Low pulmonary artery pulsatility index is associated with adverse outcomes in patients with advanced heart failure

Authors:
S Cesini¹, S Bhagra¹, S Pettit¹, ¹Papworth Hospital NHS Trust - Cambridge - United Kingdom of Great Britain & Northern Ireland,

Topic(s):
Hemodynamics of Heart Failure

Citation:
Background. Pulmonary artery pulsatility index (PAPi) is a novel haemodynamic measure of right ventricular function. PAPi is defined as systolic pulmonary artery (PA) pressure minus diastolic PA pressure, divided by right atrial pressure. Low PAPi has been shown to be associated with an increased risk of right ventricular failure after left ventricular assist device (LVAD) implantation and was also associated with an increased risk of mortality in the ESCAPE trial.

Purpose. To determine whether PAPi is associated with adverse outcomes in ambulatory outpatients with advanced heart failure.

Methods. All outpatients who were assessed for heart transplantation at a single centre between January 2010 and January 2019 were included. Each patient underwent right heart catheterisation and PAPi was calculated. Death, urgent heart transplantation and requirement for mechanical circulatory support (MCS) were the co-primary endpoints. Patients were followed up until the first primary endpoint or 1st January 2019. Kaplan-Meier analyses were performed on patients grouped into PAPi quartiles.

Results. A total of 668 patients were included. The median PAPi for the entire study population was 2.18 (interquartile range 1.41-3.60). In total, 272 (41%) patients reached a primary endpoint after a median of 1.49 years follow-up. PAPi was significantly lower in patients who reached a primary endpoint, compared with patients who did not reach a primary endpoint (2.06 vs 2.25, p=0.01552). There was a significant difference in survival free from urgent heart transplantation or mechanical circulatory support when patients were grouped in quartiles (Figure, p=0.0422). Patients with a PAPi of less than 1.4 had the greatest likelihood of death or the need for urgent heart transplantation or mechanical circulatory support.

Conclusions. Low pulmonary artery pulsatility index (PAPi) is associated with adverse outcomes in ambulatory outpatients with advanced heart failure. Clinicians who are undertaking right heart catheterisation for assessment of advanced heart failure should consider calculation of this haemodynamic measure.
Abstract: Low pulmonary artery pulsatility index is associated with adverse outcomes in patients with advanced heart failure.

Purpose: To determine whether PAPi is associated with adverse outcomes in ambulatory outpatients with advanced heart failure.

Methods: All outpatients who were assessed for heart transplantation at a single centre between January 2010 and January 2019 were included. Each patient underwent right heart catheterisation and PAPi was calculated. Death, urgent heart transplantation and requirement for mechanical circulatory support (MCS) were the co-primary endpoints. Patients were followed up until the first primary endpoint or 1st January 2019. Kaplan-Meier analyses were performed on patients grouped into PAPi quartiles.

Results: A total of 668 patients were included. The median PAPi for the entire study population was 2.18 (interquartile range 1.41-3.60). In total, 272 (41%) patients reached a primary endpoint after a median of 1.49 years follow-up. PAPi was significantly lower in patients who reached a primary endpoint, compared with patients who did not reach a primary endpoint (2.06 vs 2.25, p=0.01552). There was a significant difference in survival free from urgent heart transplantation or mechanical circulatory support when patients were grouped in quartiles (Figure, p=0.0422). Patients with a PAPi of less than 1.4 had the greatest likelihood of death or the need for urgent heart transplantation or mechanical circulatory support.

Conclusions: Low pulmonary artery pulsatility index (PAPi) is associated with adverse outcomes in ambulatory outpatients with advanced heart failure. Clinicians who are undertaking right heart catheterisation for assessment of advanced heart failure should consider calculation of this haemodynamic measure.