Fluid and Electrolyte Management of ELBW Infants

- **Goal of treatment** is to allow the appropriate postnatal changes to occur without detrimental perturbations in fluid and electrolyte status.

- **Hyponatraemia**
  - Defn: Serum Na⁺ < 135 mmol/L
  - Generally Na⁺ ≤ 130mmol/L should be treated

- **Hypernatraemia**
  - Defn: Serum Na⁺ > 145 mmol/L
  - Generally, Na⁺ ≥ 150mmol/L should be treated

- Adequate urine output ≥1ml/kg/hr

- Pertains to infants born <27 wks gestation (23-26+6 wks) during the first few days of life

- Preterm infants should lose approx 2-3% of their birth weight daily to a maximum of 10-12% over the first 5 days provided their urine output and serum sodium (Na+) remain adequate.

  - On admission to NICU, place in humidified incubator

  - Commence an intravenous parenteral nutrition (PN) solution (which is sodium and potassium free) initially

  - To maintain patency of arterial lines, infuse Glucose 5% (D5) via UAC or 0.45% NaCl via peripheral arterial line. Do not give Glucose 10% via an arterial line

  - Start total fluids of 60 mls/kg/day excluding medications but including all infusions

  - Infants should receive a minimum of 4-6 mg/kg/min of Glucose (Glucose 10% at 60 mls/kg/day provides 4.2 mg/kg/min of Glucose)

  - Monitor fluid balance carefully. Infants should be weighed and their fluid requirements should be reviewed twice a day for first 3-5 days of life.

  - Monitor electrolytes 12 hry for first few days of life. However, beware of excessive blood sampling. Monitoring trends on blood gas samples may avoid the need for repeated serum samples

  - Avoid heel prick blood samples on these infants as their skin is fragile and they are at high risk of infection. If deemed necessary, discuss with senior medical staff.

  - If the serum Na⁺ remains normal, aim not to prescribe any added Na⁺ until there has been a weight loss of approximately 5-6% (usually achieved by D3-5)

  - Commence Na⁺ at a dose of 1-2 mmol/kg per day if serum Na⁺ is < 135 mmol/L with weight loss; or if serum Na⁺ is ≤ 130mmol/L without a change in weight or with weight gain

  - Advance “Total Fluids Allowance” in slow increments (e.g. 10mls/kg/day). Greater increases should be dictated by weight loss, serum Na⁺ and urine output

  - Commencing phototherapy is not an automatic reason to increase fluids. Increase in fluids to be guided by weight loss, serum Na⁺ and urine output.

- **Total Body Na⁺**
  - Weight (kg) x Serum Na⁺ mmol/L x 0.6 (volume of distribution of Na⁺)

- **Predicted Na⁺**
  - (Original weight x Original serum Na⁺ x 0.6) x (Current weight x 0.6)

- **Calculating Na⁺ Deficit**
  - (Serum Na⁺ desired - current Na⁺) x current weight x 0.6

- **Examples**
  - **Serum Na⁺ desired:** 135 mmol/L
  - **Current serum Na⁺:** 129mmol/L
  - **Current Weight:** 750g
  - **Na⁺ Deficit**
    - (135-129) x 0.75Kg x 0.6 = 2.7 mmol of Na⁺ required
  - **Original weight:** 750g.
  - **Original serum Na⁺:** 135mmol/L
  - **Current Weight:** 800g
  - **Predicted Na⁺**
    - (0.75Kg x 135 x 0.6) ÷ (0.8Kg x 0.6) = 126mmol/L

Paediatrics and Neonatology Clinical Programme Algorithms
**References:**


This care pathway has been produced by the National Paediatric and Neonatology Clinical Programme. It is aimed at medical, nursing and allied health professionals working in Irish neonatal units.

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