Feline Cardiac Disease Therapies

I understand the frustration due the lack of therapies for feline heart disease but we also need to be warry of using therapies just so that we are feeling like we are acting and therefore we need to look at the evidence behind their use. I feel the most important thing we can do for cats with cardiomyopathies is to continue to monitor them. Repeat echos are recommended to assess development of cats in stage B1 to stage B2 as this will indicate an increased risk of onset of ATE and CHF. The progression rate for individual cats is unpredictable and many cats stay in stage B1 for years and may well die of diseases other than their heart disease; these cats may never need any therapy or preventatives. For cats already in stage B2, getting the owners to monitor resting respiratory rates and reducing stress for the cat is important; a repeat echo is unlikely to change management of the case until there are clinical signs consistent with congestive heart failure.

All medication carries the potential for side effects and the stress, for cat and owner, of administrating medication daily, potentially for many years, must be factored into the assessment and balanced with any benefit. Please note that nearly all the drugs mentioned in this leaflet are not licensed for use in cats and the case vet should discuss this with the owner and obtain informed consent for their use.

Pre-clinical Cases

Overweight cats should be dieted to their ideal BCS. There is some evidence[6] that dietary intervention (restricted starch, higher protein and supplemented fish oils) may modify progression of HCM and result in some reverse remodelling. There is a Royal Canin veterinary cardiac diet for cats, but it is not available in the UK yet (January 2023).

Arterial thromboembolism (ATE) is a devastating complication of feline cardiomyopathy. Any cat with cardiomyopathy is at risk. The risk is considered increased once the left atrium has at least moderate remodelling. The FAT CAT study[1] showed clopidogrel was superior to aspirin in preventing a recurrent ATE and now the recommendation is to treat B2 cats with clopidogrel. However, there is significant individual variability in responses to clopridogrel and hence in the original FAT CAT trial, half of cats on clopridogrel still went on to develop further ATE.

In 2022 a preliminary study was published[2] studying dual therapy with clopridogrel and an oral factor Xa inhibitor anticoagulant, rivaroxaban. A low incidence (15%) of side effects was noted and these were considered tolerable (epistaxis, haematemesis, haematochexia or haematuria). Significantly, only 16% of cats that had previously had an ATE had another and no cat newly developed an ATE while on dual therapy. This is a small study but gives hope for a terrible and distressing part of feline cardiomyopathies.

- Cats with enlarged left atria (moderate or severe) or low LA FS% should get clopridogrel at 18.75mg PO q24h.

- Cats with significantly enlarged left atria, or spontaneous echocontrast, or a visible thrombus in the left atrium should probably get clopridogrel and rivaroxaban 2.5mg PO q24h. Rivaroxaban is much more expensive than clopridogrel.

Beta-blockers. Beta-blockers, in particular atenolol, used to be prescribed for pre-clinical HCM in cats especially if LVOTO was present, the thinking behind being that reducing the heart rate would improve myocardial oxygenation. However, this recommendation has changed in the last decade as studies have shown no survival benefit[3] (after 5years!) or reduction in clinical signs[4]. It used to be prescribed because it felt like we were doing 'something' and mechanistically it might make sense, but the reality has disproven their use. I, therefore, do not recommend beta-blockers to be given indiscriminately to cats with cardiomyopathies[5].

Diltiazem. Although diltiazem, a calcium channel blocker, is licensed (as Hypercard) to treat HCM, following some experimental evidence of efficacy, it is now rarely prescribed for HCM unless as an antiarrhythmic drug.

Congestive heart Failure

- Thoracocentesis should be performed when respiratory distress results from pleural effusion.
- Diuretics. Furosemide at the lowest effective dose, 0.5 to 2 mg/kg PO q8-12 h and usually starting at starting dosage is 1 to 2 mg/kg PO q12h. The maintenance dose of furosemide should be titrated to maintain a resting or sleeping respiratory rate at home of <30 breaths/min. Kidney parameters and electrolyte levels should be measured within a week of starting the diuretic and then every 1-3 months. The optimal dose of diuretic in CHF is probably just enough to control congestive signs, regardless of any azotaemia but hypokalaemia needs to be treated.
- Pimobendan. Several small studies showed well tolerated and positive effects in cats with HCM in CHF but the most recent study which was also of good quality (J Vet Intern Med 2021 Feb 5), concluded that 'cats with non-obstructive HCM and recent CHF might benefit from pimobendan whereas cats with LVOTO might not'. I therefore don't recommend the use of pimobendan unless an echo has been performed and LVOTO is not present. Unfortunately, HCM is the commonest feline heart disease and many of them have dynamic or fixed obstruction and systolic dysfunction is actually uncommon and usually an end-stage issue, but if the cat has restrictive or dilated cardiomyopathy then it could be a useful therapy. Side effects are possible, usually occurring within the first couple of weeks of starting, and consist of hyporexia/anorexia, vomiting and subclinical hypertension. The dose is 1.25mg/cat BID, available as tablets or an oral liquid from BOVA.
- Anti-thrombotics will be recommended – clopridogrel +/- rivaroxaban depending on additional risk factors.

