

COMPARATIVE STUDY BETWEEN DIFFERENT CRYSTALLOID FLUIDS EFFECT ON SEQUENTIAL ORGAN FAILURE ASSESSMENT SCORE IN PATIENTS WITH SEPTIC SHOCK

Akram Muhammad Fayed, Mohamed Abd El-Alim Abd El-Hady, Samaa Abdelfatah Ebrahim Daoud

Department of Critical Care Medicine, Faculty of Medicine, Alexandria University, Alexandria, Egypt.

Introduction

Sepsis is a leading cause of morbidity and mortality in critical care patients , Fluid therapy represents one of the cornerstones of resuscitation treatments in sepsis, in order to increase oxygen delivery and hemodynamics during circulatory failure. The SOFA score is one of the best validated disease-oriented end points available for critically ill patients and is correlated with mortality risk Se We hypothesise that the administration of 5% Dextrose for fluid maintenance and drug infusion in critically ill septic shock patients will lead to a decrease in SOFA score when compared to administration of 0.9% NaCl.

Aim of the work

The aim of this study is to compare the efficacy of maintenance fluid therapy by 5% dextrose compared to 0.9% NaCl in reducing organ dysfunction in critically ill sepsis patients.

Patients and Methods

Among patients crtical care units, adult patients (aged 18 years or older) with septic shock were included. Initial resuscitation in ER was done according to surviving sepsis campaign then patients were randomized one of two arms: **The Dextrose arm:** 50% of fluids given in the ICU in the form of fluid boluses or infusions was given in the form of water; D5%. The other 50% was given in the form of NS. Once resuscitation targeted parameter was achieved (MAP>70 mmHg for at least three hours & lactate clearance),⁽⁶³⁾ all fluids given e.g., vehicle of drug infusion, maintenance or even boluses were given in the form of water; D5% for first 72 hours in the ICU. The treating clinicians determine the volume and infusion rate of each individual patient. **The Saline arm** ⁽⁶⁴⁾: Patients enrolled in this group received an intravenous infusion of 0.9% NaCl as the routine maintenance fluid and as a vehicle of drug infusion and boluses during the first three days in ICU. The treating clinician determines the volume and infusion rate of each fluid.Other fluids (resuscitation, nutrition, and blood products) are given as per the discretion of the treating clinician. **Outcome measures,Primary outcome** ICU Organ system failure assessed by (SOFA scores at 96 hours.**Secondary outcomes**,ICU length of stay, Hospital length of stay (date of discharge).

Results

Table (1) :Mean arterial blood pressure and heart rate of the studied groups

			Dextrose group (n=30)	Saline group (n=30)	P value
MAP (mmHg)	On admission	Mean ± SD	65.9 ± 4.39	67.4 ± 4.92	0.198
		Range	60 - 73	60 - 75	
	2 nd day	Mean ± SD	71.2 ± 5.17	69.8 ± 6.5	0.371
		Range	60 - 80	60 - 80	
	3 rd day	Mean ± SD	74.6 ± 7.65	68.1 ± 5.38	<0.001*
		Range	62 - 88	60 - 80	
HR (beats/min)	On admission	Mean ± SD	111.37±6.35	109.07±5.53	0.149
		Range	100-120	100-118	
	2 nd day	Mean ± SD	97.8 ± 7.38	93.6 ± 10.84	0.082
		Range	85 - 110	70 - 110	
	3 rd day	Mean ± SD	84.7 ± 9.62	100.8 ± 5.97	<0.001*
		Range	71 - 99	90 - 110	

Table (2) : Laboratory investigation of the studied groups

			Dextrose group (n=30)	Saline group (n=30)	P value
Hb (g/dL)	On admission	Mean ± SD	9.5 ± 0.33	9.4 ± 0.32	0.301
		Range	9 - 10	9 – 10	
	2 nd day	Mean ± SD	10.6 ± 0.93	10.7 ± 0.85	0.698
		Range	9.1 - 11.8	9.1 - 11.9	
	3 rd day	Mean ± SD	10.9 ± 1.03	11 ± 0.93	0.548
		Range	9.1 - 12.4	9.4 - 12.5	
Platelets (×10 ³ / µl)	On admission	Mean ± SD	268.53±73.48	293.1±57.65	0.155
		Range	159-400	173-392	
	2 nd day	Mean ± SD	287.47±67.59	311.7±86.08	0.280
		Range	194-397	150-418	
	3 rd day	Mean ± SD	319.67±77.15	308.37±94.61	0.614
		Range	151-436	153-439	
Leukocytes (×10 ³ / µl)	On admission	Mean ± SD	17.63±1.45	17.8±1	0.606
		Range	14-20	16-19	
	2 nd day	Mean ± SD	12.51±0.98	16.09±1.16	<0.001*
		Range	11-13.9	14.3-18	
	3 rd day	Mean ± SD	6.98±2	8.13±1.41	0.013*
		Range	4.8-10.4	4.8-10.6	
Lactate (mmol/L)	On admission	Mean ± SD	4.9 ± 0.73	5 ± 0.87	0.523
		Range	4 - 6	4 – 6	
	2 nd day	Mean ± SD	3.5 ± 0.57	4.4 ± 0.5	<0.001*
		Range	2 – 4	4 – 5	
	3 rd day	Mean ± SD	1.5 ± 0.51	3.8 ± 0.85	<0.001*
		Range	1 - 2	3 – 5	

Table (3) : SOFA score and delirium of the studied groups

			Dextrose group (n=30)	Saline group (n=30)	P value
SOFA	On admission	Mean ± SD	13.5±4.5	12.27±4.78	0.308
		Range	5-20	5-19	
	At 3 rd day	Mean ± SD	6.5±4.02	10.47±4.12	<0.001*
		Range	1-12	4-18	
Delirium	On admission		17 (56.67%)	20 (66.67%)	0.595
	At 3 rd day		9 (30%)	18 (60%)	0.027*
ICU stay (days)		Mean ± SD	6 ± 0.83	7.8 ± 1.81	<0.001*
		Range	5 - 7	5 - 10	
Hospital stay (days)		Mean ± SD	9.7 ± 2.66	20.4 ± 3.16	<0.001*
		Range	5 - 15	15 - 25	
Mortality rate			12 (40%)	21 (70%)	0.037*

Overall survival rate of the studied group regarding the hospital stay

Conclusion

Dextrose 5% could be used as an adjuvant resuscitation therapy with concurrent routine resuscitation protocols in critically ill patients with septic shock as it showed significant improvement regarding SOFA score, delirium ICU and hospital stay, and mortality compared to normal saline