Medicine on a budget

or PARR can be quicker and in some cases cheaper than by immunohistology.

Appropriate staging in lymphoma remains a controversial area and the amount of staging is defined by the budget as much as the clinical situation, as there is little point staging a patient so thoroughly they cannot be treated. Haematology, biochemistry and urinalysis remain a sensible baseline from which to make further assessments. If these are unremarkable and the patient is systemically well (sub-stage a) with nodal forms of lymphoma the diagnostic yield of thoracic and abdominal imaging and bone marrow biopsy is often low. In systemically unwell patients and those with significant organ dysfunction, staging is of greater value as it can help guide treatment decisions.

The choice of treatment protocol is the biggest decision of treatment planning as it affects the outcome as well as the cost. Single-agent protocols are cheaper, but less efficacious than multi-agent protocols and hence the prognosis with single-agent treatment is poorer. Some chemotherapy agents need to be prepared fresh on each occasion, for others a vial can be reused several times over a few weeks, providing of course it is kept in a sterile condition; this can lead to some savings for the client. Another way to save some money on drugs that are being used infrequently is to order in pre-prepared doses for a particular patient.

Occasional side effects are inevitable when treating a number of patients with chemotherapy and, as well as the effect on patient quality of life, the cost of managing side effects can quickly add up, especially if hospitalisation is necessary. It is therefore important to prevent side effects or limit their severity to mitigate against these costs. Some areas of particular importance are considering the body condition score of each patient when calculating doses, encouraging clients to call early when gastrointestinal side effects are seen, preventing sterile haemorrhagic cystitis, monitoring for neutropenia and preventing drug extravasations.

In conclusion, excellent client communication and carefully considered conservative treatment decisions are key to a good outcome on a budget.

KEY LEARNING OBJECTIVES

- The costs of immunophenotyping and staging for lymphoma need to be weighed against the benefits in the context of the available budget

- The choice of treatment protocol is the most significant determinant of cost and prognosis
- The costs of unexpected, severe and poorly managed side effects can escalate rapidly and care should be taken to prevent/minimise adverse effects of treatment

MULTIPLE CHOICE QUESTIONS

1. Which of these forms of lymphoma can be treated successfully with prednisolone and chlorambucil only?
 - a. Diffuse large B cell lymphoma
 - b. Large T cell lymphoma
 - c. Epitheliotrophic lymphoma
 - d. Indolent lymphoma
2. Which of the following can be helpful in preventing sterile haemorrhagic cystitis in the dog after cyclophosphamide treatment?
 - a. Administration of furosemide
 - b. Encouraging increased fluid intake
 - c. Allowing free access to the outdoors to encourage urination
 - d. All of the above
3. When should a bone marrow biopsy be considered in the staging of the lymphoma patient?
 - a. In patients with hypercalcaemia
 - b. In patients with documented stage IV disease
 - c. In patients with significant cytopenias
 - d. In patients with central nervous system (CNS) involvement
4. Which of the following drugs causes a severe extravasation reaction if administered perivascularly?
 - a. Cyclophosphamide
 - b. Dexamethasone
 - c. Doxorubicin
 - d. Cytosine arabinoside
5. What is the difference in median survival time between dogs with stage III multicentric lymphoma versus multicentric lymphoma stage IV treated with multi-agent chemotherapy?
 - a. 6 months
 - b. 4 months
 - c. 2 months
 - d. There is no difference

Feline uveitis

David Maggs

Although the aetiological diagnosis in feline uveitis can be expensive, the drugs needed to treat feline uveitis are almost always inexpensive, especially the empirical treatment of uveitis which is inevitable when a cause is not found despite looking or because owners will not permit testing. However, cost considerations must be balanced against knowledge that insufficiently potent, chronic or focused treatment may require more recheck examinations or result in painful,

blinding sequelae (synechia, glaucoma, cataracts, retinal detachment) that necessitate enucleation.

