Equine IM
Case Log # 40
05/28/23
Luca (332769)

**Signalment:**

10 year old Warmblood gelding

**History:**

Luca presented to the hospital for further evaluation of fevers. The patient had been febrile for the past three days, with his highest recorded temperature at 105 F. The rDVM reported that his fevers had been responsive to flunixin meglumine and that the patient had continued to eat and drink normally during his febrile episodes as well as pass manure. He was noted to be depressed and lethargic. Luca had not traveled to any shows recently and no other horses at the barn were showing any signs of illness.

**Patient Presentation:**

On arrival at the hospital, the patient was taken directly to an isolation stall due to his fevers of unknown origin. Due to the potentially infectious nature of the fevers, the patient was not taken to the scale and his weight was estimated to be 525 kg. Luca was bright, alert and responsive in the stall and was noted to pass 1 soft normal manure pile on the trailer. His temperature was 100.5 F, his heart rate was 48 bpm, and his respiratory rate was 16 rpm. His mucous membranes were pink and moist with a capillary refill time of 2 seconds. There were no murmurs or arrhythmias ausculted and he had normal bronchovesicular sounds with no wheezing or coughing. His borborygmi were adequate in all four quadrants. His retropharyngeal lymph nodes were enlarged bilaterally. Luca had a good appetite for alfalfa hay that was offered to him.

**Differential Diagnosis:**

Luca's differential diagnosis was fever of unknown origin with a suspected viral origin.

**Interventions:**

An abdominal ultrasound was performed and revealed increased definition of the colonic walls, but there was no evidence of thickening of the colonic walls. A thoracic ultrasound was performed and showed no abnormalities. Blood was taken from the patient's jugular vein and submitted to the laboratory for a CBC and serum chemistry as well as a serum amyloid A (SAA). The blood results showed a leukopenia at 2.99 x 10^3/uL (reference range: 5.0 - 12.0 x 10^3/uL), lymphopenia at 0.46 x 10^3/uL (reference range: 1.32-5.68 x 10^3/uL), and thrombocytopenia at 21 x 10^3/uL (reference range: 90 - 360 x 10^3/uL). The SAA results were elevated at 1942 mg/L (reference range: 0-20 mg/L). The elevations shown in SAA indicated that there was inflammation present. SAA is a good indicator of inflammation and can be helpful before a diagnosis has been made as it can establish if inflammation is present and guide a treatment plan accordingly. SAA may be a good indication that inflammation is present, however it cannot differentiate between a bacterial or viral infection. The applicant placed a 14 gauge IV catheter in Luca's left jugular vein to facilitate the administration of medication. The applicant took an initial nasal swab of both of the patient's nostrils to be pooled with future samples and submitted for a fever of unknown origin panel.

**Case Management:**

The patient was hospitalized in an isolation stall due to the fevers and the leukopenia. There was concern that the patient could have something infectious considering his high fevers, and due to his leukopenia, Luca was more susceptible to other infectious agents that could be found in the hospital setting. In order to protect the hospitalized patients, as well as Luca, the isolation stall was the best space for him. Luca's treatment plan was as follows:

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- Daily physical exams
- Temperature checks q 4 hr
- Daily nasal swab collection
- Flunixin meglumine 394 mg IV q 8 hr (0.75 mg/kg)
- Dipyrone 11,550 mg IV PRN for fevers (22 mg/kg)
- Omeprazole paste 1250 lb dose (2 g) q 24 hr (4 mg/kg)
- Sucralfate powder 10 g PO q 8 hr (20 mg/kg)
- Ice boots on all four feet
- Feeding: 1 flake of alfalfa hay q 6 hr and 1 lb of pelleted mashes q 4 hr

On the first day of hospitalization, Luca's temperature was 104.9 F at 2pm and he was given a dose of flunixin meglumine. His temperature only decreased to 103 F 3 hours later, but the patient remained bright and was eating well so no further treatment was administered. By 10 pm, his temperature remained 103 F so he was given another dose of flunixin meglumine. At 1 am, his temperature was 103.4 F, and he was given a dose of dipyrone as it was too early to give him more flunixin meglumine. An hour after the dipyrone administration, his fever began to reduce and his temperature was 102.6.

On Luca's second day of hospitalization, his morning physical exam revealed a temperature of 103 F, but he was due for a dose of flunixin meglumine so one was administered. His heart rate was 52 bpm and his respiratory rate was 20 rpm. His borborygmi were adequate in all quadrants and his lungs continued to auscultate normally, with no wheezing or coughing. He continued to pass manure normally and drank 10 L of water overnight. Luca had two more febrile episodes throughout the day, at 2 pm his temperature was 104 F and at 10 pm his

temperature was 104.9 F. Both times he developed fevers he was due for doses of flunixin meglumine which he received and his fevers responded to the NSAID. Luca did not have any breakthrough fevers and did not receive any dipyrone. He continued to have a good appetite for his alfalfa hay, but did not finish his pelleted mashes. He drank 16 L of water throughout the day and continued to remain bright even while he was febrile. The rest of his treatment plan remained the same.

