Journal Reading

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#1

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Brief Report

Assessment of emergency physician–performed ultrasound in evaluating nonspecific abdominal pain

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Introduction

- Emergency physician (EP)–performed ultrasound (EPUS) can improve the care of emergency department (ED) patients.
- Nonspecific abdominal pain (NSAP) has not been studied.
- NSAP was defined as abdominal pain for which the patient did not have a presumed diagnosis or referral for specific evaluation.

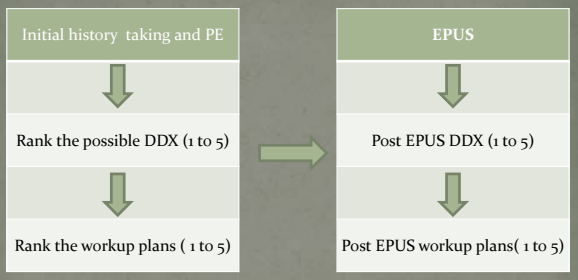
Study design

- Prospective
- Non-interventional
- Observational
- Institutional review board–approved study using a sample of consecutive patients presenting with NSAP between June 1, 2006, and June 1, 2007.
- This study was conducted at 2 urban, academic EDs with a combined annual adult census of 82000 visits.

Selection of participants

- Exclusion criteria:
  - for specific evaluations
  - pregnancy test (+)
  - unable to speak English
- Of 36 EPs who met the American College of Emergency Physicians (ACEP) training guidelines, 20 (55%) consented to participate.

Protocol



* EPUS was performed in a goal-directed fashion.

- EPUS were not primarily responsible for the patients.
- Treating clinicians were blinded to the results of EPUS except the patient would have been placed at risk by such blinding.

Criterion standard

- Two EPs reviewed the all hospital data except the result of EPUS to determine the final diagnosis.
- third physician for "tie-breaking" review if needed.
- Telephone contact in 30 days later to determine if any other diagnoses were made.

Study measurements

- The first outcome measure was the impact on DDX.
- The second outcome measure was projected impact on diagnostic workup.

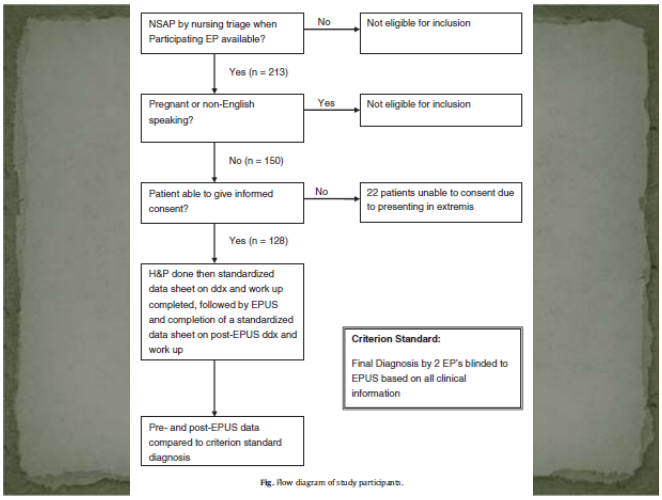


Fig. Flow diagram of study participants.

Results

Table 2
Diagnoses of patients

Diagnosis	n
Abdominal pain NOS	20
Acute renal failure	1
Aortic aneurysm	2
Aortic dissection	1
Appendicitis	3
Ascites, new onset—r/o SBP	3
Bladder mass	1
Cholecystitis	18
Cholelithiasis	17
Colitis	2
Diverticulitis	2
Gallstone pancreatitis	4
GERD	10
Hepatic mass	2
Hydronephrosis	5
Impacted gallstone	2
Metastatic cancer, unknown primary	1
Ovarian cyst or mass	7
Pancreatitis	4
Perforated bowel	1
Pyelonephritis	1
Small bowel obstruction	11
Ureterolithiasis	14

Abbreviations: NOS, not otherwise specified; r/o SBP, rule out spontaneous bacterial peritonitis.
n > 128 because 2 patient had both cholelithiasis and ureterolithiasis, 1 patient had both metastatic cancer with an unknown primary and AAA, and 1 patient had diverticulitis and a AAA.

- 45% patients had an improvement in their DDX and planned diagnostic workup by using EPUS.
- Post-EPUS, 50% patients would have been treated without further radiographic imaging.
- Post-EPUS, 39% patients would have been treated without any further laboratory testing or imaging.

Table 3
Diagnoses of patients for whom no further radiographic imaging would have been pursued post-EPUS

Diagnosis	n
Abdominal pain NOS	9
Ascites, new onset—r/o SBP	2
Cholecystitis	14
Cholelithiasis	17
Colitis	1
Gallstone pancreatitis	4
GERD	8
Hepatic mass	1
Impacted gallstone	2
Pancreatitis	2
Pyelonephritis	1
Ureterolithiasis	4

n > 64 because 1 patient had both cholelithiasis and ureterolithiasis.