ACTIVE AND ACUTE UVEITIS

- Intraocular pain: blepharospasm, epiphora, lethargy, anorexia, hiding
- Iridal swelling: loss of normal 'texture' (use magnification and a focal light directed obliquely across the iris)
- Conjunctival or episcleral hyperaemia: subtle in cats
- Breakdown of the blood–ocular barrier: blood components in the anterior chamber, vitreous, or subretinal space. One of the few pathognomonic signs

of uveitis. Look for hypopyon (white blood cells), hyphaema (red blood cells), fibrin clumps, aqueous flare (albumin and other small proteins), keratic precipitates (white blood cells and inflammatory proteins clumped against the corneal endothelial surface) or exudative retinal detachment

- Miosis: best detected by retroillumination (see Top tips for your feline eye examination) or by resistance to dilation following application of tropicamide
- Corneal oedema
- Low intraocular pressure (IOP)

CHRONIC (ACTIVE) UVEITIS OR PREVIOUS UVEITIS

- Intraocular pain: lethargy, anorexia, hiding
- Rubeosis iridis (iridal neovascularisation) evident as a reddish blush over iris face; indicates chronic active uveitis
- Scarring/adhesions:
 - Glaucoma (scarring of iridocorneal angle)
 - Anterior or posterior synechia (adhesions between the iris and corneal endothelium or lens, respectively)
 - Phthisis (globe contracture)
 - Retinal detachment (due to contraction of vitreous fibrin)
- Cataracts and corneal oedema/fibrosis/vascularisation (due to altered aqueous humour composition and circulation)
- Lens luxation due to enzymatic lysis or phagocytosis of zonules, cataract development, buphthalmos due to secondary glaucoma

DIAGNOSTIC APPROACH

Ocular testing (diagnoses uveitis)

- Retroillumination (assess for anisocoria)
- Flare assessment
- Tonometry
- Fluorescein staining

Systemic testing (diagnoses likely cause)

- History and physical examination
- Complete blood count (CBC), biochemistry panel, urinalysis
- Serological/polymerase chain reaction (PCR) testing for infectious agents
- Thoracic and abdominal imaging ($\pm$ aspirates)
- Peripheral lymph node aspirates
- Aqueocentesis

Although a cause is found in only ~30% of cats, testing is essential to permit appropriate doses of steroids in the remaining 70% identified as idiopathic.

TREATMENT

- Treatment goals: treat causative antigen and rapidly control intraocular inflammation
- Corticosteroids: first choice when safe. Always start topically (if no corneal ulcer). Topical prednisolone

acetate or dexamethasone will penetrate through cornea; hydrocortisone will not. Up to q2h if severe then taper. Use systemically once a cause responsive to corticosteroids has been found or those known to be worsened by corticosteroids have been eliminated

- Non-steroidal anti-inflammatory drugs (NSAIDs): less potent but useful in cats with diabetes, can often be administered systemically even when infectious disease is suspected or proven. General comments regarding dose and route made for corticosteroids apply equally to NSAIDs
- Atropine: paralyses iris sphincter and ciliary body muscles causing mydriasis and cycloplegia, respectively, which reduce pain and many complications of uveitis, but increase the chance of peripheral anterior synechia and glaucoma

KEY LEARNING OBJECTIVES

- To recognise the signs of acute and chronic uveitis in cats
- To understand the ocular and systemic diagnostic approach to detect uveitis itself and its causes, respectively
- To understand the risks and benefits of, and appropriately select, anti-inflammatory agents (type, dose, route and taper) for treatment of cats with uveitis

MULTIPLE CHOICE QUESTIONS

1. Which of the following statements about signs of anterior uveitis in cats is correct?
 - a. Typically are more overt than they are in dogs
 - b. Are – in the main – pathognomonic and easily recognisable
 - c. May include lethargy, corneal oedema and resistance to pupillary dilation
 - d. Include elevated intraocular pressure
2. Which of the following statements about signs of anterior uveitis in cats is correct?
 - a. May be used to aid in the differentiation of acute from chronic uveitis
 - b. Include phthisis in acute cases
 - c. Include anterior synechia as a result of adhesions between the lens and cornea
 - d. Require referral for detection
3. Which of the following statements about diagnostic testing for the cause of uveitis in cats is correct?
 - a. Is successful in about 70% of cases
 - b. Guides therapy whether a cause is found or not
 - c. Requires referral to an internal medicine specialist
 - d. Relies on testing of the eye only
4. Which of the following statements about corticosteroids for the treatment of uveitis in cats is correct?
 - a. Should not be used topically when an infectious cause is suspected or confirmed
 - b. Are less effective than NSAIDs
 - c. Should be withheld systemically until a cause is detected or at least until some causes have been eliminated
 - d. Should not be used systemically if a corneal ulcer is noted

Medicine on a budget

5. While awaiting diagnostic test results, what would a logical antibiotic choice for a cat with uveitis be?
- Topically applied tetracycline
 - Systemically administered clavulanic acid–amoxicillin

- A combination hydrocortisone–antibiotic ointment for the steroid component
- Systemically administered doxycycline

Paralysis to pain: spinal problems on a budget

Peter Smith

The cornerstone of doing things economically is not spending money on expensive diagnostic tests. You'll hear it again and again but a decent neurological examination combined with signalment and history can go a long way to generating a relatively short differential diagnosis list.

