agMOOCs

Unit : Fluid therapy in cattle
Lesson : 4

Acid– base imbalances and rehydration management – Part II

Dr. G. Vijayakumar, M.V.Sc., Ph.D., PGDECM

Professor
Veterinary University Peripheral Hospital
Madhavaram Milk Colony
Chennai-600 051
Tamil Nadu Veterinary and Animal Sciences University

Rumen lactacidosis

Etiology

➤ Sudden ingestion of rapidly fermentable toxic doses of carbohydrate rich feed

➤ **mmol of HCo_3 required**

= 0.3 x body weight x base deficit

Rumen lactacidosis

➤ mmol of HCO_3

$$= 0.3 \times \text{body weight} \times \text{base deficit}$$

Rough thumb rule

Mild

Moderate

Severe

Example

Calculate bicarbonate needed for a cattle weighing 100 kg

HCo_3 requirement
    =   body wt x 0.3 x base deficit
    =   100 kg   x 0.3 x (- 10 mmol)
    =   - 300 mmol

Availability

▶▶ 5%   10 ml ampoules

▶▶ 7.5% 10 ml ampoules or 25 ml ampoules

▶▶ How to get mmol from gm ????

Each ml of 7.5 %   =   0.89 mmol of bicarb

So for 0.89 mmol we need 1 ml of 7.5 % solution

For 300 mmol we need = $\dfrac{300 \ \text{x} \ 1}{0.89}$ = 337 ml

Thus 337 ml of 7.5 % NaHCO3 will provide
300 mmol of bicarbonate

Each ml of 5%   =   0.6 mmol of bicarb

So for 0.6 mmol we need 1 ml of 5.0 % solution

For 300 mmol we need = $\dfrac{300 \ \times 1}{0.06}$ = 500 ml

Thus 500 ml of 5.0 % NaHCO3 will provide
300 mmol of bicarbonate

Example

Calculate bicarbonate needed for a goat weighing 10 kg

HCo3 requirement

= body wt x 0.6 x base deficit

= 10 kg x 0.6 x (- 10 mmol)

= - 60 mmol

HCo$_3$ requirement is – 60 mmol

For 0.89 mmol we need 1 ml of 7.5 % solution

For 60 mmol we need = $\dfrac{60 \times 1}{0.89}$ = 67.4 ml

For 0.6 mmol we need 1 ml of 5.0 % solution

For 60 mmol we need = $\dfrac{60 \times 1}{0.6}$ = 100 ml

HCo$_3$ requirement is – 60 mmol

7.5 % solution

we need 67.4 ml

5.0 % solution

we need 100 ml

If it is to be given using LRS ?????

500 ml will supply 25 mmol of bicarbonate

= 1ml will supply 0.05 mmol of bicarbonate

For 0.05 mmol we need 1 ml of LRS for 60 mmol we need

= 60 x 1/0.05

= 1200 ml

= 1.2 litres

For 10 kg GOAT ……………..????????????

Cow weighs …………………….250 to 450 kg

Example

Case A: 100 kg cattle with lactacidosis

      For 300 mmol we need = 337 ml of 7.5 % NaHCO3

Case B: 10 kg goat with lactacidosis

      For 60 mmol we need   = 67.4 ml of 7.5 % NaHCO3

Case B dies while Case A do not
Why????????

Take home points

Should not exceed : 2mmol/kg/min

Case A: 2 mmol x 100 kg = 200 mmol

        appro   = 200 ml /min

Case B: 2 mmol x 20 kg   = 40 mmol

        approx   = 40 ml / min

Rate of administration

Case A: 100 kg cattle with lactacidosis

$\qquad$ = 337 ml of 7.5 % NaHCO3

Case B: 10 kg goat with lactacidosis

$\qquad$ = 67.4 ml of 7.5 % NaHCO3

Case A: 200 ml /min
Case B: 40 ml / min

Rate of administration

▶▶ An 8.4% sodium bicarbonate
   not faster than
   1 ml/kg BW/ minute

Thank you