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Intravenous Fluid Therapy for Adult Surgical Patients and Emergency Surgery

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ABSTRACT

The Emergency Surgical team (including surgeon, intensive care physician and anesthesiologists) should work together for quality, quantity and duration of fluid IV supply in the perioperative period. Being a leader of surgical of team, surgeon's role is important. We use hand search conference abstracts, seminar lectures, talks and symposium research papers. We have searched 200 published research paper, out of which selected as shown in reference. We also introduce new study. Two authors have identified selected the article based on same criteria. Any discrepancy was resolved. Current research result are insufficient to show effects of fluids in perioperative condition especially type and quality of IV fluid .Large studies are suggested to assess these relevant clinical outcomes.

Keywords: *The Emergency Surgical team, Duration of fluid IV, Quality and quantity of IV fluids, Surgeon's Role.*

1. INTRODUCTION

Almost all hospitalized patients receive intravenous fluid to avoid dehydration and as diluents for drug administration.¹ An intravenous fluid therapy has become routine and common. Interventions fluid administered to patients in emergency surgery settings correct use of innervations fluid administered to patients in emergency settings is lifesaving. On other hand ,certain volume and types of IV Fluid could be harmful to patients may have risk of death .Inappropriate fluid therapy is preventable .It is individualized fluid therapy is advisable.

The research found that in appropriate fluid therapy, rarely reported .It may occur in as many as one in five patients². Frighen monitarition in fluid therapy management is observed³. In high risk patients, surgery and emergency surgery ,hourly volume and balance crystalloids also must monitor.

Though the intravenous fluid therapy interventions in emergency surgery, the ideal fluid does not exist .It is reported that first choice of Fluid (crystalloids or colloids) is depend on the country or region of the country⁴.

To avoid post-operative complications associate with fluid loss during any type of surgery is important part of the anesthetic strategy. In the case emergency surgery, it is surgical team responsibility. Finding the basic outline of intravenous fluid replacement is the main goal of many researchers and surveyors. These fluids must be considered as a drugs because they have doses ranges, types, indication and effects and side effects. The duration need to implement emergency procedure has an impact on both the fluid balance and fluid administration ⁴⁻⁷ (chart 1)

Proper type of fluid or mixture of fluid has standard guideline. The general anesthesia cause fluid loses. Even nonfunctional fluid losses cause disruption in extra cellular volume results shift of the fluids out of the blood vessels cause by povolemia.

In emergency surgery through preoperative care including intravenous fluid managed by a team of anthologist, surgeons and emergency care doctors. In north America surgeon play the highest role.⁸ In Europe and Japan ,Intravenous fluids are managed by an anesthesiologist⁹. On other hand , intraoperative fluid management is done only by an anesthesiologist and emergency care doctor ,not by surgeon in many countries. (Graph-1)

2. DISCUSSION

While using IV fluids in emergency surgeon case, there are several important points should take in to account points are 1. Which fluids should be used? 2. What will be dose? 3. How long and when if may administrated? 4. How to supervise or monitor side effect?

According to results from various research papers, there is relation between some unwanted outcomes with different administrated fluids.⁽¹⁰⁾

The body is 60% water by weight almost 70% of our body contains fluid .If we consider an average weight 75kg than it contain 45L of water this 45L goes in to two parts¹¹. Intracellular space (=30 L)and (B) extra cellular space (=15L) which is divided further in two parts.(1) interstitial(12L) and plasma (3L) .To maintain these average water intake is about 2 to 3 L. Per day for and adult¹². (Table-1)

Stage wise recommendation .There are three stage in any type of surgery: 1. Preoperative stage. 2. Intra operative stage. 3. Post operative stage.

A. Preoperative fluid management

In patients without gastric and diabetes complication non particles oral fluid may not be withheld for more than two hours before anaesthesia.¹³ carbohydrate rich beverages 2-3 h before anesthesia may improve patients well-being .¹⁴⁻¹⁵

B. In emergency surgery case, surgeon's leadership and teamwork is an important .though it is non-technical skill, like IV fluid administration become part as team work with sub leader.

