



Congenital Cardiology Solutions

DIAGNOSTIC ERRORS IN OUTPATIENT ECHOCARDIOGRAPHY IN INFANTS AND YOUNG CHILDREN: THE IMPACT OF PROCEDURAL SEDATION

Poster Contributions

Poster Sessions, Expo North

Saturday, March 09, 2013, 3:45 p.m.-4:30 p.m.

Session Title: Congenital Cardiology Solutions: Congenital Imaging

Abstract Category: 13. Congenital Cardiology Solutions: Pediatric

Presentation Number: 1160-119

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Background: Echocardiography is commonly performed in infants and children for evaluation of heart disease. These patients often cannot lie still during an echocardiogram (echo), which may result in incomplete examinations, suboptimal image quality, and diagnostic errors. These errors may possibly be prevented if procedural sedation is used to improve study conditions. We sought to examine study quality measures and diagnostic error in children ≤ 36 months and determine the impact of procedural sedation on these outcomes.

Methods: Echos from 2008-2009 on outpatients ≤ 36 months were reviewed. We collected demographic, image quality concern and study completeness data. Diagnostic errors were identified and categorized by review of the echo images and medical record. Errors were categorized as not preventable (incorrect modality), possibly preventable (preventable with improved technique/conditions) or preventable (image interpretation error).

Results: Among 1515 echos (428 sedated) 15% were incomplete and 49% had image quality concerns. The diagnostic error rate was 7.1%; 11% of errors were not preventable, 63% possibly preventable and 26% preventable. The majority of errors (64%) were in patients with medium/high anatomic complexity. Patients with greater anatomic complexity were more likely to have a sedated echo. Sedated echos had fewer quality concerns (22% vs. 59%) and were less often incomplete (2% vs. 20%), $p < 0.001$. Diagnostic errors in unsedated echos were more often categorized as possibly preventable/related to study technique (76% vs. 44%, $p < 0.001$). In multivariate analysis, errors were increased in medium complexity disease (adjusted odds ratio (AOR) 2.85, $p < 0.001$), high complexity disease (AOR 4.21, $p < 0.001$) and pre-intervention echos (AOR 3.37, $p < 0.001$). Examining possibly preventable errors separately, the use of sedation trended towards an association with lower odds for error (AOR 0.58, $p = 0.07$).

Conclusion: Quality concerns and incomplete studies are frequent in outpatient echocardiograms in children ≤ 36 months. Procedural sedation improves these measures and is associated with a trend towards a decreased rate of possibly preventable diagnostic errors.