AGE-ADJUSTED VERSUS CUT-OFF FOR D-DIMER TO EXCLUDE PULMONARY EMBOLISM AUDIT

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Background

- D-dimer is a fibrin degradation product used as a diagnostic test.
- D-dimer is nonspecific and assays are not standardised, limiting diagnostic safety and utility.[1]
- Age-adjusted D-dimer (AAD) has greater specificity and can reduce the number of false-positive results.[2]
- NICE guidance recommends considering AAD for exclusion of Pulmonary Embolism (PE) in patients aged over 50-years only.[3]
- Our trust guidelines treat a D-dimer > 500 µg/L as positive even in low probability.

Aims

- To evaluate the validity of age-adjusted D-dimer
- To change the cut-off from 500 µg/L AAD in patients who are aged 50 or above.
- Improve documentation of pre-test probability in clinical notes.
- Encourage the radiology department to report the presence or absence of right ventricular heart strain on reports.

Methods

- A retrospective review of computed tomography pulmonary angiogram (CTPA) scans for patients aged 50 or more with suspected PE (n=400).
- 3 stages for complete audit cycle: Stage 1 occurred between May and September 2021. Stage 2 in October 2021 and stage 3 in November 2021.
- Inclusion and exclusion criteria are summarised in table 1.

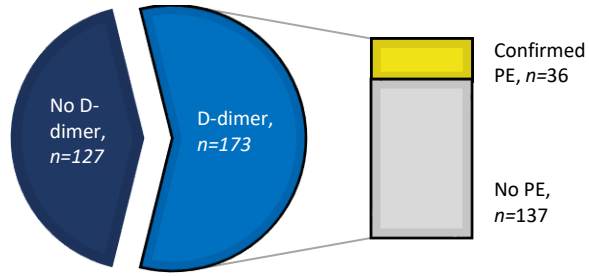
Table 1: A table showing the inclusion and exclusion criteria for the study

Inclusion criteria	Exclusion criteria
Patients with a suspected PE	Patient with known DVT
Age ≥50 years-old	Age < 50
Low clinical probability for PE	Pregnant women
	Patients on anticoagulation at time of test
	Sars-CoV-2 positive patients

Results

- 300 out of 400 scans matched the inclusion criteria for the study in the first stage.
- Participant ages ranged from 50 to 98 years with 173 female to 127 male patients included.
- Pre-test probability (Wells score) was documented in 16.6% (n=50) of patients.
- D-dimer level was checked in the majority of patients as illustrated in figure 1.

Figure 1: A mixed graph showing the proportion of confirmed PE vs negative scans for patients with a D-dimer



- All patients with a confirmed PE should have had the scan according to their AAD value (100%).
- Following interventions (second stage), 100 CTPA scans were re-audited (third stage) and 23% (n=23) were positive for PE.
- Of these positive scans, 13% (n=3) would not have been suitable for imaging if only the AAD was considered.
- Overall, 93.6% with a raised D-dimer, but below the age-adjusted limit, did not show evidence of PE on imaging.
- 94.9% of positive PE imaging had a raised D-dimer above the age-adjusted level.

Conclusions

- AAD has validity in low-risk patients aged 50 years or older.
- AAD relies on low pre-test probability which was infrequently documented.
- AAD theory would have prevented unnecessary risks for patients.
- Our acute physicians do apply AAD in low-risk patients.

Next steps

- Annually re-auditing Wells score documentation.
- Annually re-auditing CTPA reports for mention of presence or absence of right heart strain.

References

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