PROGNOSTIC VALUE OF LEFT VENTRICULAR EJECTION TIME IN SEPTIC SHOCK PATIENTS

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INTRODUCTION

Sepsis is defined as life-threatening organ dysfunction due to dysregulated host response to infection, and organ dysfunction is defined as an acute change in total Sequential Organ Failure Assessment (SOFA) score of 2 points or greater secondary to the infection cause.

Septic shock occurs in a subset of patients with sepsis and comprises of an underlying circulatory and cellular/metabolic abnormality that is associated with increased mortality.

Assessment of LVET could provide valuable insights into the cardiovascular state of septic shock patients, helping to identify those at higher risk of poor outcomes. Understanding the prognostic significance of LVET in septic shock may offer a novel approach for predicting patient survival and tailoring individualized management plans.

AIM OF THE WORK

The aim of this prospective study was to evaluate the prognostic value of left ventricular ejection time in septic shock patients.

PATIENTS AND METHODS

The study was conducted on 40 adults septic shock patients who were admitted to the intensive care unit (ICU) in Alexandria Students Hospital. Myocardial performance index (MPI) is a numeric value, which could be obtained by using cardiac time intervals. This numeric value is defined as the sum of isovolumetric contraction time (ICT) and isovolumetric relaxation time (IRT) divided by ejection time (ET) and could be calculated for each ventricle individually.

RESULTS

Regarding ejection times after 72 hours, the minimum and maximum values observed in the survival group were 210.0 ms and 440.0 ms, respectively. The non-survival group had a minimum ejection time of 200.0 ms and a maximum time of 380.0ms. The mean ejection time for the survival group was 356.4± 63.57 ms, while the non-survival group had a mean ejection time of 272.7±45.53ms. The t-test, indicating a statistically significant difference in ejection times after 72 hours between the two groups (p= <0.001). (Table 1, Figue1)

Table1: Comparison between the two studied groups according to ejection time in the first 24 hours and after 72 hours

Ejection time (ms)	Survival (n = 20)	Non-survival (n = 20)	t	p
First 24 hours				
Min. – Max.	231.0 – 409.0	240.0 – 365.0	0.221	0.826
Mean ± SD.	317.0 ± 59.09	313.6 ± 35.95		
Median (IQR)	310.0 (259.5 – 375.0)	312.0 (290.0 – 344.5)		
After 72 hours				
Min. – Max.	210.0 – 440.0	200.0 – 380.0	4.784*	<0.001*
Mean ± SD.	356.4 ± 63.57	272.7 ± 45.53		
Median (IQR)	365.0 (320.0 – 412.5)	270.0 (240.0 – 311.0)		

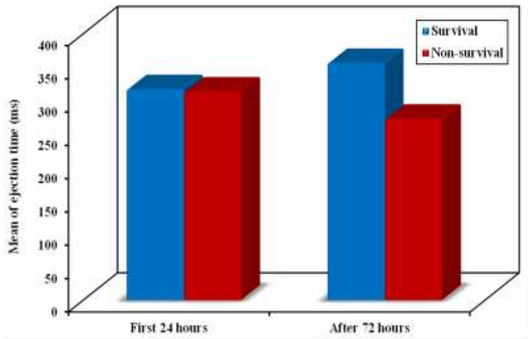

Figure1: Comparison between the two studied groups according to ejection time

There was significant positive correlation between left ventricular ejection time and duration of MV (p< 0.001, r= 0.725), and need for renal replacement therapy (p=0.002, r= 0.479).(Table 2, Figue2,3)

Table2: Correlation between left ventricular ejection time and secondary outcomes (morbidity rate).

	Ejection time (after 72 hour)	
	r	p
Length of ICU stay (days)	0.017	0.916
Duration of MV (days)	0.725**	< 0.001*
Need for renal replacement therapy	0.479**	0.002*

r: Pearson correlation, *: Statistically significant at p ≤ 0.05

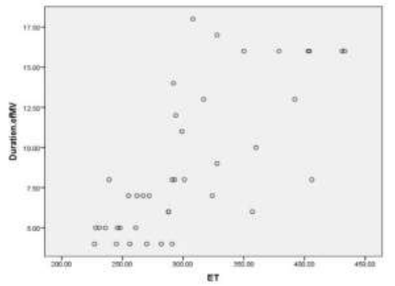

Figure2: Correlation between left ventricular ejection time and duration of MV.

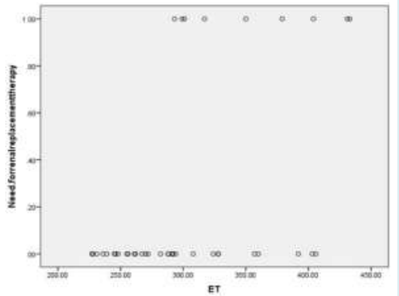

Figure3: Correlation between left ventricular ejection time and Need for renal replacement therapy.

CONCLUSION

At the end of our study we found that; left ventricular ejection time had a good prognostic value for morbidity and mortality in septic shock patients with a cut off value of 318msec above this value indicating improvement and below indicating deterioration.