The optional fluid prescription for emergency surgery patients is challenge for surgery team. It intravenous fluid prescription is not adequate ,Acute kidney injury may occur and patients is at risk.

The 4D Model:

For fluid therapy ,We can fluid as drug and hence dosing and duration is also important .It is also related withhold/Withdraw when fluid is not needed .De-escalation prevent over load of fluid.¹¹⁻¹² (Figure-1)

Important notes:

1. The saline solutions have effects on cardiac contractility, gastric perfusion and gastric motility.¹⁶
2. All Colloids are big molecule and hence large molecular weight than crystalloids and do not cross the endothelium into the interstitial fluid easily. ¹⁷
3. Use of colloids compared to crystalloids for fluid replacement makes little or no difference to number of critically ill people who die.¹⁷
4. In emergency surgery case, patient may experience excessive fluid loss .Hence Fluid (IV) management is important and should be monitored.
5. Research states using starches probably increase the need for blood transfusion and slightly increase the need for renal replacement therapy. ¹⁷
6. In emergency surgery case, patient may lose large amount of blood or may have serious condition. Patients also may have additional fluids and also additional precaution for preventations of infections
7. In the burns case emergency surgery needs special care and more amount of fluid.
8. If patients with cardiopulmonary morbidity, special monitoring methods are considered.¹⁸
9. Research shown that the saline may cause hyper choleric metabolic acidosis, Inflammation, hypotension, acute kidney injury. ¹⁸
10. In the case of emergency surgery, critically ill patients, use of balance crystalloids rather than saline may have potential to reduce morbidity and mortality.
11. To prevent hemolytic, Dextrose is frequently added to hypotonic fluids so that they are isometric during IV fluid admistration.²¹
12. Dextrose in water (DSW) is a source of solute –free water as a diluents for drug administration.
13. IV fluid load is capable of reducing hypotension caused by the induction of general /regional anestha. however, research regarding a preload have been discouraging.²²
14. Normal Saline was associated with a decrease in blood pH and strong ion difference(SID).²³
15. When the central venous pressure is not raised and the diagnosis of hypovolemia is in doubt, the response to a bolus infusion of 200ml of a suitable Iv fluid should be tested.¹⁹⁻²⁰

3. SUGGESTIONS

1. Individualized fluid therapy for emergency surgery patients , has potential to reduce risk to patients .⁽²⁵⁾
2. In the case of emergency surgery (or any type of surgery).when used appropriately i.v. fluids can improve outcomes.⁽²⁶⁾
3. Way back ,Fluid and saline solutions were carefully administered during the antidiuretic preoperative phase of surgery ,to maintain balance and prevent weight gain.²⁷In modern day, this idea is replace by surgical patient need exceptional high volume of fluid , irrespectively of measured requirements on other hand ,despite of the lack of the studies supporting benefit of recommended high fluid replacement ,actual researchers have demonstrate that maintenance of body weight is associated with better outcome.²⁸
4. Preoperative iv fluid are basic need in most of emergency cases. It depends on individual case can be assess by simple test and careful physical examination.
5. There is partly responsibility about IV fluid management and research. Surgery may remain being an art but as surgeons may convert surgery in evidence based art with all other associate branches.

6. IV fluids should only be given to the patients with a predicted positive fluid response. The testing volume is 250ml. While testing for vi fluid 100ml may be used
7. In emergency surgery ,surgeon needs to operate under extreme stress and time constraints .The dynamics of how emergency surgeon teams function ,IV fluid administration is also fundamental to ensuring the best performance.

Limitation of this article:

There are many studies or survey did not resister their studies before they started. Some of them did not clearly mention study method .There are very few studies are systematic in all sense. Since we have few studies has reports which fulfill all criteria. To develop good quality research in surgery is challenges because non-multidisciplinary approach may be associate with operation theatre and its supporting staff.

