Reviewer’s report

Title: Reliability of three-dimensional color flow Doppler and two-dimensional pulse wave Doppler transthoracic echocardiography for estimating cardiac output after cardiac surgery

Version: 0 Date: 27 Dec 2018

Reviewer: Vadim Kuznetsov

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The study is very interesting, methodologically original.

Application of three-dimensional color flow Doppler is especially important after valve replacement surgery while two-dimensional pulse wave Doppler has a limitation - this technique is angle-dependent and involves the assumption of a uniform flow profile within the left ventricular outflow tract (LVOT) and the measurement of the diameter of the LVOT and the assumption of its cross-sectional morphology further reduce the accuracy of the measurement.

The design of the study is a little bit misleading: a comparison of two echocardiographic methods with minimally invasive monitoring of pulse arterial pressure, but this method was validated related to invasive measurement of stroke volume.

The data were collected during various cardiac surgery (mitral/tricuspid valve replacement, coronary artery bypass graft, cardiac tumor resection, repair of atrial septal defect). Aortic valve morphology is assumed to be different for various reasons for surgery. The number of patients in the study is quite small (20 patients). If the authors plan to continue the work on this study may be it makes sense to conduct research on one type of surgery for more objective assessment of two-dimensional pulse wave Doppler?

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