**ACCURACY OF STRUCTURED PHYSICAL EXAM AND ULTRASOUND IN EMERGENCY DEPARTMENT PATIENTS WITH DYSPNEA**

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**BACKGROUND:** Debate exists around the relative diagnostic accuracy of the structured comprehensive physical exam (PE) versus bedside thoracic ultrasound (US) in patients with dyspnea. We compared the accuracy of PE and US in ED patients with dyspnea.

**METHODS:**We enrolled hemodynamically stable adults who presented with dyspnea to a large academic ED. In a randomized fashion, ED physicians performed either the structured PE (inspection, palpation, percussion, auscultation) followed by thoracic US (presence of A/B lines, lung sliding, effusion, and consolidation in 6 lung fields bilaterally) or US followed by PE on each patient. After each evaluation, the physician rated his/her degree of certainty (low, moderate, or high) that any of 6 diagnoses (pulmonary edema, COPD, pneumonia, pleural effusion, asthma, and pneumothorax) were present. A masked adjudicator determined each patient’s final diagnosis based on his/her hospital course and all available clinical data. For each patient, we compared the accuracies ((true positive + true negative)/all) of PE and US using the adjudicated diagnosis as the criterion standard.

**RESULTS:**We enrolled 102 patients. Mean age was 63. 56% were male. Patients were randomized to PE first (n=50) or US first (n=52). 33 patients had more than 1 diagnosis. Final diagnoses included pulmonary edema (n=32), COPD (n=29), pneumonia (n=20), pleural effusion (n=8), and asthma (n=6). 49 patients had none of these conditions. The accuracies of PE and US were: pulmonary edema (73 vs. 76 [p=0.74]), COPD (75 vs. 76 [p=0.74]), pneumonia (72 vs. 81 [p=0.1]), pleural effusion (96 vs. 82 [p=0.003]), and asthma (87 vs. 87 [p=1]). Diagnostic accuracies did not differ based on order of evaluation.

**CONCLUSIONS:**For mostof the conditions studied, PE and US were similarly accurate in diagnosing ED patients with dyspnea. The one exception to this (albeit with a small sample size) was pleural effusion, for which PE was more accurate. Future studies would benefit from even larger sample sizes to include more patients in each diagnosis group.

**SAMPLE SIZE:** We assumed that the structured PE is 65% accurate in diagnosing the cause of dyspnea in ED patients. In order to achieve an 80% power to detect an absolute increase in the diagnostic accuracy of US with a significance level <0.05, we determined that each group must contain 43 patients. Assuming a dropout rate of 10%, 102 patients were recruited.

**CONTENT CATEGORY**: Clinical research

**KEYWORDS:** *ultrasound, shortness of breath, physical exam, emergency department, diagnostic tool*