

16:00 – RT012

META-ANALYSIS METHODS USED IN RADIOLOGY JOURNALS

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OBJECTIVE: Evaluate whether systematic reviews of diagnostic accuracy studies in radiology journals are using recommended methods for meta-analysis, and to evaluate the impact of traditional versus bivariate methods.

METHODS: Medline was searched for meta-analyses of test accuracy, without language restrictions, limited to radiology journals (Jan 2005 to May 2015). Two reviewers extracted study data and classified methods as non-appropriate (traditional **METHODS** univariate fixed or random effects pooling; SROC) or appropriate (recommended **METHODS** bivariate model; HSROC). Methodology utilization was analyzed for variation over time, by geographical location, subspecialty and journal. A subset of reviews using traditional univariate pooling methods were recalculated with a bivariate model.

RESULTS: 300 reviews met the inclusion criteria, of which 118 (39%) used appropriate methods. No change in methods used was observed over time ($r=0.54$, $p=0.09$). Uptake showed geographic ($p=0.001$), subspecialty ($p<0.001$) and journal ($p<0.001$) heterogeneity. Average change in summary estimate was -1.4% ($p<0.0038$) for sensitivity and -2.5% ($p<0.001$) for specificity. Average change in width of confidence intervals was 7.7% ($p<0.001$) for sensitivity and 9.9% ($p<0.001$) for specificity. Average change in lower limit of confidence intervals was -6.5% ($p=0.013$) for sensitivity, and -8.9% ($p=0.0012$) for specificity.

CONCLUSION: Utilization of recommended methods for diagnostic accuracy meta-analysis in radiology journals has not changed over time. Significant differences in summary estimates, confidence interval ranges and lower limits were observed between traditional and recommended methods. Using inappropriate techniques for data pooling may lead to inaccurate estimates of diagnostic test accuracy which, if applied in clinical practice, might have a negative impact on patient care

16:10 – RT013

EXPIRATORY PHASE CT PULMONARY ANGIOGRAPHY: IMPROVING CONTRAST ENHANCEMENT OF THE PULMONARY ARTERIES IN FAILED DIAGNOSTIC STUDIES

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OBJECTIVE: Non-diagnostic CT pulmonary angiography (CTPA) studies are routinely repeated in end-inspiration. This study assessed the benefit of repeating studies in end-expiration.

METHODS: Failed CTPAs repeated in end-inspiration with increased iodine load were identified during August 2011 to December 2011 using PACS (retrospective cohort). From November 2013 to December 2015, non-diagnostic CTPAs were repeated in end-expiration with the same injection protocol (prospective cohort). Lung volumes and pulmonary arterial attenuation were compared in non-diagnostic inspiration and repeated studies (*t* test). Main Pulmonary Artery and/or Average Pulmonary Arteries attenuation >200HU was considered a diagnostic CTPA.

RESULTS: In the retrospective cohort, 36 of 1063 CTPAs were non-diagnostic and repeated in inspiration, and showed increased pulmonary arterial attenuation for all arterial segments ($p < 0.001$) and no change in lung volumes ($p > 0.05$). In the prospective cohort, 36 of 5348 consecutive CTPAs were non-diagnostic and repeated in expiration, showing higher attenuation in all arterial segments ($p < 0.001$), with an average 30% decrease in lung volumes [-24% to -36%, 95% CI]. Repeated studies were diagnostic in 86% (31/36) of the retrospective (inspiratory) group and prospective (expiratory) group. The average increase in attenuation was 62% [+38% to +87%, 95%CI] and 83% [+59% to +107%, 95%CI] in the retrospective and prospective groups respectively ($p = 0.11$).

CONCLUSION: End-expiration CTPA studies showed significant improvement in pulmonary arterial enhancement compared to failed inspiration studies. The salvage study performed in end-expiration was diagnostic in 86% (31/36) of patients, and non-inferior to increasing contrast flow rate and total contrast volume.