

THE ROLE OF LUNG ULTRASOUND SCORE IN PREDICTING OUTCOME IN SEPTIC CRITICALLY ILL PATIENTS

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INTRODUCTION

Sepsis represents an emerging public health problem worldwide. Lung ultrasound (LUS) is an effective and sensitive tool compared to the traditional chest auscultation and chest X-rays. Its use as a primary tool in the acutely hypoxemic or dyspneic patient gives an immediate information about his lung state and helps therapeutic decisions.

AIM OF THE WORK

The aim of this work was to evaluate the utilization of critical care lung ultrasound score and inferior vena cava (IVC) diameter in predicting outcome in septic critically ill patients.

SUBJECTS AND METHODS

In this prospective observational study, 85 patients were assessed from Critical Care Medicine Department of Alexandria Main University Hospital with sepsis or septic shock according to surviving sepsis campaign. Patients were subjected to complete history taking, full clinical examination and records e.g.: suspect source of sepsis, routine laboratory investigations, APACHE II score, chest X-ray, serum lactate level, hypoxic index and SOFA score. Patients were assessed upon admission to intensive care unit (ICU) with lung ultrasonography (U/S) using 8-region method, while IVC collapsibility and distensibility indices were measured using ultrasonography and echocardiography. The primary endpoints for this study were 7-day, 28-day mortality and secondary endpoints were ICU length of stay, hospital stay and mechanical ventilation (MV) days. Regarding mortality at day 28, patients were classified into two groups: Group I: survived group included “39 patients”. Group II: non-survived group included “46 patients”.

RESULTS

There was a significant decrease in total LUS score in survived group than non-survived group. There was a significant difference between survived and non-survived group regarding all items of LUS score in relation to outcome except upper right lung region (RT1) that had insignificant difference between both groups. There was a statistically significant increase in ICU length of stay, hospital stay and MV days in LUS >12 than LUS ≤12. The mortality was significantly higher in LUS >12 regarding 7-day mortality as well as 28-day mortality. At cut off value 10.0 of LUS score, the sensitivity in predicting mortality was 98.0%, specificity was 96.0% and total accuracy was 97.0%. The cut off value for IVC diameter was 1.66cm. The IVC diameter (U/S) had a sensitivity in predicting mortality 62.0%, specificity 58.0% and accuracy 61.0%. IVC diameter (U/S) was significantly positive correlated with IVC diameter measured by echocardiography.

Table: Relation between LUS score and ICU length of stay, hospital stay, duration of MV and mortality at 7th and 28th day.

Outcome	LUS score				t-test, P value
	LUSS ≤ 12 “n=45”		LUSS >12 “n=40”		
ICU length of stay/day	12.11±4.17		15.16±4.71		1.98, 0.040*
Hospital length of stay/day	18.15±3.75		22.09±5.62		2.62, 0.012*
Duration of MV/day	8.11±3.88		10.27±4.81		2.27, 0.011*
Mortality					
7 th day					
Survived	45	100.0	23	57.5	23.9
Non-survived	0	0.0	17	42.5	0.001*
28 th day					
Survived	38	84.4	1	2.5	57.26
Non-survived	7	15.6	39	97.5	0.0001*

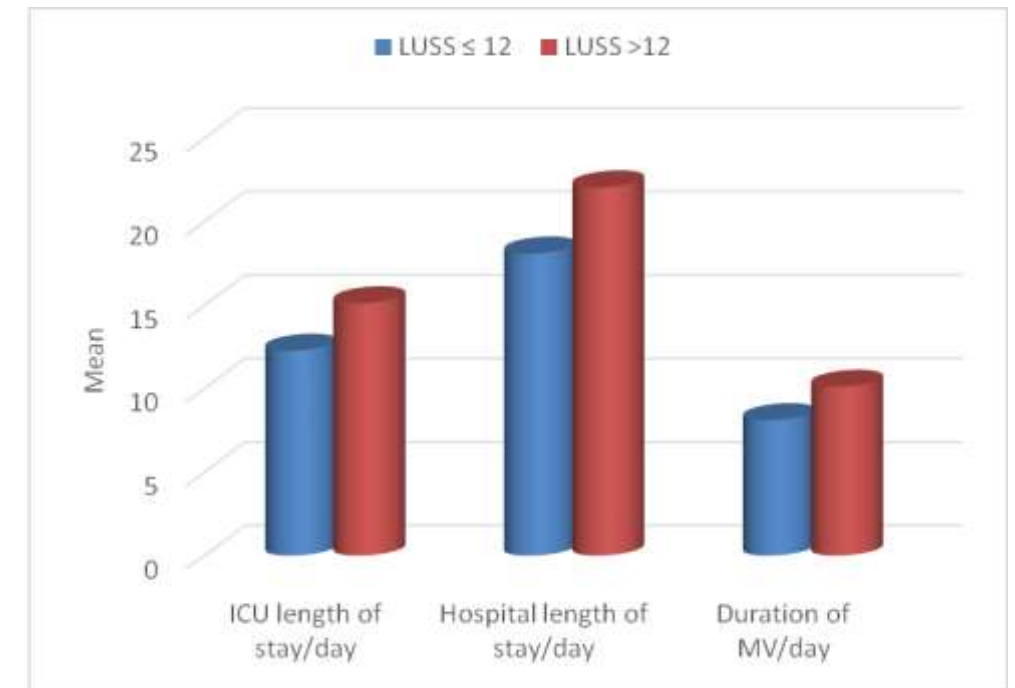


Figure: Relation between LUS score and ICU length of stay, hospital stay, duration of MV and mortality at 7th and 28th day.

CONCLUSION

Early LUS score within 24 hours of ICU admission helps predicting the outcome of septic critically ill patients. Higher LUS score was associated with higher mortality rate at day 7 and day 28. LUS score is a risk factor for 28-day mortality with cut off value 10. Increased IVC diameter (U/S) was associated with higher mortality rate (cut off value 1.66 cm).