A canine-specific anti-nerve growth factor antibody is effective for the alleviation of osteoarthritis-associated pain in dogs

David Knazovicky¹, Mila Freire¹, Beth Case¹, Katrina Jiamachello¹, John Innes⁴, David Gearing⁵, Duncan Lascelles^{1,2}

¹ Comparative Pain Research Laboratory, Department of Clinical Sciences, College of Veterinary Medicine, North Carolina State University, Raleigh, NC, USA

² Center for Comparative Medicine and Translational Research, Department of Clinical Sciences, College of Veterinary Medicine, North Carolina State University, Raleigh, NC, USA

³ Center for Pain Research and Innovation, UNC School of Dentistry, Chapel Hill, NC, USA

⁴ Chestergates Veterinary Specialists, Chester, UK

⁵ Nexvet Biopharma, Melbourne, Australia

Osteoarthritis (OA) is the most common cause of chronic pain in dogs. Non-steroidal anti-inflammatory drugs (NSAIDs) are the only approved class of drugs for OA pain in dogs. Neutralizing antibodies against Nerve Growth Factor (NGF) are analgesic in rodent models and in humans with OA. The aim of this pilot study was to evaluate the efficacy of a novel caninised anti-NGF

antibody (NV-01) for the treatment of OA pain in dogs.

In a placebo-controlled, masked, clinical study, 26 dogs were randomized to receive NV-01 (200 mcg/kg IV) or placebo. Owners completed validated clinical metrology instruments (Client-Specific Outcome Measures [CSOM], Liverpool Osteoarthritis in Dogs [LOAD] and Canine Brief Pain Inventory [CBPI]) on days 0, 14 and 28. LOAD, CSOM and CBPI subscales (pain severity [PS] and pain interference [PI]) were evaluated within and between groups non-parametrically (GraphPad Prism 6). Recognized success/failure criteria were applied and success compared between groups using Fisher's exact test.

There were no differences between the groups for age, sex, bodyweight or body condition score. CBPI PS and PI scores did not change in the placebo group, but significantly improved in the NV-01 group (PS: Day 0-14, $p=0.006$ and Day 0-28, $p=0.02$; PI: Day 0-14, $p=0.006$ and Day 0-28, $p=0.032$). There were no differences between the groups for CBPI scores. LOAD scores showed similar improvement from Day 0-14 ($p=0.002$) and Day 0-28 ($p=0.002$) in the NV-01 group and a significant difference between groups for the change in score at Day 14 ($p=0.011$) and Day 28 ($p=0.017$). CSOM scores showed a similar pattern of improvement, with a significant difference between the groups at day 14 and day 28 ($p=0.009$ and $p=0.03$, respectively) and significantly more successes at day 28 ($p=0.047$). No side effects were noted.

These pilot data demonstrate a positive analgesic effect of an anti-NGF antibody in client-owned dogs suffering from chronic osteoarthritis pain. The magnitude of the effect was similar to that reported with an NSAID.

Funding source: Nexvet Biopharma Pty Ltd

Health and welfare of dogs owned by homeless people

Sarah Hogg, David Williams

Department of Veterinary Medicine, University of Cambridge, Cambridge, Cambs, UK

Many people consider that homeless people should not have companion animals, considering that their health and welfare would not be adequate, yet there does not appear to be an evidence base for this assertion. Here we evaluated the health and welfare of dogs owned by homeless people (dhl) and those owned by individuals living in homes (dh).

Fifty dhl and 50 dh were examined in Cambridge and London after approaching their owners on the street. Owners were questioned about the animal's origin, length of ownership, diet and exercise regime and whether routine veterinary care was available. Dogs underwent a routine clinical examination. Owners were asked about any health or behaviour

problems. Interviews were conducted with a technique sensitive to the emotional perspective of homelessness.

Ages of dh and dhl differed significantly ($5.4\pm3.9y$ and 3.8 ± 2.6 respectively $p=0.03$). Body condition score was significantly different (5.7 ± 1.2 range 4-9 and 4.5 ± 0.9 range 3-6 respectively). dhl were significantly more likely to be quiet and friendly on examination, whereas dh were more likely to display aggression towards the person examining the dog. dh showed significantly increased inappropriate barking ($p=0.002$) and chewing and destructive behaviour ($p=0.006$) but no significance was found for incidents of aggression ($p=0.105$) or separation anxiety ($p=0.102$). Signs indicative of physical health did not differ significantly between dh and dhl while regular access to veterinary care was far higher amongst settled dog owners, with 95.5% reporting routine use of a veterinarian. For dhl owners 29% reported no access to veterinary care, 46% stated that they would use a charity clinic if needed while 25% named a clinic with which they were a registered, regular client.

The study showed that dhl were not less healthy than dh. Indeed dhl showed a healthier range of body condition scores and a preferable range of behaviour than did dh.