

Women's & Children's Clinical Service Centre

Back to Basics
FLUID BALANCE

Midwifery Practice Education Team

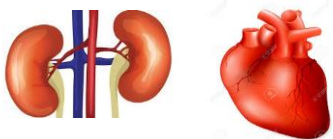
2019



What do we know

- Total Body water in pregnancy can increase by up to 8litres
- Oestrogens increase renal sodium absorption and water retention
- Disturbances in the cardiovascular system and the regulation of fluid balance can lead to changes in blood pressure
- In the last trimester water load is not as easily excreted therefore fluid regulation is more vulnerable to over and under load

- The re absorption capacity of the renal tubules for sodium chloride and water Increases by as much as 50%



Blood Osmolarity

- Electrolyte concentrations have a big role in fluid movement between the fluid spaces.
- Osmolarity is the measure of osmoles concentration within a fluid.
- Sodium is the most abundant extracellular electrolyte, therefore the body needs sodium to maintain proper extracellular fluid concentration
- Normal blood sodium range: 135-145mmols/L
- High sodium levels are seen in dehydration (high osmolarity)
- Low sodium levels are seen in fluid overload (low osmolarity)
- High osmolarity attracts fluid from the connecting fluid space by **osmosis** and low osmolarity attracts sodium by **diffusion**.
- Using osmosis and diffusion helps preserve vascular fluid volume and overall fluid distribution in the body.

Albumin

- Albumin is a non-electrolyte that has a big role in fluid balance.
- It is a protein produced in the liver.
- It comprises about 60% of the total blood serum protein.
- As it is a large and abundant molecule, it creates **oncotic pressure** to draw water in from the interstitial space into the intravascular space.
- Normal blood serum range: 35-48 g/L
- Low albumins are often seen in unwell patients (e.g. sepsis)
- Low albumin causes low oncotic pressure, fluid exits the vascular space, often resulting in oedema.
- (Normal Albumin in pregnancy?)

Fluid balance

Discussion

- Why it is important
- How do you monitor it
- What fluids do you include
- What route of administration are there
- Types of fluid loss

All of the physiological changes to maternal fluid balance through the stages of pregnancy emphasise the need for careful fluid management

ESPECIALLY
**In patients with underlying
medical disease or acute illness**



Fluid Balance – Fluid Overload

Pulmonary oedema is uncommon but is associated with increased maternal morbidity and mortality

Risk Factors for fluid overload

- Use of tocolytic
- oxytocin
- Maternal cardiac disease
- Severe sepsis
- Pre eclampsia
- Iatrogenic fluid overload **THINK** of those fluid challenges

EXAMPLE

- Patient A
- P0 38 weeks gestation
- Pre eclampsia
- Free oral fluids
- Epidural inserted at 04:40
- Fluids – 04:40 litre Hartmann's (Compound Sodium Lactate)
 - Catheterised 05:50
 - 06:15 litre CSL
 - 08:45 litre CSL
 - 16:00 litre CSL
 - 18:00 litre CSL
- Catheter emptied 20:05 200mls

■

What was her fluid balance just based on her IV input and her urine output ??

- 5000mls in
- 200mls out
- Positive Balance of **4800mls**

No fluid balance chart !!!

Example

- Patient B
- P0
- Admitted with Sepsis proceeded to NBFD 06:06
- EBL 300ml
- 02:30 litre CSL 4 hours
- 09:30 litre CSL 4 hours
- 11:30 litre CSL 2hours
- 15:10 litre CSL STAT BP 82/42
- 16:00 litre CSL 4 hours
- No Time 1 litre CSL
- 02:25 litre CSL 8 hours

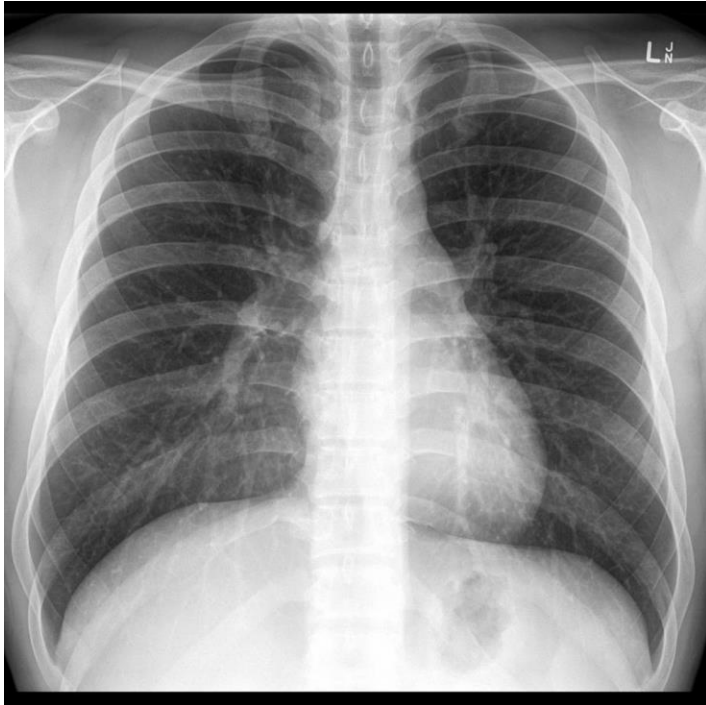
Example

- Seen by Outreach three times they queried with the medical and midwifery staff the amount of fluid given
- The midwives were advised to administer the fluids but at no point did they challenge this management despite the lady being in a positive balance of **4990ml**
- The lady's observations altered at a positive balance of **5345ml** when her respiratory rate was 22

