Virtual Veterinary Specialists

Essential Clinical Guides Series

"How to Manage Canine Immune Mediated Haemolytic Anaemia Cases under COVID-19 Restrictions"

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Case Presentation

- Dogs with Immune Mediated Haemolytic Anaemia (IMHA) often present with a history of lethargy and reduced appetite.
- In severe cases, animals may present collapsed.

Diagnostics

- If IMHA is suspected, then **haematology and a blood smear** should be your first task.
    - If IMHA is present you would expect see a severe regenerative anaemia with spherocytes present.
- Your second task should be a **slide agglutination** test. This simple test can be performed in house:
    - Place 1 drop of EDTA blood onto a slide
    - Place 2 drops of saline onto the slide
    - Swirl gently and look for signs of agglutination
        - Look for **macroscopic** agglutination -if present you will visually be able to see the red blood cells clumping together. If macroscopic agglutination is present, there is no need to submit a Coombes test. If macroscopic agglutination is not present then assessing microscopic agglutination or submitting a Coombes test is advised, to assist with a definitive diagnosis.
        - Look for **microscopic a**gglutination (see image in Appendix 1).
- IMHA can be primary or secondary and once the patient is stable, diagnostics (thoracic and abdominal imaging) should be performed to determine between the two.

Treatment

- Many dogs with IMHA will be severely affected and may need a blood transfusion.
- This can feel daunting if you have not performed this procedure before, but the guidelines below will take you through the process.
- There is no specific PCV at which a transfusion should be performed - it will depend on the individual case.
- Cases which are haemodynamically unstable (with tachycardia and poor pulses) should be considered for a transfusion.
- If you have diagnosed a case with IMHA then it would be worth ordering a bag of packed red blood cells from the Pet Blood Bank, if you do not already have some in the practice (see below re. blood typing and cross matching requirements).

Performing a Blood Transfusion

- Explain the risks involved to the client (anaphylaxis, volume overload, sepsis) and obtain informed consent to proceed.
- The are 2 matching processes which can be done prior to a transfusion:
    - 1) **blood typing**, (dogs, like humans, have different blood groups. The main antigenic blood group is DEA 1.1 and dogs are classed as being DEA 1.1 positive and DEA 1.1 negative). Donor and recipient blood should be the same group.
    - 2) **cross matching**, a test where donor and recipient blood are mixed to look for potential reactions. This is only essential if the recipient has had a blood transfusion more than 3-5 days before.
- In an ideal world blood typing is done prior to *any* transfusion, however we appreciate this is not always possible so the following may help in deciding how to manage a case:

Patient's first transfusion or less than 3-5 days since their first transfusion:

- Be sure to double check with the owner if the dog has ever had a transfusion.
- In these cases, a transfusion can be given without blood typing or cross matching (because the patient shouldn't have antibodies against foreign blood).

- If you plan to give an unmatched transfusion, send blood from the patient for typing **before** giving the unmatched donor blood. Then if another transfusion is needed, you will know the blood type and can match.

Patient has had a previous transfusion, more than 5 days ago:

- You must blood type the patient and administer typed blood.
- You must also perform a cross match prior to the transfusion, (because the dog may have developed antibodies against foreign blood types).
- The Pet Blood Bank can arrange cross matching with an external lab so multiple units can be cross matched for your patient.
- If in-house cross matching is performed, the following link provides detailed instructions on how to perform and interpret results. https://www.petbloodbankuk.org/media/1493/step-by-step-guide-to-manual-cross-matching.pdf

For all Transfusions:

- In IMHA, the patient only needs red blood cells and not the plasma component. Giving just red blood cells reduces the risk of volume overloading the patient.
- Pet Blood Bank will provide red blood cells and this can be dispatched as urgent within a matter of hours if required.
- If you have donor dogs available you can consider giving a whole blood transfusion – see Appendix 2 for more details.
- Gently warm up the bag of blood to room temperature.
    - This can be done by leaving it out at room temperature or putting the bag in warm (but not hot) water. It is essential that this is done gently so that the red blood cells are not damaged.
- An appropriate blood giving set should be used which has an inbuilt filter to capture any clots (sourced from your supplier or Pet Blood Bank).

