IV FLUIDS: ROLE OF VOLUME RESUSCITATION IN SEPTIC SHOCK

Catherine Beni, MD, PhD
T32 Research Fellow
University of Washington, Department of Surgery
OBJECTIVES

- Introduction
- Adverse Effects + Controversy
- Next Steps
Initial Resuscitation

≤ 3 hours
- Check lactate
- Blood cx before antibiotics
- Start broad-spectrum antibiotics
- 30 mL/kg crystalloid

≤ 6 hours
- Start vasopressors for unresponsive HoTN
- Persistent HoTN or lactate ≥ 4:
  - CVP
  - ScvO₂
- Recheck lactate
SURVIVING SEPSIS: 2016 GUIDELINES FOR IVF

**Resuscitation Goals**
- CVP 8-12 mmHg
- MAP $\geq 65$
- UOP $\geq 0.5$ cc/kg/hr
- ScvO$_2$ 70%
- Lactate normalization

**Additional IVF**
- Albumin if substantial crystalloids required
- Fluid challenge for continued IVF
- Administer additional fluids if improvement in static or dynamic variables
WHERE DO WE GET 30 mL/kg?

2001

- Rivers et al. landmark study on EGDT
  - Follow-up single- and multi-centre RCTs in China

2014 - 2015

- ARISE, ProCESS, and ProMISE trials: EGDT had no change in mortality for septic shock vs standard care
  - EGDT patients received more IVF (~500 mL)
IVF: WHY DO WE CARE?

**Adverse Outcomes**

- Ventilator days, ARDS
- Need for RRT, length of time on RRT
- Risk of wound infection
- ICU LOS
- Discharge to SNF > home
- New inability to ambulate
### IVF: Why Do We Care?

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**Prevalent Problem**
- 35% of patients suffer volume overload by ICU discharge
- Patients are equally likely to receive additional fluids regardless of whether they respond to a bolus
- Fluid responsiveness is assessed prior to bolus ~ half of the time
IVF: WHY DO WE CARE?

Controversy?

- Unclear if adverse effects are causative or purely correlated
  - Expect sicker patients to receive more IVF
- Unclear how much impact clinician education may have on outcomes
- Unclear if fluid restrictive strategies can improve outcomes
FLUID RESTRICTIVE STRATEGIES: PAUCITY OF EVIDENCE

9 RCTs
Looking at restrictive vs conservative fluid strategies in sepsis

4 RCTs
Strategies differed in IVF volume

5 RCTs
Strategies did NOT differ in IVF volume
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Meta-analysis

No difference in any of:
- Mortality
- Vent free days
- Pressor use
- ICU LOS
- RRT need/duration
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But...
- Total n: 415
- Grossly underpowered
  - < 15% of required patients to detect 15% difference in RR or 1 day difference
NEXT STEPS?

- Evidence for volume, rate, and frequency of IVF administration in septic shock is lacking in both quantity and quality
- There is a **serious need for large, multi-center RCTs** comparing IVF administration strategies
REFERENCES


