Signs of dysfunction in the right ventricle among young adults born with bronchopulmonary dysplasia (BPD) and asthmatics: data from the LUNAPRE cohort

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Background/Aim: Bronchopulmonary dysplasia (BPD) is diagnosed in preterm born infants treated with oxygen supplementation. BPD may lead to long-lasting multifactorial inflammatory response associated with cardiopulmonary events, such as pulmonary hypertension. We aimed to characterize echocardiographic findings in young adults with BPD compared with preterm, term-born controls and individuals with mild asthma.

Methods

A total of 93 participants (median age 19.8 years) from the LUNg Adult PREmaturity (LUNAPRE) cohort (NCT02923648) were included. Transthoracic echocardiography with Doppler recordings, Tissue Doppler and Speckle Tracking Imaging was performed using Vivid E95 ultrasound system. Statistical analysis was performed using Kluskal-Wallis test, corrected for multiple testing.

Results

Pulmonary arterial pressure and TAPSE were of a similar magnitude in the four studied groups. The right ventricular myocardial performance index (RV-MPI) was within normal limits, but clearly higher in individuals with previous BPD (0.340, IQR: 0.287-0.395) and in individuals with asthma (0.325, IQR:0.293 -0.380) compared with both healthy controls (0.230, IQR: 0.200-0.293) and preterm individuals without BPD (0.230, IQR: 0.220-0.280), p.adj = 0.003. RV-MPI correlated with chest radiology score in a positive manner in BPD and preterm groups (rs =0.46, p=0.004) and with total days on oxygen (rs =0.53, p=0.002).

Conclusions

Young adults born with BPD and mild asthmatics exhibit echocardiographic signs suggestive of early dysfunction in the right ventricle without overt pulmonary hypertension. These findings highlight the need for longitudinal studies to determine the clinical relevance of early cardiac alterations and to identify potentially treatable traits in adults with BPD.