- When giving the transfusion always ensure there is a dedicated IV line for this. If the IV line has previously been used, e.g. for IVFT then this should be flushed with saline.
- Start the transfusion slowly at 0.5ml/kg/hr and monitor the heart rate, respiratory rate, temperature and demeanour of the patient. Monitoring should be done every 5 minutes for the first 30minutes, and then every 15minutes thereafter.
- If all is OK then after 30min increase the rate to 1ml/kg/hr.
- If all is OK then deliver the rest of the transfusion over 4 hours.
- A useful monitoring sheet can be downloaded from the Pet Blood Bank at this link: https://www.petbloodbankuk.org/media/1577/frmsis0503-transfusion-record.pdf
- The transfusion should be stopped (if not completed) after 4 hours ideally because there is an increased risk of bacterial contamination of the blood unit. This can be extended to a maximum of 6 hours if necessary (e.g. if there was a transfusion reaction meaning the transfusion was paused).
- The patient should not receive any food or medication during the transfusion. The exception to this is medication to counteract a reaction if one occurs.
- Signs of a transfusion reaction include pyrexia, tachycardia, tachypnoea and facial swelling. If this occurs then dexamethasone (0.3mg/kg IV) and/or chlorpheniramine (10mg SQ) can be given. The transfusion should be stopped, and if signs resolve then it can be restarted at a slower rate.
- After the transfusion has finished, flush the line fully with saline.

Further Treatment of Canine IMHA

A blood transfusion will act as a temporary ‘plaster’ but medication is needed to stop ongoing lysis of the red blood cells.

- Prednisolone is the most rapidly acting and effective medication, this should be given at 2mg/kg/day as a single / divided doses.

  - For patients that are not eating (and cannot be given pills direct), dexamethasone should be given at 0.3mg/kg IV q24hr.
  - If the patient is on NSAIDs for pain management these should be stopped and:
    - Omeprazole should be given at 1mg/kg BID for 7 days.
    - Alternative analgesia such as tramadol or gabapentin should be considered. In the long-term management with hydrotherapy and acupuncture can be considered.
- Further immunosuppressants: Decisions for adding in a second immunosuppressant will vary according to clinician. Some start these immediately, whilst others only use them for more severely affected dogs. For example, a marked decrease in PCV (<12%) or a patient requiring more than one transfusion, would definitely warrant consideration of more than one immunosuppressant.
  - The second line treatment is variable but is usually ciclosporin (5mg/kg q12hr) or mycophenolate (10mg/kg q12hr).
- Aspirin is also essential because these dogs are at a high risk of developing thromboembolic disease and this is one of the main factors that results in fatalities.
  - Aspirin should be given at 0.5mg/kg q12hr.
  - For small dogs, you can dissolve a 75mg aspirin tablet in 7.5ml of water and this creates a 10mg/ml solution which is easier to appropriately dose.

Monitoring

- Daily PCV and blood smears should be performed.
- As the disease progresses, or if there is a post transfusion haemolysis then bilirubinaemia, bilirubinuria or haemaglobinuria may be present. These patients must be closely monitored as the PCV is likely to decrease rapidly and a repeat transfusion may be indicated.
- If the PCV continues to decline despite appropriate treatment, and the patient is cardiovascularly unstable again then repeat transfusion may be required. The

decision to transfuse again will depend on the patient's cardiovascular status and not the absolute PCV.

- Once steroids are started the appetite usually starts to increase. If it does not, consider starting mirtazapine.
- Once the PCV is within the normal range, you can reduce the dose of immunosuppressants gradually. Prednisolone should be weaned first and this is done by reducing by 25% every 2-4 weeks.
- Repeat PCV should be performed prior to every dose reduction.
- The prednisolone can be stopped once the patient is receiving 0.25mg/kg PO q72 hours.
- Patients are usually on immunosuppressants for 3-6 months. Some will require longer term, potentially even life-long therapy.
- The prognosis is more guarded for patients requiring multiple transfusions, or for those that present with hyperbilirubinaemia.
- There is a relatively high early mortality rate, but for patients that survive to discharge from the hospital, survival is expected in 50-88% of these dogs.

