ROLE OF ELECTRICAL CARDIOMETRY IN NON-INVASIVE ASSESSMENT OF FLUID STATUS IN PATIENTS PRESENTING WITH SEPTIC SHOCK

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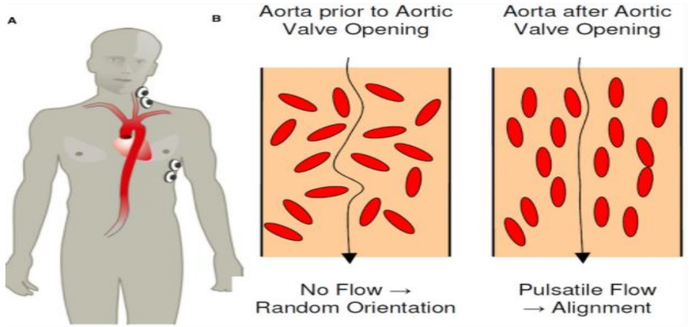
Introduction

Sepsis and septic shock are increasingly severe clinical syndromes of life-threatening organ dysfunction caused by a dysregulated response to infection leading to critical reduction in tissue perfusion, which can lead to acute failure of multiple organs, including the lungs, kidneys, and liver. Early recognition and treatment is the key to improved survival.

Start to resuscitate with intravenous fluids and sometimes vasopressors then control the source of infection and give empiric broad-spectrum antibiotics directed at most likely organisms and switch quickly to more specific drugs based on culture and sensitivity results.

Electrical Cardiometry (EC) is a method for the non-invasive monitoring of stroke volume (SV), cardiac output (CO), and other hemodynamic parameters. Its concept is based on electrical impedance and erythrocytes arrangement during cardiac cycle. EC is very helpful in assessment of fluid status so, complications of volume overload could be prevented.



Fig(1): Electrical Cardiometry:A:Electrodes positioning. B: Erythrocytes distribution during diastole and systole.

Aim of the work

The aim of this work is to assess the value of electrical cardiometry in assessment of fluid responsiveness in patients presenting with septic shock

PATIENTS AND METHODS

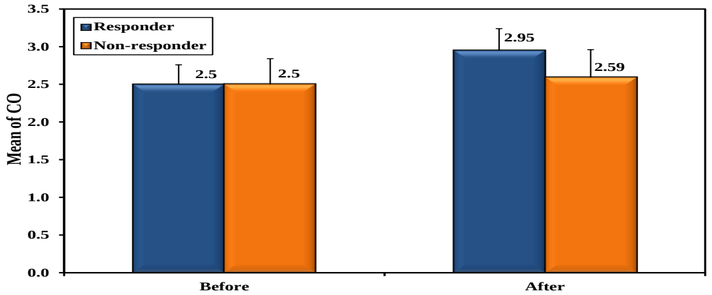
Forty Patients with septic shock admitted to Critical Care Medicine Department in Alexandria University Hospitals according to sample size calculation.

The following data was collected from every patient after enrollment into the study: Demographic data, complete medical history, GCS and quick sofa were collected. Routine lab including lactate level and sepsis workup was done for all patients. Forty patients presented with sepsis (MAP < 65 mmHg) and marked tissue hypoperfusion i.e., lactate level ≥ 4 mmol/L were enrolled in our study. Fluid resuscitation (30 ml/kg Normal Saline 0.9%) was administered. Fluid response was defined as MAP ≥ 65 mmHg with lactate level <4 mmol/L and increased cardiac output (CO), Fluid responsiveness protocol using noninvasive electrical cardiometry EC (≥ 10% increase in stroke volume in response to 5 ml/kg fluid bolus). Outcome measures were including:

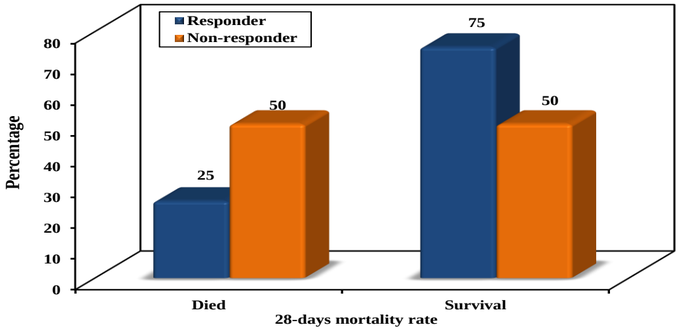
Length of the ICU stay.

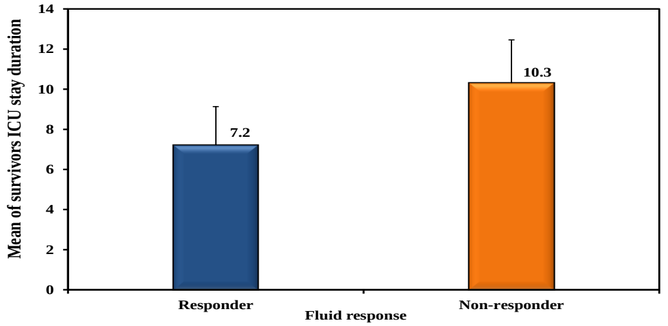
ICU mortality rate.

Results



Fig(2): Comparison between the two studied groups according to CO.





Conclusion

Measuring cardiac output by electrical cardiometry could guide fluid therapy in patients presenting with septic shock as a predictor of fluid response and may improve outcome.