Discussion

- Decreased radiation exposure and time and cost savings.
- The number needed to treat (NNT) would be 3 to improve diagnosis and eliminate further diagnostic workup.
- The risk/ benefit ratio would favor routine incorporation of EPUS into the evaluation of ED patients with NSAP.

Factors should be concerned

- Experience
- Acute care is provided by many clinicians
- Cost-effect in different hospital

Limitations

- The impact on actual decision making and diagnostic workup was not assessed.
- Responsibility
- EPUS is operator dependent.
- Might have a spectrum bias.

Conclusion

- Emergency physician–performed ultrasound appears to positively impact decision making and diagnostic workup for patients presenting to the ED with NSAP and should be studied further.

#2

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Original Contribution

Performance comparison of lung ultrasound and chest x-ray for the diagnosis of pneumonia in the ED☆

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Introduction

- use of chest x-ray as first line examination, despite its low sensitivity and specificity.
- CT as the golden standard
- Lung ultrasounds have shown a growing interest during the last few years in the diagnosis of pleural effusions, pneumothorax, pneumonias, or pulmonary contusions.
- result can be immediately available preventing any delay in the diagnosis process.

Patient enrolled

- Age 18 years and older
- suspected of infectious acute pneumonia with at least three of the following items:

✓ tympanic temperature >= 38 ° C
✓ Cough
✓ Dyspnea
✓ Heart rate >= 100 beats per minute
✓ Saturation of oxygen <= 92% in ambient air.

- The presence of a unilateral or a bilateral alveolar-interstitial syndrome was necessary to retain the ultrasound diagnosis of pneumonia.

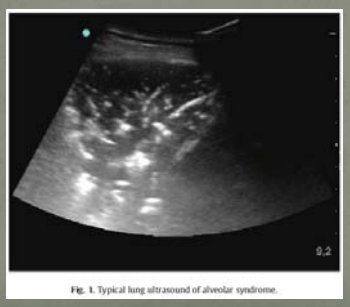


Fig. 1. Typical lung ultrasound of alveolar syndrome.

- The usual standard of care was not modified by the present study protocol and each patient underwent a chest x-ray after the lung ultrasound examination and subsequently referred to the appropriate health care service.
- The final diagnosis was performed by an independent senior expert, based on the examination of the complete medical chart including initial clinical findings, emergency laboratory test, chest x-ray data, and the results of thoracic CT scan if available.

- The primary end point was the respective diagnosis performances of lung ultrasound and chest x-ray to a correct final diagnosis.
- The secondary end point was the concordance of lung ultrasound and chest X-ray with thoracic CT scan when performed. The thoracic CT scan was considered as the gold standard method.

Results

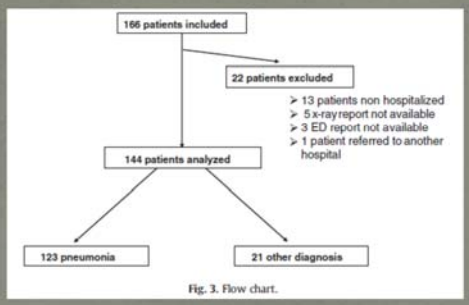


Fig. 3. Flow chart.

- Among the 49 cases with negative chest x-ray, final diagnosis of pneumonia was made 43 times by lung ultrasound.

Table 2
Respective performance of lung ultrasonography and chest x-ray for the diagnosis of acute pneumonia according to the delay from the onset of clinical signs

	Positive sonography	Positive chest x-ray	*P*
Signs <24 h, n = 44	43 (76%)	13 (23%)	< .001
Signs >24 h, n = 79	74 (93%)	61 (77%)	.003

Table 3
Respective performance of lung ultrasound, chest x-ray in the diagnosis of acute pneumonia according to the CT scan diagnosis

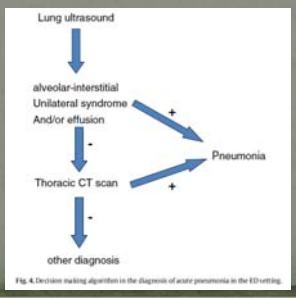
Pneumonia on thoracic CT scan	Positive sonography	Positive chest x-ray	*P*
N = 23	23	12	< .01

Limitation

- The primary end point chosen.
- Poor at detecting deep alveolar lesions.

Conclusion

- This study shows a clear superiority of lung ultrasound performed by a trained ED physician over the chest x-rays for the diagnosis of acute pneumonia.



Thanks for attention!!