IMPACT OF CONTRAST ECHOCARDIOGRAPHY ON OBESE ICU PATIENT OUTCOMES AND HEALTHCARE RESOURCE UTILIZATION

Poster Contributions
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Background: Image quality of suboptimal transthoracic echocardiograms can be enhanced by the use of intravenous contrast (cTTE). Although image quality is often suboptimal in obese patients, no large-scale studies have evaluated the effect of cTTE on resource utilization in these patients. This study compared the impact of cTTE vs. non-contrast (nTTE) on number and cost of subsequent cardiac function tests, subsequent total hospitalization cost, post-TTE total and ICU length of stay (LOS), and mortality among obese ICU patients.

Methods: De-identified data were extracted from the Premier hospital database for all ICU patients receiving either cTTE with perflutren lipid microspheres or nTTE between 1 Jan 2002 and 31 Dec 2009. Obese patients were identified using ICD-9-CM codes. Patients were matched using propensity score matching yielding two groups of 18,748 each (obesity subsample: cTTE=3,617; nTTE=3,617). The final model was evaluated using goodness of fit statistics and adjusted for high or low frequency use of cTTE. LOS and cost were analyzed using multivariate gamma regression with an adjustment for annual healthcare inflation. Number of cardiac function tests was analyzed using Poisson regression. Mortality was analyzed using multivariate logistic regression.

Results: In comparison with ICU obese patients who underwent nTTE, ICU obese patients who underwent cTTE had a significantly lower number of cardiac function tests post-TTE (~1 test, CI=0.86-0.95; p=0.0001), shorter LOS (~7.5%, CI=4.2-10.8; p=0.0114), and lower hospitalization cost (~11.1%, CI=4.8-17.3; p=0.0005). Although not significant, a trend was found for shorter ICU LOS post-TTE (~9.1%, CI=4.7-13.4; p=0.0641), lower cost of cardiac function tests post-TTE (~1.6%, CI=8.1-11.4; p=0.7416), and decreased risk of death (OR=0.879, CI=0.735-1.454; p=0.1427) in obese cTTE patients.

Conclusions: The use of contrast TTE in obese ICU patients is associated with significantly fewer subsequent cardiac function tests, lower post-TTE LOS, and lower post-TTE hospitalization cost, and fewer subsequent cardiac function tests, thus cTTE should be considered in this patient population.