/\dot{V}CO_2$ according to detail NYHA functional class