Spinal problems manifest themselves either as pain, paresis or a combination of the two. If pain is the problem and you feel that disc disease is the most likely cause, it can be perfectly reasonable to treat symptomatically with analgesics and restricted activity – after all, you wouldn't expect to be rushed into magnetic resonance imaging (MRI) if you hurt your back. On the other hand, spinal pain can be very severe and might warrant a more aggressive approach. For example, cervical disc extrusions can be excruciatingly painful and oral analgesics might be ineffective in controlling this; undertaking tests (e.g. radiographs) to rule out some differential diagnoses before adopting this conservative approach might simply postpone definitive treatment and increase costs in the long run. Thoracolumbar disc lesions also sometimes manifest themselves simply as pain and, for similar reasons, it might be more sensible to recommend definitive investigation and treatment. On the other hand, MRI isn't necessarily the right test to perform – discospondylitis and bone neoplasia can often be identified radiographically, obviating the need for further tests in many cases. In dogs with a suspicion of meningitis, the best approach is likely to be cerebrospinal fluid (CSF) analysis, even though that might appear an expensive test to start out with. Taking radiographs and/or blood samples in such cases might be interesting, and might well show evidence of a systemic inflammatory response, but it will cost clients more money in the long run.

For animals with para- or tetraparesis, you can also go a long way to reaching a diagnosis without investigating. Thus, when confronted by a young Labrador Retriever, with a peracute onset paralysis at exercise and no evidence of pain, the likelihood is that there is a non-compressive spinal cord lesion and a better use of owner's money will be on nursing and physiotherapy. There's always a risk that you're wrong, of course, but if you're doing things on a budget, this is a risk that you have to accept. Even in dogs which probably have compressive spinal cord disease, a conservative approach can lead to recovery in a significant proportion of dogs. However, this is better reserved for dogs that remain able to walk without support and it might be that the better (and ultimately more cost-effective) approach is to go straight for definitive surgical treatment. This lecture will discuss some of the approaches to conservative management of spinal cord disease.

KEY LEARNING OBJECTIVES

- To review how to localise spinal cord lesions through neurological examination
- To recognise the types of case that can be managed conservatively
- To recognise that doing things on a budget doesn't necessarily mean doing things cheap – it means doing the most sensible diagnostic test to get to the bottom of the problem and not doing pointless cheaper tests

MULTIPLE CHOICE QUESTIONS

1. Terry, a tiger in the body of a Dachshund, is presented with acute-onset hindlimb paralysis. There is no voluntary movement in the pelvic limbs, though sensation remains; thoracic limb function is normal. The owner, wealthy but financially prudent, is reluctant to spend money unless absolutely necessary. What do you recommend?
 - a. Prompt referral for MRI and spinal surgery if necessary
 - b. Cage rest for a few days, with appropriate analgesics
 - c. Radiographs of the vertebral column
 - d. Discharge with steroids and instructions for restricted activity
2. Bob, a 7-year-old Border Collie, is struggling with stairs and doesn't jump up into the car very reliably; this has become worse over the preceding fortnight. Your examination shows no neurological deficits but pressure of the lumbosacral junction brings out Bob's latent sheep disciplining tendencies. His hips seem normal and he has no other obvious problems. The owners have a budget of £2000. What do you do?
 - a. Recommend an MRI scan to evaluate the lumbosacral region
 - b. Suggest some radiographs of the vertebral column
 - c. Give him some NSAIDs and suggest restricted activity for a couple of weeks
 - d. Take a urine sample and start treating him with antibiotics pending the results of urine culture
3. Spike is a 5-year-old Springer Spaniel with no history of illness. He has become very weak over the last 48 hours and is unable to walk when presented. Your general examination shows nothing untoward but neurological examination shows profound weakness in all four limbs, with no clear source of pain. Spinal reflexes are poor and the withdrawal reflexes are absent, though sensation remains good. Despite this, Spike remains as interested as ever in his breakfast and does his best to turn and bite you when you squeeze his toes. The owner is happy to spend up to £400 if she can get him to recover but no more. What do you recommend?

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