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RABBITS AS CRITICAL PATIENTS (INCLUDING RODENTS)

Most important Questions

- What is a critical ill rabbit?
- What will a critical ill rabbit look like?
- What do I do first ?
- How to avoid causing more harm to the animal?
- What will I do after I stabilize the animal?

The critical rabbit:

- What is a critical ill rabbit?
 - Trying to avoid it, is success.
 - Client education is important.
- Basically a critical ill rabbit is present if there was no
 - food or water uptake or no elimination for 24 hours!

Not really critical... spinal fracture

What will a critical ill rabbit look like?

- It often goes unrecognized due to the settle character of the clinical signs.
- As a prey species it is not in the animal's interest to attract attention.
- The 'conservation-withdrawal' reaction overweights the "fight or flight" reaction.

What is happening

- The normal stress response is happening !
- Weekers et al. Neuroendocrine Stress Response in Critically Ill Rabbits Endocrinology, March 2002, 143(3):764-774

Some results and implications:

- Arterial pO₂ and pCO₂, and levels of ionized calcium, sodium and potassium were not significantly different between the two study groups at any of the studied time points
- Blood gases might not be that helpful as in other species!

Hemoglobin levels

- On d 1, Hb level decreased to the same extent in critically ill and control animals and this remained stable until d 3. On d 8, Hb was significantly lower in critically ill animals than in controls.

Hematology changes:

- In rabbits one of the main effects in disease is the reduction of the total blood cellularity, particularly with respect to the red cell values but also to a lesser extent with the white cell counts.
 - Increase rarely
- The hematocrit might be one of the best indicator to differentiate between sick and healthy

Conclusion

- The analysis showed that the least important variable was the basophil count, followed by the monocyte and eosinophil counts.

Any procedure...

- equals stress.
- has the potential to kill the critical ill rabbit.
- reversing or stopping the acute stress process is key to success.

Current advice...

- "A full clinical examination should then be performed or, alternatively, this may be staged if the rabbit is still in a critical condition. Baseline cardiorespiratory parameters should always be established at the start of an examination..."
- A few equipment items can make rabbit urgent care procedures more efficient....
- A stainless steel nasal speculum provides a rapid but limited dental examination....

In my opinion: The result will be...

My opinion is very different:

- It is not very important to figure out the exact cause of the presentation.
- Stopping the downward spiral is most important.
- Most often, non-specific therapy like aggressive fluid therapy with adequate pain management is most important.
- Once the initial crisis is under control, the investigation of the problem can start.

What do I do first ?

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Sedation is key

- We have to stop the downward spiral with drugs.
- Benzodiazepines are excellent drugs as they are:
 - safe
 - fast acting
 - anxiolytic

Dosages

- Please look up dosages in textbooks and publications.
- Do not practice exotic animal medicine without a good reference book for drugs.

The sedated rabbit

What are they doing in human medicine?

How to avoid causing more harm to the animal?

- Know the anatomy and the physiology.
- Pharmacology
- Basically a trip back to veterinary school, year 1-3!

Anatomy of the ear pinna

- The blood supply is often over simplified.
- A central ear artery and 2 lateral/marginal ear veins.
- In reality the blood supply is more complex.

Atlas D'Anatomie Du Lapin

Phlebotomy

- ear vein
 - not artery
- compress vein after procedure

The fear....

- Ear necrosis or sloughing is usually sequel to drugs injected into the ear.
- This is not a phenomenon limited to rabbits.

lat. saphenous

What will I do after I stabilize the animal?

- While animal was sedated, you took/did:
 - blood
 - radiographs

- placed i.v. catheter
- palpated abdomen
- checked teeth
- cystocentesis.....

Procedures

- Now we can do the procedures.
- The animal will be relaxed and non-fearful.

Once the animal is recovered

- Stabilization starts, which includes:
 - fluids
 - pain medication
 - heat support
 - ...

Pizza anyone?

A word about force feeding

- In my opinion, force feeding is usually overdone.
- The animal refuses to eat if there is pain, nausea, bloat or other feelings of discomfort.
- Try to determine why the animal is not eating and correct this problem first.

Do not over feed....

- Rabbits have been suspected to act like cats to stress and hypoglycemia is not often seen.
- Do not make something worse!
- Less is often more!

THE BLOOD GLUCOSE DISCUSSION

- The rabbit has been linked anecdotally to hyperglycemia due to stress, similar to the cat.

- What evidence is available?

Interesting paper:

Interesting peer review papers

- Severe hyperglycemia (>20 mmol/l, 360 mg/dL) was associated with conditions with a poor prognosis.

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- Rabbits with confirmed intestinal obstruction had a mean blood glucose of 24.7 mmol/l (445 mg/dL)
- rabbits with confirmed gut stasis, which had a mean value of 8.5 mmol/l (153.15 mg/dL).

Additional findings:

- The blood glucose results from clinically healthy rabbits had a mean value of 8.38 +/- (2.69) mmol/l, (150 +/- 50 mg/dL) which is above the published reference range.
- Stress from handling could account for the high results. Transient, stress induced hyperglycemia is well recognized in other species.

But:

- What really is the effect of this stress?
- Every time we handle an animal, we should assume that this might have some impact on the stress level or baseline.

Ideally,

- we would like to see the extend of and the longitudinal behavior of the blood glucose at any given time.
- we could see how activities, like stress, exercise, rest and food uptake influence the blood glucose level.

How can we do that?

First Painful event

Pain or stress?

Pet Bunny

Temperature as index:

- Hypothermic rabbits at admission had a risk of mortality three times greater than rabbits without hypothermia
- For each 1°C lower in admission rectal temperature, the odds of death were doubled
- In conclusion, hypothermia at admission is a prognostic predictor in hospitalized pet rabbits. Due to its association with mortality in both healthy and diseased pet rabbits, rectal temperature should be always measured during the physical examination.

Hyperthermia is rare

- Even if animals are septic.

- A rise in body temperature is usually moderate when compared to humans or other animals.
- Do not take an absence of hypothermia as an absence of sepsis

A word about intubation

- Although it was not significantly different ($P = 0.28$), 71.4% (5/7) of rabbits provided ventilation by facemask experienced ROSC versus 33% (2/6) ventilated by other means (e.g., intubation, tracheostomy).
- Seven (47%) of 15 rabbits in this study were not intubated, rather ventilation was provided by means of a tight-fitting facemask attached to an ambu bag or anesthesia machine. ROSC was achieved in 71.4% of the rabbits not intubated, suggesting that this is a useful, easy, and effective method for providing ventilation when performing CPR to a rabbit patient and may negate the need for emergent intubation in many cases.
- Based on our findings, it is the opinion of the authors that for those inexperienced with rapidly intubating rabbits, valuable time need not be wasted trying to intubate during CPR; providing respiratory support by facemask appears to be efficacious in aiding ROSC

In Humans:

- The recommendation for using bag-mask ventilation is also supported by the AHA guidelines for providing BLS in adult humans.
- One of the potential advantages of facemask ventilation is that it will likely reduce the delay in starting chest compressions, and thereby minimize subsequent interruptions to chest compressions that may be required to facilitate endotracheal intubation.

Summary

- The provision of respiratory support by tight-fitting facemask is a reasonable approach when performing CPR to a rabbit patient, especially if the caregiver is not highly experienced with intubating rabbits

Take home message

- In order to assess the habit very quickly and effectively you should use the following parameters:
 - PCV
 - GLU
 - TEMP