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Effect of Contrast-Enhanced Echocardiograms on the Prognosis of Infective Endocarditis

D. Arias, E. Halpern, F. Forsberg, J.R. Eisenbrey

Abstract (≤ 300 words)

Objective

Infective endocarditis (IE) is an infectious disease of the cardiac valves where bacteria colonize the valves; typically, via the formation of vegetations. Recent research has shown that the microbubbles in a contrast-enhanced ultrasound (CEUS) examination can move and dislodge bacterial vegetations *in vitro*. This study investigated whether CEUS resulted in faster resolution of IE *in vivo* by dislodging the vegetations.

Methods

This IRB approved retrospective study reviewed 36 patients who were diagnosed with IE via echocardiography. Data was sourced from patients within the Jefferson University Hospital's Cardiology EMR system by searching for contrast and vegetation from January 1st, 2013 – January 1st, 2018. Fifteen patients were not given contrast, whereas 21 patients were given contrast via agitated saline (n=16) or an ultrasound contrast agent (n=5). All patients received an echocardiogram after blood cultures confirmed an infection, but before resolution of infection (defined by negative blood cultures). A student's t-test was used for analyses.

Results

The study population was heterogeneous in terms of sex (67.5% male) and race (70% Caucasian, 25% African American, and 5% Asian), with an average age of 51 ± 20 years, and an average BMI of 29.65 ± 7.43 in the contrast group and 27.67 ± 3.16 in the non-contrast group ($p=0.37$). Following ultrasound, no patients had documented stroke, pulmonary embolism, or systemic blood clot, which physicians could have attributed to a thrombus resulting from dislodging of bacterial vegetation. Overall, blood cultures did not clear faster in patients receiving CEUS compared to those undergoing standard echocardiography, (2.63 ± 2.69 days vs. 1.34 ± 1.11 days, $p=0.09$). CEUS also did not shorten the admission length in patients with IE, (16.9 ± 7.7 days vs. 19.9 ± 12.1 days; $p=0.36$).

Conclusion

Based on this limited sample size, patients who underwent CEUS did not have a different prognosis when compared to patients who received a non-contrast echocardiogram.