you don't call each other names, don't rake up old scores or arguments, don't zero in on vulnerable areas, don't play psychiatrist or drag in the rest of the family, don't shout threats, and don't use the silent treatment because this ends effective communication. Physical violence, however, can never be condoned, he says.

Finally, shades of Mr Hawkins Mumrath of Her Majesty's Bengal Civil Service, CBS News reports that ailing Mr Charlie Weldner recently woke up to find that he was dead, that his

social security payments had been cut off, that his wife and children were now receiving death benefits instead, and that since he was dead the government refused to pay for his doctors' and hospital bills. His lawyer (identified in the transcript as Yacavangelo [?]) and affectionately shortened to Yac) has had a difficult time proving that a fail-safe computer could make mistakes—which shows that the more things change the more they have remained the same since Kipling wrote about a similar incident some 80 years ago.

Lesson of the Week

Unrecognised dehydration during parenteral nutrition

R W G PRESCOTT, J C STODDART

Parenteral nutrition is now widely used and, although relatively safe, it has many potential hazards, some of which are not obvious.^{1 2} We report on three patients who showed a rise in serum sodium concentration and osmolality during parenteral nutrition that was not immediately explained.

Patients, method, and results

Three seriously ill men were in the intensive therapy unit. The first patient, aged 61, presented with acute anterior myocardial infarction, right-sided pneumothorax, tuberculous pneumonia, and undiagnosed diabetes mellitus. The second patient had peritonitis due to perforation of the caecum and aspiration pneumonia. No cause was found for the perforation either at operation or at necropsy. The third patient, aged 71, presented with haematemesis and bronchopneumonia that at operation were found to be caused by oesophagitis arising from a hiatus hernia. He also had a diverticular abscess, and he required gastroenterostomy, sigmoid colectomy, and colostomy.

Because of the duration of illness all three patients required nutritional support. None tolerated nasogastric feeding. Intravenous feeding was started by using a commercially prepared combination of 40% dextrose with electrolyte solution (Glucoplex) and a 10% amino-acid solution (Synthamin). One litre of each solution was infused concurrently for 16 hours. Other

Prepared solutions given for parenteral nutrition may cause hypernatraemia owing to inadequate water intake.

fluids were given as indicated by daily assessment during the remaining eight hours. The first patient also required intravenous insulin when dextrose was being infused.

The table shows the cumulative fluid and sodium balances over five days, the volume of Glucoplex given (always with the same volume of Synthamin), and serum sodium concentration and plasma osmolality on the first and fifth days of treatment. To estimate the values for osmolality the formula $2(\text{Na}) + 2(\text{K}) + \text{serum glucose} + \text{plasma urea}$ was used.

Discussion

Flear³ has stated that using hyperosmolar solutions does not lead to an appreciable change in plasma osmolality, and in general this has been our experience. This is most probably due to inadequate water replacement so that, as usually is the case, the hypernatraemia implied that the patients were dehydrated. Glucoplex has a fractional water content of 0.764 g/ml of solution and an osmolality of 3125 mmol/kg (3125 mosmol/kg) water (the corresponding values for Synthamin are 0.898 and 1204). The fluid balance shown in the table was measured over five days. The corrected fluid balances take account of the fractional water content of the solutions used. Considerably less water was given than was thought and, taking insensible losses into account, the fluid replacement was inadequate.

It is not widely known that as little as three-quarters of a given volume of some solutions used in parenteral nutrition is available as water and that an adequate amount of solute-free water must be given with them.

Cumulative fluid and sodium balances, Glucoplex volume, serum sodium concentration, and plasma osmolality in three patients over five days

Case No	Fluid balance* (ml)	Corrected fluid balance* (ml)	Sodium balance* (mmol)	Volume of Glucoplex* (ml)	Serum sodium (mmol/l)		Plasma osmolality (mmol/kg H ₂ O)	
					Day 1	Day 5	Day 1	Day 5
1	+3120	+1854	-374	4000	133	150	318	347
2	+1050	-306	+596	4000	146	158	323†	366†
3	+1550	+553	-200	3000	140	156	316†	367

*Cumulative results over five days.

†Estimated value.

Conversion: SI to traditional units—Plasma osmolality: 1 mmol/kg = 1 mosmol/kg.

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