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B-lines on chest ultrasound predicts elevated left ventricular diastolic pressure

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Background: Echocardiography and lung ultrasound are important tests for assessing left ventricular function in patients presented to the emergency department with acute pulmonary edema. Chest ultrasound is becoming an important tool in diagnosing acute pulmonary edema.

Aim: To investigate the relationship between the B profile on ultrasound chest and spectral tissue Doppler echocardiography (E/e' ratio) in patients presented with the suspicion of acute pulmonary edema.

Methods: This paper reports a prospective observational study of 61 consecutive patients, which was presented with symptoms and signs of pulmonary edema and B-profile detected by echocardiography with a 5 MHz curvilinear probe. Critical care physicians trained in ultrasound examination performed echocardiography and chest ultrasounds.

Results: Sixty-one participants were included in the study. Forty-seven of the 61 patients had a B-profile and 14 patients had an A profile. The mean E/e' level in the patients with B-profile was 20.8, compared with the mean level in the patients with an A-profile of 8.2 (CI=0.33–0.82). The distribution in the two groups differed significantly (p=0.003). Based on the value of E/e', the sensitivity and specificity were determined; the sensitivity of B profile on ultrasound was 92% (95% confidence interval (CI)=0.812–0.968), and the specificity was 91% (CI=0.623–0.98). The positive predictive value of the B-profile was 97% (CI=0.889–0.996), and the negative predictive value was 71% (CI=0.454–0.883). The systolic function in the subjects with a B-profile was below 50% in 74.3% of the subjects and normal in 25.7% of the subjects. All the subjects with B profile and systolic function >50% had elevated ProBNP and E/e' >15. An A-profile subjects had systolic function >55%.

Conclusions: Detecting the B-profile in lung ultrasound is highly sensitive and specific for elevated left ventricular diastolic pressures, regardless of the systolic function of the left ventricle which may help in diagnosing pulmonary edema.

Biography

Ossama Maadarani is trained in both Cardiology and Intensive Care Medicine. He developed a major interest in the application of whole body ultrasound and echocardiography in the critically ill. He developed modern protocols in daily use of ultrasound and echocardiography in intensive care unit. He has published number of publications in field of ultrasound in Intensive Care Medicine.

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