- Angiotensin converting enzyme inhibitors (ACEi) have very poor evidence for their use in cats and as other medications take priority, and ACEi is not usually used for therapy of CHF in cats.
- Spironolactone. Again, poor evidence for its use in cats and has been associated with causing dermatitis.
- Antiarrhythmics. Ventricular ectopy is common in cats with HCM and atenolol has been shown to decrease ventricular ectopy in cats with HCM. It is recommended that cats with complex ventricular ectopy (runs of tachycardia or twins or triplets) be treated with atenolol (6.25 mg/cat q12h PO)[5] but most arrhythmias in cats do not effect them clinically and the risks of the medication may outweigh any benefits.
- Diet. A moderately-sodium restricted diet is recommended but otherwise keep to a diet that is palatable to the cat.

Refractory cases

Torsemide may be considered in place of furosemide in cats with persistent CHF despite high doses of furosemide (>6 mg/kg/day PO), at a starting dose of 0.1 to 0.2 mg/kg PO q24h and up titrating to effect. Pimobendan could be considered if LVOTO is not present as systolic dysfunction is an end-stage problem in cardiomyopathies.

References

1 Hogan DF, Fox PR, Jacob K, Keene B, Laste NJ, Rosenthal S, Sederquist K, Weng HY. Secondary prevention of cardiogenic arterial thromboembolism in the cat: The double-blind, randomized, positive-controlled feline arterial thromboembolism; clopidogrel vs. aspirin trial (FAT CAT). J Vet Cardiol. 2015 Dec;17 Suppl 1:S306-17. doi: 10.1016/j.jvc.2015.10.004. PMID: 26776588.

2 Lo ST, Walker AL, Georges CJ, Li RH, Stern JA. Dual therapy with clopidogrel and rivaroxaban in cats with thromboembolic disease. Journal of Feline Medicine and Surgery. 2022;24(4):277-283. doi:10.1177/1098612X211013736

3 Schober KE, Zientek J, Li X, Fuentes VL, Bonagura JD. Effect of treatment with atenolol on 5-year survival in cats with preclinical (asymptomatic) hypertrophic cardiomyopathy. J Vet Cardiol. 2013 Jun;15(2):93-104. doi: 10.1016/j.jvc.2013.03.003. Epub 2013 May 15. PMID: 23684504.

4 Coleman AE, DeFrancesco TC, Griffiths EH, Lascelles BDX, Kleisch DJ, Atkins CE, Keene BW. Atenolol in cats with subclinical hypertrophic cardiomyopathy: a double-blind, placebo-controlled, randomized clinical trial of effect on quality of life, activity, and cardiac biomarkers. J Vet Cardiol. 2020 Aug;30:77-91. doi: 10.1016/j.jvc.2020.06.002. Epub 2020 Jul 1. PMID: 32707333.

5 Luis Fuentes, V, Abbott, J, Chetboul, V, et al. ACVIM consensus statement guidelines for the classification, diagnosis, and management of cardiomyopathies in cats. *J Vet Intern Med*. 2020; 34: 1062– 1077. https://doi.org/10.1111/jvim.15745

6 van Hoek I, Hodgkiss-Geere H, Bode EF, Hamilton-Elliott J, Mõtsküla P, Palermo V, Pereira YM, Culshaw GJ, Laxalde J, Dukes-McEwan J. Association of diet with left ventricular wall thickness, troponin I and IGF-1 in cats with subclinical hypertrophic cardiomyopathy. J Vet Intern Med. 2020 Nov;34(6):2197-2210. doi: 10.1111/jvim.15925. Epub 2020 Oct 29. PMID: 33118674; PMCID: PMC7694815.