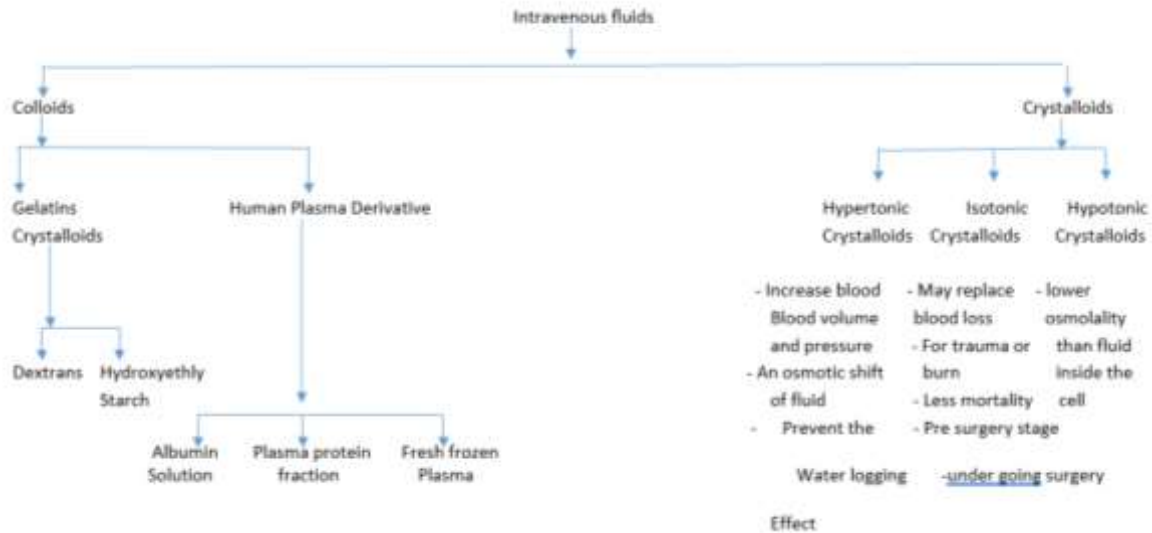


CHART-1

Table-1

Blood and lymph are the two main body fluid in human body	Type	Properties		
	Intracellular body Fluid	Molecules ,Fluid volume is stable		
	Extra cellular body fluid	Interstitial	Lymph lymphocytes nutrients gases	
		Plasma	Water, dissolved ions, suspended, Proteins dissolved gases.	
	Trascellular Fluid	Electrolytes such as sodium, potesium, bicarbonate and chloride ions.		

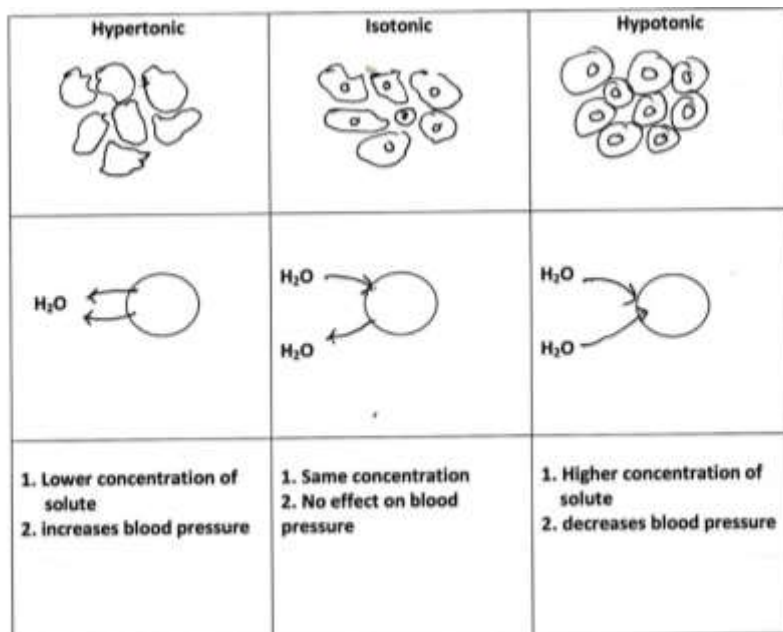


Figure - 1

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