Appendix 1.

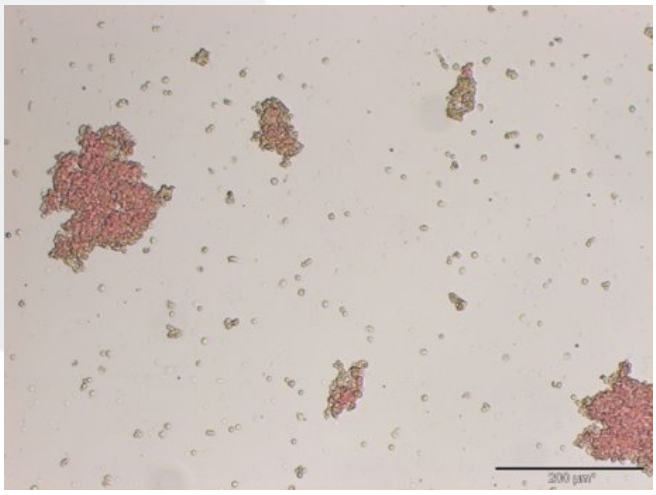

Image showing microscopic agglutination

Appendix 2.

Choosing a Blood Donor

Donor Requirements:

- Healthy, fully vaccinated, up to date with routine worm/flea prophylaxis
- 1-8years of age
- 25Kg +
- No travel history
- No previous transfusion history
- Known blood type (unless blood is to be used as a first / within 3-5days of first transfusion), in this case, send for blood typing so known for future
- A calm / easily pacified character.

Performing a Blood Donation

- A standard human blood collection bag is used (available from your supplier). This contains the correct proportion of anticoagulant.
- Fully clip and prep the jugular area. Clip a large area as if you were doing surgery around the jugular vein. This ensures it can be cleaned as effectively as possible. The area should be scrubbed with dilute hibiscrub then sprayed with spirit.
- A 16G needle is attached to the blood collection bag and this is used for venepuncture
- It can work well to lie the donor in lateral recumbency and speak gently to calm them. The jugular vein which is uppermost and therefore most visible is used e.g. the left jugular vein is used if the patient is in right lateral recumbency.
- Place the collection bag on scales intermittently so you know the amount of blood that has been collected. The collection bag should weigh between 426-521g by the end of the donation. Anything out with this will contain too much or too little anticoagulant, so it is *essential* that you collect the correct amount of blood.
- Once the appropriate amount of blood is obtained a swab should be applied to the donor's jugular vein. A light neck bandage should be placed and left for a few hours before removal.

- The donor can be fed and should be kept calm for the next 24 hours.
- The blood can immediately be given to the recipient.

Specific Note re COVID-19

- This information sheet was published on 21/04/20. BVA and RCVS guidelines may be subject to regular change over the coming months. Please check for updates at:
  BVA: https://www.bva.co.uk/
  RCVS: https://www.rcvs.org.uk/home/
- IMHA patients may require intensive nursing care and this often requires more than one staff member to be working in close proximity.
- Ensure that social distancing guidelines are maintained and/or that appropriate Personal Protective Equipment (PPE) is supplied to staff, to minimise transmission of COVID-19.
- If staffing levels or staff safety cannot be maintained to enable appropriate levels of care for the patient, then it may be necessary to consider alternative options.
- Animal welfare should be a priority, but so should human safety in these challenging and unprecedented times. Look after yourself and your team, as well as your patient.

If you would like to speak to a VVS Specialist about any of your cases, please do not hesitate to contact us:

T: 020 7043 2283

E: admin@vvs.vet

VVS Specialists are here to help and can review clinical history and test results and advise you on your cases as and when you need support.

You may be working sole charge, but you are not alone.