Article Appraisal

Article: No added value of the age-adjusted D-dimer cut-off to the YEARS algorithm in patients with suspected pulmonary embolism

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Background and Study Objective(s):

The diagnosis of a pulmonary embolism is difficult but can be aided with clinical prediction rules. One such rule is the YEARS algorithm. This study set to seek improvements to the current YEARS algorithm by implementing an age adjusted D-Dimer (ADJUST) to the algorithm.

Study Design:

This study was a post-hoc analysis of the original 3465 patients used to derive the YEAR rule. The patient population was recruited as consecutive in and out patients clinically suspected of PE across 12 hospitals in the Netherlands between 2013 and 2015. The outcomes measured was the efficiency of the rule (number of patients managed without CTPA scans) and diagnostic failures (Missed PE at 3 month follow up). Four different hypothetical scenarios were tested in this study to compare the outcomes:
1. YEARS algorithm
2. Age adjusted D-dimer threshold for patients aged >50 years and one of more YEARS items. All other patients managed according to YEARS
3. Age adjusted D-dimer threshold for patients aged >50 years. All other patients younger than 50 years managed according to YEARS
4. All patients managed conventionally (Using Wells, ADJUST, etc)

Results:

In the 4 hypothetical scenarios analysed, only scenario 2 was associated with a projected significant decreased in the number of CT PE scans (absolute difference of 4.7%) compared to the original YEARS algorithm. However this was at the cost of 4 missed PE diagnoses at baseline which the authors concluded as an unacceptably high failure rate. The other scenarios failed to show any further significant differences in the number of patients managed without CTPA and the failure rates across the different scenarios.

Validity of Results:

This study was a multi-center study done in a single country in Europe. The prevalence rates of PE and demographics are likely to be different than our population. Additionally, as a post-hoc analysis, there was no randomization of the four scenarios. Given these limitations the authors consider this study to be only hypothesis generating.

Generalizability of Results:

This study shows that the original YEARS study is effective in helping with the diagnostic workup of a PE without an added benefit to combining YEARS with ADJUST. Thus, the author hypothesize that YEARS alone was had the most beneficial safety and efficient profile useful in a clinical setting.

The Bottom Line:

This study set out to simplify the diagnostic work-up of a PE and to reduce the number of CT scans by trying to optimize the YEARS algorithm with the addition of ADJUST rule. However, the study failed to show a value add of implementing ADJUST in the YEARS algorithm.