

Clinical pathology diagnostic challenge : case #23

Signalment: 2 month old Holstein calf.

History: dyspnea, cough, diarrhea.

Physical exam observations: increased cranio-ventral thoracic respiratory sounds, hyperthermia.

CBC results

Hematocrit (0.24-0.46 L/L)	0.34
Hemoglobin (80-150 g/L)	112
Erythrocytes ($5.0-10.0 \times 10^{12}$ /L)	9.66
MCV (40-60 fL)	35
MCHC (300-360 g/L)	329
Reticulocytes (<1%)	-
Reticulocytes ($<60\,000 \times 10^6$ /L)	-
Platelets ($100-800 \times 10^9$ /L)	719
Plasma protein (60-80 g/L)	76
Fibrinogen (<8 g/L)	5
Leukocytes ($4.0-12.0 \times 10^9$ /L)	29.4
Neutrophils (mature) ($0.6-4.0 \times 10^9$ /L)	17.6
Neutrophils (band) ($0-0.1 \times 10^9$ /L)	0
Lymphocytes ($2.5-7.5 \times 10^9$ /L)	11.5
Monocytes ($<0.8 \times 10^9$ /L)	0.3
Eosinophils ($<2.4 \times 10^9$ /L)	0
Basophils (0 - rare $\times 10^9$ /L)	0

Clinical chemistry results

Glucose (2.6-4.9 mmol/L)	7.6
BUN (1.61-6.51 mmol/L)	2
Creatinine (54-132 μ mol/L)	59
Bilirubin (<14 μ mol/L)	10.10
GGT (9.5-39 U/L)	28
Alkaline phosphatase (<100 U/L)	144
AST (30-104 U/L)	115
CK (<310 U/L)	127
Total protein (59.5-80.0 g/L)	68.7
Albumin (27.7-40.4 g/L)	23.72
Globulins (26.2-45.2 g/L)	44.98
Calcium (2.22-2.70 mmol/L)	2.27
Phosphorus (1.05-2.83 mmol/L)	1.36
Potassium (3.86-5.28 mmol/L)	3.83
Sodium (134-147 mmol/L)	136.6
Chloride (96-109 mmol/L)	97.7
Total CO ₂ (22-33 mmol/L)	29.8
Anion Gap (7-18 mmol/L)	12.93
Magnesium (0.7-0.91 mmol/L)	0.7

Other tests

Tracheal wash cytology

Appearance	opaque red with white flocculent material
Nucleated cells	34.1×10^9 /L

Using the laboratory changes, submit a differential diagnosis and justify it (pathophysiology). If needed list other possible tests to confirm your diagnosis.