



شبكة المعلومات الجامعية
التوثيق الإلكتروني والميكرو فيلم

بسم الله الرحمن الرحيم



HANAA ALY



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شبكة المعلومات الجامعية التوثيق الإلكتروني والميكروفيلم



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جامعة عين شمس

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Albumin as Early Fluid Bolus Therapy after Cardiac Surgery in the Critical Care Units

Thesis

*Submitted for Partial Fulfillment of master's degree in
Intensive Care.*

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بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

قالوا

سبحانك لا علم لنا
إلا ما علمتنا إنك أنت
العليم العظيم

صدق الله العظيم

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List of Contents

<i>Items</i>	<i>Page</i>
List of Tables	II
List of Figures	III
List of Abbreviation	IX
Introduction	1
Aim of the Work	4
Review of Literature	5
Patients and Methods	52
Results	58
Discussion	70
Summary	79
CONCLUSION	82
RECOMMENDATIONS	83
References	84
Arabic Summary	١

List of Tables

<i>Table No.</i>	<i>Title</i>	<i>Page</i>
Table (1)	Tests and parameters of fluid responsiveness.	7
Table (2)	Comparison between the two studied groups regarding Age, Sex, BMI, Smoking, HTN, Diabetes, Congestive cardiac failure, Peripheral vascular disease	64
Table (3)	Comparison between the two studied groups regarding Serum creatinine (mg/dL), Serum Albumin (g/L), Operation, Admission type, and APACHE III score.	65
Table (4)	Comparison between the two studied groups regarding Primary outcome and Secondary outcomes.	68
Table (5)	Comparison between the two studied groups regarding ICU, Hospital, Duration of mechanical ventilation, Total dose nor epinephrine/kg in the first 24h post-op (microg/kg), Time to cessation of nor epinephrine infusion (h), Delta serum creatinine at 24 h post-op (mg/dl), Delta serum chloride at 24 h post-op (mmol/L) and Renal replacement therapy post-operatively in ICU	71
Table (6)	Comparison between the two studied groups regarding Discharge Status from hospital.	75

List of Figures

<i>Fig. No.</i>	Title	<i>Page</i>
Fig.(1)	Factors that can affect a fluid assessment.	20
Fig.(2)	Comparison between the two studied groups regarding sex.	65
Fig.(3)	Comparison between the two studied groups regarding age.	65
Fig.(4)	Comparison between the two studied groups regarding the APACHE III score.	67
Fig.(5)	Comparison between the two studied groups regarding the net fluid positive balance.	69
Fig.(6)	Comparison between the two studied groups regarding Discrete number of fluid bolus (es) in the first 24 h.	69
Fig.(7)	Comparison between the two studied groups regarding number of Total volume of resus fluids in first 24 h.	70
Fig.(8)	Comparison between the two studied groups regarding total volume of fluid in the first 24 h.	70
Fig.(9)	Comparison between the two studied groups regarding ICU.	72
Fig.(10)	Comparison between the two studied groups regarding to hospital stay.	72
Fig.(11)	Comparison between the two studied groups regarding duration of mechanical ventilation.	73
Fig.(12)	Comparison between the two studied groups regarding total dose of nor epinephrine in the 1 st 24 hrs postoperative.	73
Fig.(13)	Comparison between the two studied groups regarding Time to cessation of nor epinephrine infusion.	74
Fig.(14)	Comparison between the two studied groups regarding delta serum creatinine at 24hrs post-operative.	74

List of Abbreviations

<i>GD</i>	<i>Graves' Disease</i>
ABG	Arterial Blood Gases
AKI	Acute Kidney Injury
AUC ROC	Area Under the Receiver Operating characterizing Curve
BUN	Blood Urea Nitrogen
CI	Cardiac Index
CO	Carbon Oxide
CPB	CardioPulmonary Bypass
CVP	Central Venous Pressure
dIVC	distensibility Index for the IVC
ECF	ExtraCellular Fluid
EEO	End-Expiratory Occlusion
FBT	Fluid Bolus Therapy
HES	Hydroxyl Ethyl Starch
IBM SPSS	Statistical Package for Social Science
LV	Left Ventricle
MAP	Mean Arterial Pressure
NS	Non-Significant
NYHA	New York Heart Association
PPV	Pulse Pressure Variation

PRBC	Packed Red Blood Cells
RAP	Retrograde Autologous Priming
RCT	Randomized Clinical Trials
RRT	Renal Replacement Therapy
RV	Right Ventricle
S	Significant
S1P	Sphingosine-1-phosphate
SID	Strong Ion Difference
SVV	Stroke Volume Variation
VTI	Velocity Time Integral

INTRODUCTION

Fluid bolus therapy is ubiquitous in the ICU. It is classically given to treat hemodynamic instability (*Cecconi et al.;2014*). This is a common situation in patients after cardiac surgery (*Parke et al.;2014*). Classically, the main target here is intravascular volume expansion in order to increase mean arterial pressure (MAP) and cardiac index (CI) (*Vincent;2013*).

The timing of fluid bolus administration, the *speed* of delivery, the type and volume of fluid, the clinical indications and physiological targets, and the evaluation of response are still not fully understood (*Cecconi et al., 2015, Toscani et al., 2017, Glassford et al., 2014*).

In ICU, only 50% of patients with hemodynamic instability appear responsive to fluid bolus therapy (*Bentzer et al.;2016*). Maintaining fluid homeostasis during and after cardiac surgery is a daily challenge and is compounded by the endothelial dysfunction triggered by extracorporeal circulation (*Koning et al.;2016*).

There is clinical and institutional variation in fluid selection. Crystalloids are still the most currently used in post-cardiac surgical patients (*Parke et al.;2014*). Studies reported dissipation of their cardiovascular effect early within 10

minutes following the end of fluid infusion after surgery (*Aya et al.;2016*).

A recent European survey reported that crystalloid solutions are now preferred, perhaps as a consequence of safety concerns related to some synthetic colloids such as hydroxyl ethyl starch (HES) (*Reddy et al.;2016, Protsyk et al.;2017*). Artificial colloids, such as HES and gelatin, may have a longer lasting effect on hemodynamics, but they have been associated with significant risks (*Myburgh et al., 2012, Perner et al., 2012, Haase et al., 2013, Lewis et al., 2018*).

Many clinicians acknowledge that colloids traditionally often have been reserved for rapid plasma volume expansion and fluid resuscitation, even if evidence and beliefs vary widely. After exclusion of patients with traumatic brain injury, (*Medicine;2007*). human albumin solutions have repeatedly been shown to be safe and may achieve longer lasting hemodynamic effects (*Mårtensson et al., 2018, Medicine, 2004, Bihari et al., 2019*).

Albumin was evaluated in two different concentrations against normal saline in two trials; 4% albumin in the “SAFE” study and 20% albumin in “HAS FLAIR” pilot study. But, a lot of arguments evolved against these two trials, especially HAS

FLAIR study (*Medicine;2004, Wigmore et al.;2019*). No clear winner in this ongoing debate can be declared in the absence of robust evidence.

Also, fluid resuscitation with 20% albumin solutions have been associated with decreased fluid requirements and less fluid accumulation in ICU patients, compared with iso-oncotic (4 – 5%) albumin (*Otten;2014, Mårtensson et al.;2018*).

AIM OF THE WORK

The aim of this study is to investigate the cardiovascular effect of using 20% albumin in patients after cardiac surgery.