On his third day of hospitalization, his morning physical exam was within normal limits. His front feet were noted to be warm but his digital pulses remained within normal limits. He continued to pass manure normally and continued to drink water. His appetite remained good for his alfalfa hay. His highest recorded temperature was 102.8 which was between flunixin meglumine doses, however the temperature came down on its own without the help of dipyrone. The three days of nasal swab samples were pooled together, along with a blood sample and sent to the laboratory for a fever of unknown origin panel polymerase chain reaction (PCR) test. The rest of his treatment plan remained the same.

On his fourth day of hospitalization, Luca's physical exam was within normal limits and his front feet were no longer warm to the touch. His temperature remained stable all day, with the highest recorded temperature being 99.7 F. The blood smear that was submitted on Luca's first day of hospitalization was read by a clinical pathologist and the results indicated the presence of anaplasma seen on the blood smear. Luca was started on 3,938 mg of oxytetracycline IV q 12 hr (7.5 mg/kg) which was diluted into a 1 L bag of balanced crystalloid fluids and given over 15 minutes. The patient was taken off of isolation protocol due to the presence of anaplasmosis, as anaplasmosis is not contagious. The rest of his treatment plan remained the same.

On his fifth day of hospitalization, his physical exam remained within normal limits, as did his temperature. His ice boots were discontinued and his feet remained cool and his digital pulses were within normal limits. He continued to pass manure normally and drink water. His appetite remained good for his alfalfa hay and for his dry pellets. He continued on his IV oxytetracycline and the rest of his treatment plan remained the same.

**Final Outcome:**

On the sixth day of hospitalization, Luca received one more dose of IV oxytetracycline and then his IV catheter was removed and he was discharged from the hospital. Even though Luca's clinical signs had largely resolved, it was recommended that he remain on antibiotics to ensure he did not have a relapse if the anaplasma wasn't completely resolved. He was sent home with doxycycline 5775 mg PO q 12 hr for 7 days (11 mg/kg). The owners were advised to discontinue the antibiotics and to call the hospital if Luca were to develop diarrhea. The owners were sent home with oral flunixin meglumine to use PRN for any fevers. The owners were instructed to monitor Luca's temperature at least twice daily and to administer a 500 pound dose of flunixin meglumine if his temperature was above 102.5 F. They were also told to monitor Luca's feed and water intake as well as his urine and manure output. Luca was allowed to be returned to his normal stall and to be kept quiet until he was finished with his antibiotic treatment. They were also advised to monitor his IV catheter site for any signs of swelling, heat, or discharge. The results from the fever of unknown origin panel PCR returned and were positive for anaplasma, but no other pathogens were detected.

**Discussion:**

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Anaplasmosis is a rickettsial disease that is spread through the bite of infected ticks. It is caused by the gram-negative coccobacillary organism *Anaplasma phagocytophilum* (Oliver). It is spread through the dermis once the bite occurs. Once a patient is infected, the organism has immunosuppressive effects and the patient is then susceptible to other infections. In horses, the clinical signs appear as fevers, depression, tachycardia and anorexia. As the disease progresses, more signs may appear, such as distal limb edema, stiffness and lameness. Thrombocytopenia is also seen in many patients. To diagnose anaplasmosis, a blood smear can be read where the morulae can be seen within neutrophils. An enzyme-linked immunosorbent assay (ELISA) snap test can also be performed as it is sensitive to the antibodies. Another method of identifying anaplasmosis is PCR testing. PCR testing can be reliable as early as the onset of symptoms. The most common treatment of anaplasmosis is tetracyclines. The most common tetracyclines used are oxytetracycline IV and doxycycline or minocycline PO. It is important to use other methods along with tetracyclines in order to address the clinical signs such as fevers and edema. Luca's clinical signs were fevers, lethargy and depression and he was noted to have a leukopenia and thrombocytopenia on his CBC. Once he was started on supportive care, many of his clinical signs started to resolve and his attitude seemed to improve. Once the oxytetracycline was initiated, his fevers stopped completely and he no longer needed supportive care in a hospital setting.

When it comes to treating fevers, flunixin meglumine tends to be the drug of choice for many clinicians. NSAIDs are typically used to treat inflammation but they also have antipyretic properties. Flunixin meglumine can be used for acute abdominal pain, as postoperative pain management, as an antipyretic and it also has anti-endotoxic properties. In Luca's case, it was

used to help combat his fevers and was given q 8 hr due to the frequency of his fevers. A pattern that was seen with his fevers, were that they would spike right around the time he was due for a dose of flunixin meglumine. One of the negative side effects of NSAID use is the effect that it has on the gastrointestinal tract as it can cause ulceration. Dipyrone is another NSAID that was used in Luca's treatment plan, and one of its benefits is that it has minimal effects on the gastrointestinal tract. It is good medication to use in conjunction with flunixin meglumine as it can help control the breakthrough fevers that occur between flunixin meglumine doses.

References

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