Critical Care Nutrition Consultancy
CriticalPoint

Patterns of dehydration

Dehydration type	Cause	Biochemical pattern	Management
Isotonic	Balanced loss of water and sodium through diarrhoea	Dehydrated patient with: • Normal to marginally low serum Na (130-145mmol/l) • Normal serum osmolarity (275-295 mOsm/l)	Appropriate oral fluids are isotonic, with balanced sodium: sugar ratio. Appropriate IV fluids are Ringer's Lactate, normal saline + KCl, Half Darrow's, half normal saline + 10% glucose + KCl, 5% dextrose in saline
Hypertonic	Excess loss of free water with retention of sodium in plasma. Usually results from the use of hypertonic, poorly absorbed fluids during diarrhoea.	Dehydrated patient with: • High serum Na (>150mmol/l) • High serum osmolarity (>295 mOsm/l)	For severe dehydration with impending shock, start with IV Ringer's lactate or normal saline. Thereafter SLOWLY correct sodium over 24 hours using a progression of IV 5% dextrose in normal saline, half normal salinethen switch to 5% dextrose. Oral fluids: low sodium WHO ORS solution, then free water.
Hypotonic	Excess loss of sodium. Usually results from intake of free water orally, or inappropriate (sodium poor) rehydration fluids (e.g. plain IV dextrose)	Dehydrated patient with: • Low serum Na (<130mmol/l) • Low serum osmolarity (<275 mOsm/l)	Oral options: WHO cholera solution (**not** ordinary ORS) Appropriate IV fluids are Ringer's lactate, normal saline, 5% dextrose in normal saline. Add IV hypertonic saline to adjust total sodium content to restore calculated sodium deficit SLOWLY over 24 hours.
Base-deficit or hyperchloraemic	Large amounts of bicarbonate lost in diarrhoea, especially through upper GIT stoma/fistula. In dehydrated/hypovolaemic patients, poor renal	Dehydrated, acidotic patient with: • Low serum bicarb (may be <10mmol/l) • Low pH (may be <7.10) • High serum chloride • Normal anion gap	IV balanced salt solution or half normal saline. IV sodium bicarb may be given to correct calculated base deficit at **no more than** 2 amps per litre of half normal saline, or 3 amps per litre of 5% dextrose,

	perfusion means that renal reclamation of bicarb cannot compensate for GIT losses. As patient progresses to shock, poor tissue perfusion worsens acidosis through lactate production.	• Kussmaul's breathing may be present	due to the risk of hypernatraemia and hyperosmolarity. Due to K+/H+ exchange mechanisms, acidosis must be corrected together with the administration of IV K+ in order to avoid rebound hypokalaemia.
Potassium depletion	Excessive lower GIT losses. Hypokalaemia is worse in malnourished patients due to underlying deficit. In acidotic patients, hypokalaemia may be masked, due to K+/H+ exchange mechanisms.	Dehydrated patient with: • Low serum K (<3.5mmol/l)	Correct according to usual protocols. Ensure IV fluids contain potassium or add IV KCl to IV fluids.

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