Fluid balance chart completed but no one challenged the management

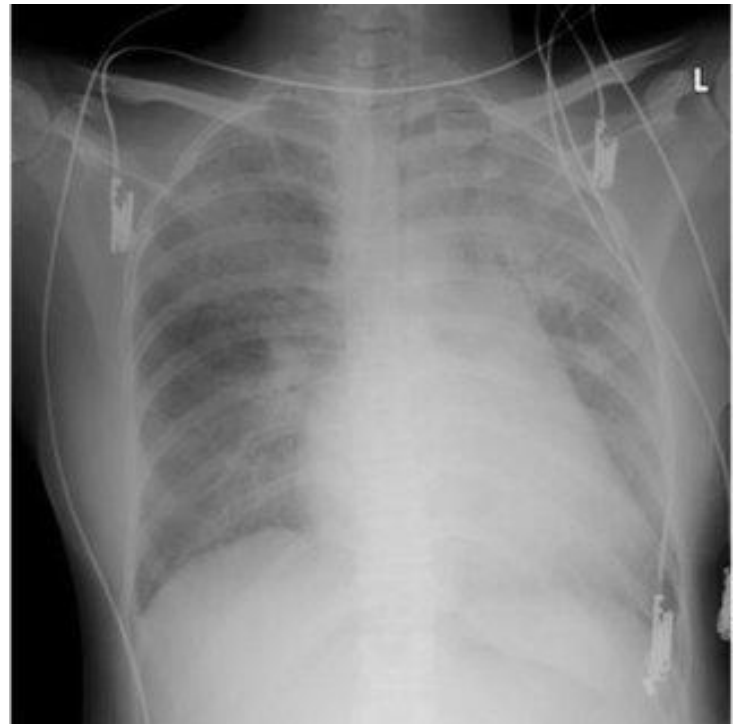
Signs and symptoms of fluids overload

- Peripheral oedema
- Tachypnoea
- Orthopnoea
- Inappropriate weight gain
- Paroxysmal nocturnal dyspnoea
- Pink frothy sputum
- End expiratory crackles on auscultation
- Hypoxia and radiological signs of pulmonary oedema on chest xray



Normal Chest x ray

Pulmonary Oedema



Pulmonary Oedema

The incidence in pregnancy is approximately 0.08%

Or

1:1250 women

HypoNatraemia

- This is due to excessive fluid intake which can lead to water intoxication and this can be fatal
- It usually occurs when excessive amounts of water are drunk in a short space of time
- Case History
- A woman who was low risk drank 9 litres via camel pack
- She subsequently appeared to fit and collapsed.
- Her blood results identified hyponatraemia

UKOSS

We are now requested to report to UKOSS ANY PERIPARTUM Hyponatraemia

- This is to know what the current incidence is
- What the risk factor are for development of this
- How is it managed
- What are the outcomes for the mother and baby

Case definition

- Any woman with symptomatic hyponatraemia (Na <125mmol/l) in labour or in the immediate 48 hours following delivery (not caused by sepsis or pre-eclampsia) where other likely causes have been clinically excluded.

Fluid Balance – Fluid Underload

- Pre eclampsia reduction in plasma volume
- Volume loss – Hyperemesis
 - Haemorrhage
- D& V
- Severe hypovolaemia or hypovolaemic shock causes reduced organ perfusion

Signs and symptoms of fluid underload

- Tachycardia
- Nausea vomiting
- Light-headedness
- Dry skin and mouth
- Cold peripheries
- Poor skin turgor
- Dark concentrated urine
- Oliguria
- Hypotension

Principles of Management

OVERLOAD

- Check ABCDE
- Look for cause
- Give O2
- Check Urine output
- Bloods
- Chest X Ray
- Restrict fluids
- Consider invasive monitoring
- Diuretics unless preeclamptic

UNDERLOAD

- ABCDE
- Look for cause of underload
- O2
- Replace circulating fluid volume
- Check Urine output
- If bleeding give blood ASAP
- Bloods
- Consider invasive monitoring

Case history MBRACE 2018

A woman with a BMI 21 gave birth rapidly following and APH and hyper stimulation with oxytocin

She bled 4 litres following a third degree tear

She received

10units of red cells

10 units of FFP

2 units of cryoprecipitate

1 unit of platelets

She also had crystalloids but the volumes are unclear

Her fluid balance was poorly recorded and unclear

She developed pulmonary oedema , requiring CPAP with a 2 day stay in ITU

MBRACE

Saving Lives-Improving Mothers Care 2018

- Documentation of fluid balance is part of the protocol for monitoring and investigation in major PPH
- Care must be taken to avoid over replacement as well as under-replacement .



ANY QUESTIONS

