Capture Myopathy

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This condition has many names: exertional, transport, stress, degenerative myopathy and white muscle disease.

There are a lot of myths and misinformation about this condition. The first myth to destroy is that this is a condition seen only in marsupials. It affects all species - and is most widely recognized in hoofed animals such as deer. However, birds - such as long-legged water birds and raptors may also be affected.

All ages and sexes are susceptible - from a joey in a pouch onwards.

HOW DOES IT HAPPEN?

When the muscle is exerted (used) its metabolism changes from aerobic (uses oxygen) to anaerobic (uses stored energy in the muscles). This leads to the build up of lactic acid causes acidosis. Lactic acid in the bloodstream drops the pH in the body, affecting heart output. If the heart does not pump oxygen to the muscle it starts to die. When the muscle dies over the next 7 days, it releases a product called myoglobin (breakdown product of muscle). Myoglobin damages the excretion part of the kidney (the renal tubule). Other organs are affected: the lungs become congested and bleed. The liver becomes swollen and pale.

CLINICAL SIGNS

We need to appreciate that we are seeing a disease in a spectrum of severity, over a number of days. It may occur in any muscle group in front and back legs or heart. It has been classified into four appearances that can help to understand what carers can see:

1. hyperacute - very sudden onset with death often noted.
2. acute - from heart muscle necrosis and occurs over 2- 4 days.
3. subacute - kidney failure from the release of myoglobin.
4. chronic - die over 2-4 weeks due to heart failure and paralysis

The range of clinical signs begin in the early stages as hyperthermia (body temperature is above normal - animal is hot - sweats, pants), trouble breathing, fast heart rate. The animal may become weak or have a stiff gait. Muscle tremors - either involving a few muscles or an entire muscle group may be seen. The animal may collapse and die.

WHAT CAUSES CAPTURE MYOPATHY?

There are several situations that can cause capture myopathy. These include trapping, capture, transport and even simple restraint. In other words - humans cause this condition! However, it is also used successfully as a hunting tool by large carnivores such as dogs.

IS WHITE MUSCLE DISEASE RELATED TO CAPTURE MYOPATHY?

Muscle is a pretty simple organ. All it can do when it is sick is to die! So white muscle disease, which is seen in calves due to a lack of vitamin E and selenium deficiency has the same appearance as myopathy when you slice the muscle and look at it under a microscope.

HOW IS CAPTURE MYOPATHY TREATED?

The bad news is that if you have an animal with clinical signs, its prognosis is poor. In other words - it is not going to get better.

In other words - treatment is not effective and continuing to let the animal suffer becomes a welfare issue.

The muscle has died. It cannot re-grow. This has an implication with the welfare of the animal then being treated, only to suffer horrible cramping, pain from failing kidneys, inability to breathe from congested lungs and then to die up to 1 month later. It also has an implication for release - if the muscles are destroyed - then how is it ever going to be 100% fit for release? Field treatment in the hands of many experienced veterinarians has not been successful. Please remember, that humans are sometimes not saved in similar situations (ecstasy overdose, malignant hyperthermia in susceptible people).

However, in situations where it is recognized at the hyperthermia stage, it is believed to be possible to treat it. Treatment is quite intensive and expensive.

1. The first step is to sedate the animal. *Although from a prevention perspective, this should have already been performed.* Sedation with valium may reduce anxiety and assist in muscle relaxation.
2. The most important treatment for this condition is **intravenous fluids** eg: with Hartmans solution or 0.9% saline. Essentially, what you are treating is acute kidney failure.

   The goal of giving fluids is to:

   - Improve the blood supply to the kidney
   - Dilute the damage that myoglobin does to the kidney
   - Dilute the lactic acid in the blood stream, thus improving heart function
   - Expand the blood volume and address the mechanisms of shock
   - Reverse the hyperthermia
3. Another **muscle relaxant** that is used by zoos is **Dantrolene.** This is used in humans for a similar condition - malignant hyperthermia. The drug is given intravenously within 6 hours of reconstitution. It can damage the liver and kidney. It is a human prescription only drug - few vets stock this.
4. **Cortisone** can be used for its anti-inflammatory properties. It may also help to reverse hyperthermia.
5. **Vitamin E and selenium** can be used. This comes as **Selvite-E.** The dose rate is 1ml per 50 kg. It is given every 7 days under the skin. More frequently will harm the animal. Selenium works in the cell membrane as an antioxidant, and similarly, Vitamin E out of the cell.

PREVENTION

This is the key to this condition as you cannot undo the damage, you want prevent it from occurring in the first instance. The animal's life is in your hands.

The goal is planning: plan the capture, plan to use sedation, plan what to do if something goes wrong.

1. The method of capture needs to be well-planned, with sufficient people-power to quickly trap the animal. And that is the key - we do not chase macropods, we encourage them into a trap. Time spent observing the animal and the escape route it wants to follow, and then coordinating your movements is invaluable.
   - Minimize the pursuit time - ideal is less than 3 minutes! After this, muscle enzymes are beginning to climb and the damage begins.
   - Reduce struggling by covering eyes and placing the captured animal into a bag.
   - Keep the human noise down. No dogs should be present.
   - Reduce the amount of handling time and then release to a less stressful place as soon as possible.
2. Sedation. Consider the use of **valium, azaperone** (**Stresnil** for pigs), or **fluphenazine** (**Modecate** - a human antipsychotic used very successfully in zoos for translocation of animals but takes up to 3 days to start to work).
3. Do not catch up animals when the ambient temperature is over 20°C. Do not leave a sedated animal in direct sunlight.
4. Ensure that you keep the animal's temperature down: good ventilation, damp cloths if required.