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Comparison of Xenon and a Modified Nebulizer for Aerosol Ventilation in the Diagnosis of Pulmonary Embolus: Impact on the Intermediate Pioped Category

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Using the Pioped criteria for evaluation of suspected pulmonary embolism, 39% of patients in the initial study (J.A.M.A.) were assigned in intermediate category. The initial study utilized Xenon 133 for ventilation. A subsequent study (J Nucl Med 1995) using modified Pioped criteria and aerosol ventilation demonstrated a 17.4% assignment for the intermediate category. The purpose of the current study was to evaluate the intermediate category assignment in patients who underwent pre-perfusion Xenon or pre-perfusion aerosol imaging using the modified Pioped criteria.

Methods: 643 patients were evaluated using a modified nebulizer system requiring 2 minutes of tidal volume breathing followed by an 8-view lung study matching the perfusion study. The Xenon study was performed on 216 patients in the posterior position using 30 mCi Xenon 133 with initial breath holding, re-breathe and washout views. Perfusion was performed using 4 mCi of Tc-99m MAA.

Results: The intermediate assignment for the Xenon study group was 35.6% (77/216) while the aerosol study resulted in 22.1% (142/643) for the intermediate category. The difference was significant (P=.00008).

Conclusion: Using a new modified nebulizer with only 2 minutes of patient breathing, excellent results were obtained yielding an intermediate category of 22% which is in the accepted published peer review range.

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