ASSESSMENT AND MANAGEMENT OF ACUTE HEART FAILURE PATIENTS GUIDED BY ELECTRICAL CARDIOMETRY

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Introduction

Heart failure is defined as clinical syndrome, not a specific pathological diagnosis, and is characterized by primary symptoms such as shortness of breath, fatigue, and swelling in the ankles. These may be accompanied by signs as elevated jugular venous pressure, fluid accumulation in the lungs (pulmonary crackles), & peripheral edema.
Acute heart failure (AHF) is characterized by the abrupt or gradual onset of symptoms and/or signs of heart failure that are severe enough to necessitate urgent medical intervention, often resulting in an unplanned hospital admission or visit to the emergency department.
Electrical cardiometry is a non-invasive, continuous method for monitoring hemodynamics. It detects variations in the thoracic electrical impedance across different phases of the cardiac cycle to assess cardiac output (CO).

Aim of the Work

The aim of this study was to assess the role of electrical cardiometry in hemodynamic monitoring in patients diagnosed with acute heart failure to guide treatment.

Patients and Methods

Patients: 50 patients diagnosed with acute heart failure, admitted to critical care units at Alexandria university hospitals, managed by either the traditional methods of management or by electrical cardiometry.
Patients were randomly assigned into two groups
Group (A): managed by traditional methods.
Group (B): managed by electrical cardiometry.
Methods: a prospective controlled study was conducted:
The following data were collected from every patient after enrollment and during the period of the study: Age, sex, past medical history, Laboratory investigations including Pro-BNP, Vital signs, ejection fraction .Group A patients were managed by traditional methods using IVC assessment, lung ultrasound and CVP measurement, Group B patients were managed by parameters of electrical cardiometry.

Results

Table 1: Comaprison between both groups regarding use of medications

	Group A (n = 25)		Group B (n = 25)		χ^2	p
	No.	%	No.	%		
Inotropes	6	24.0	7	28.0	0.104	^{FE}p=0.747
Fluids	2	8.0	3	12.0	0.222	^{FE}p=1.000
Diuretics	23	92.0	22	88.0	0.222	^{FE}p=1.000
Vasopressors	7	28.0	10	40.0	0.802	0.370
Vasodilators	8	32.0	9	36.0	0.089	0.765

Table 2: Comparison between both groups regards outcome

	Group A (n = 25)		Group B (n = 25)		Test of Sig.	p
	No.	%	No.	%		
Mortality						
Acute decompensated heart failure	0.0	0.0	0.0	0.0	–	–
Hypertensive pulmonary edema	0.0	0.0	0.0	0.0	–	–
Cardiogenic shock	3	100.0	4	100.0	χ^2=0.166	^{FE}p=1.000
Heart failure hospital length of stay (days)						
Acute decompensated heart failure						
Min. – Max.	2.0 – 3.0		2.0 – 4.0		U= 61.50	0.258
Mean ± SD.	2.64 ± 0.50		3.0 ± 0.74			
Median (IQR)	3.0 (2.0 – 3.0)		3.0 (2.50 – 3.50)			
Hypertensive pulmonary edema						
Min. – Max.	2.0 – 3.0		2.0 – 4.0		U= 29.50	0.562
Mean ± SD.	2.62 ± 0.52		2.89 ± 0.78			
Median (IQR)	3.0 (2.0 – 3.0)		3.0 (2.0 – 3.50)			
Cardiogenic shock						
Min. – Max.	2.0 – 4.0		3.0 – 5.0		U= 7.50	0.347
Mean ± SD.	3.0± 1.0		3.75 ± 0.96			
Median (IQR)	3.0 (2.0 – 4.0)		3.50 (3.0 – 4.50)			

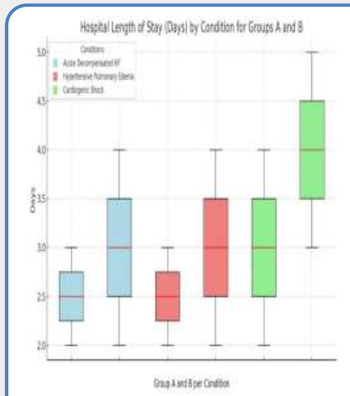

Figure 1:
Comparison between both groups regarding hospital length of stay .

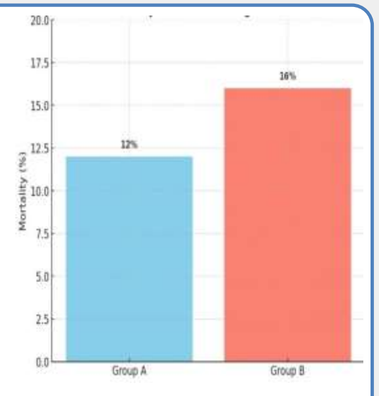

Figure 2:
Comparison between both groups regarding mortality.

Conclusion

Electrical cardiometry is a simple non-invasive tool that can measure variable hemodynamic parameters.
Use of electrical cardiometry in management of patients diagnosed with acute heart failure is equivalent to traditional methods as regards use of fluids, medications (diuretics, vasodilators, vasopressors and inotropes), need for ventilation, hospital stay and mortality