Too much salt?

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History

Michael, 3m boy presented on 23rd of July with 1 day history of:

- Abdominal distension, bilious vomiting (x2), poor feeding
- AXR: dilated bowels loops

- Weight 3.26kg (3.38 on 13/7/18)
- Na 135, K 5.1, Ur 7.2, Cr 32, Hb 104, Hct 0.31
- Gas Ph 7.46, Bic 26.3, lact 1.2, glu 6

BG

- ex 34/40
- BWt 2020 gms
- Trisomy 21
- DORV /VSD /pulmonary stenosis
- Duodenal atresia repaired on day 3
- Discharged at 6 weeks
  - fully feeding
  - spirolonactone and frusemide

Acute Menagment

- NGT, replacement of loss with 0.9% NaCl
- IV maintenance fluids (0.9%NaCl+5%dex)
- 2x Bolus (0.9% NaCl)
- Referred to Cardiff for bowel obstruction
- Diuretics stopped pre transfer
- OT on 25th in UHW
  - laparotomy and adhesiolysis
  - resection of terminal ileal stricture with primary end to end anastomosis

Fluids received

- Pre op (preceding 36 hrs) he received
  - 602 ml 0.9% NaCl
  - 62ml 0.45% NaCl
- =96 mmol Na over 36 hrs
- =64 mmol Na in 24hrs
- =19.6 mmol Na/kg/day

Date July	Na	K	U	Creat	Wt	Na intake mmol/kg/ day	Urine Na mmol/l
23 rd presentation	**135**	5.1	7.2	32	3.26		
24th Pre op	**154**	5.8	6.5	46		**19.6**	
25th Post op	**157**	3.9	4.5	40	3.22	**9.2**	
27th	**157**	5.5	5.4	40	3.28	**6.7**	**234**
28th	**145**	6.0	2.8	37	3.30		**156**

Fluid issues

- NG losses
  - 23 July 281 ml replaced with 0.9% NaCl
- Urine output
  - 23July 0.7ml/kg/hr
  - 24/25 July >2 ml/kg/hr

0.9% Saline + 5% Dextrose

- Contains 154 mmol of Na in 1000 ml
- Up to 10 kg child will receive Na
  - @ 150 ml/kg/day – 23.1 mmol/kg/day
  - @ 100 ml/kg/day – 15.4 mmol/kg/day
- 20 kg child will receive Na
  - on IV maint for 24h 11.5 mmol/kg/day
- 30 kg child will receive Na
  - on IV maint for 24h 8.7 mmol/kg/day
- Standard requirement =3 mmol/kg/day

NICE GUIDELINES

- Maintenance- initial isotonic fluid containing Na131–154 mmol/litre
- Measure U& E after 24 hours
- If hypernatremia –
  - No dehydration consider 0.45% Nacl +Glu
  - If dehydration – replace water deficit over 48 h with 0.9 % Nacl.
  - If uncertain measure Urine Na/osm
  - If hypernatraemia worsens or is unchanged after replacing the deficit-- 0.45% sodium chloride with glucose).

Ref- https://www.nice.org.uk/guidance/ng29/chapter/Recommendations#routine-maintenance-2

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- Did the excess Na in fluids lead to his hypernatraemia?
- Should 0.9% NaCl always be used or have we simply sacrificed hyponatreamia for hypernatremia?

- Your thoughts please!