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Please read this bit first

The HPCSA and the Med Tech Society have confirmed that this clinical case study, plus your routine review of your EQA reports from Thistle QA, should be documented as a "Journal Club" activity. This means that you must record those attending for CEU purposes. Thistle will **not** issue a certificate to cover these activities, nor send out "correct" answers to the CEU questions at the end of this case study.

The Thistle QA CEU No is: **MT00025.**

Each attendee should claim **THREE** CEU points for completing this Quality Control Journal Club exercise, and retain a copy of the relevant Thistle QA Participation Certificate as proof of registration on a Thistle QA EQA.

October 2006

Diarrhoea

Case Study:

A 57-year-old woman presented with severe diarrhea of four days duration. She was mildly dehydrated and was treated with IV infusions of one-fifth 'normal' saline in 4% dextrose supplemented with potassium (6g of KCl daily). She received no bicarbonate supplements.

Plasma	Admn	Day 1	Day 2	Day 3	Units	Ref. range
Na	136	138	136	139	mmol/L	(132-144)
K	1.8	3.4	3.2	4.5	mmol/L	(3.2-4.8)
Cl	108	113	109	111	mmol/L	(98-108)
HCO_3	16	18	20	23	mmol/L	(23-33)
Creat	140	90	80	60	þmol/L	(60-120)
Ca	2.37	2.23	-	-	mmol/L	(2.15-2.55)
PO_4	0.82	0.33	0.38	-	mmol/L	(0.70-1.25)
Mg	-	0.37	-	-	mmol/L	(0.75-1.00)
Alb	37	35	-	-	g/L	(30-50)

Comment:

This patient showed the classical biochemical features of severe diarrhea, namely,

- dehydration
- hypokalaemia – losses in diarrhoeal fluid and in urine (secondary hyperaldosteronism, magnesium depletion)
- normal anion gap metabolic acidosis-loss of bicarbonate in diarrhoeal fluid
- hypomagnesaemia-loss of magnesium in diarrhoeal fluid
- hypophosphataemia after commencement of IV glucose

Two other important observations are:

- the severe hypokalaemia that can be associated with diarrhea
- the slow resolution of the metabolic acidosis (normalization of the plasma {HCO_3}) when no bicarbonate supplement is given

Management of diarrhoea:

The most important therapeutic procedure is the correction of any water, sodium, potassium, and acid-base imbalances.

Patients who have severe diarrhea will be deficient in water, sodium, potassium, and bicarbonate; and often require an intravenous infusion of saline supplemented with potassium. Two important points to bear in mind are:

1) The metabolic acidosis is due to bicarbonate loss and the only way the patient can replace the deficiency is to generate it by the kidney. This may take several days and if the patient's plasma bicarbonate level is very low (e.g. <12 mmol/L) he will usually require parenteral bicarbonate administration.

2) Potassium repletion should be started before giving bicarbonate therapy-lessening of the acidaemia (and possible development of alkalaemia) by the bicarbonate infusion forces potassium back into cells, and severe hypokalemia may occur if potassium is not given before the bicarbonate.

CPD QUESTIONS

1. What are the most likely causes of severe diarrhoea?
2. Discuss the issue of hypolalaemia with regard to metabolic problems if it is not corrected?
3. Consider the Admission results. - How you observed such results in your own laboratory?
   If so, follow the patient's subsegment result history and review.