



Proceedings

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Edited by Helen Zulch & Tiny De Keuster

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2pm – welcome

2:05 – Keynote **D Mills “Understanding the relationship between pain and behaviour in clinical behaviour practice”**

3:05 – break

3:10 Paramasivam S “A preliminary study on preparedness in veterinary behavioural medicine among veterinary students in the United Kingdom”

3:25 Bussièrès H “Impact of living conditions on repetitive behaviours in dogs”

3:40 Argüelles J “The effect of two anxiolytic drugs on learning in dogs: Preliminary findings”

3:55 Piotti P “Demographics, personality, and relationship with owners affected pets’ quality of life during COVID-19 lockdown”

4:10 – break

4:30 Amadei E “Case report: Noise and thunderstorm sensitivity in a dog with chronic pain”

4:45 Jahn K “Management of stress during international air travel in 4 cats – a case series”

5:00 Bussièrè H “Bengal and Savannah hybrid cats: do they behave differently from other domestic cats?”

5:15 Bleuer-Elsner S “The cage as an educational and therapeutic tool for dogs: results of a dog’s owners questionnaire enquiry”

5:30 – break

5:35 Amadei E “Case report: An aggressive behaviour in older dog allowed us to assess her “overall” health”

5:50 Salgirli Demirbaş Y “A Canine Food Reaching Task (CanFoRe): A New Tool To Assess Paw Preference In Domestic Dogs”

6:05 Riggio G “Correlation between serotonin and tryptophan serum concentrations in shelter dogs undergoing a stressful procedure”

6:20 – close

Improving horse welfare and behaviour: recent advances and open challenges in equine science

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No conflict of interest to declare

There are approximately 5 million horses in Europe (FAOSTAT, 2018): thanks to their adaptability they can be raised for several reasons, ranging from companionship to leisure and sport activities, and even food production. This aspect greatly influences their management, their relationship with humans, their behaviour and, thus, their welfare. Horses are large prey animals for which domestication has dampened, but not extinguished, innate biological flight responses (Brubaker and Udell, 2016). For this reason, several stimuli can be perceived as dangerous, inducing a flight reaction, thus playing an important role in the development of problematic behaviours (e.g. aggression, fear, phobias). Many behaviour problems in horses are associated with confinement in single boxes, the most common housing system in different countries (Hotchkiss, Reid and Christley, 2007; Visser *et al.*, 2014; Hockenhull and Creighton, 2015; Larsson and Müller, 2018). Indeed, confinement prevents horses from satisfying highly motivated behaviours such as free movement and social interactions with conspecifics (Dalla Costa *et al.*, 2016). Another important issue concerns pain assessment: it is reported that lameness and back pain are the most common problems in horse athletes with an estimated prevalence varying from 27% to 100% of the “healthy” ridden horse population (Landman *et al.*, 2004; Fonseca *et al.*, 2006; Visser *et al.*, 2014). Although in the past decade the scientific research in horse pain assessment has increased and many different tools have been developed (Dalla Costa *et al.*, 2014; van Loon *et al.*, 2014; Glerup *et al.*, 2015), reliable pain recognition is still difficult. Especially for horse owners pain recognition is still very difficult, as no gold standard is available. Therefore, horses often continue to be used in athletic activities despite the discomfort/pain felt. Painful conditions affects the development of behavioural problems, such as escape attempts and aggression, that are very dangerous for both the horses and the rider. On the other hand, reduced sport performance could lead to the use of “too-severe” training aids causing further pain and worsening the problem (Hockenhull and Creighton, 2012).

A review of recent scientific studies, emphasising the link between horse management, behaviour and welfare will be presented, highlighting the conceptual and methodological issues scientists have faced, as well as discussing the advantages and future challenges in equine science.

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Social Learning in Shelter Dogs: the 'Your Friend is My Friend' method.

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The authors certify that they have no affiliation with or involvement in any organization or entity with any financial or non-financial interest in the subject or materials discussed in this abstract. All dogs were treated in respect of the regulations on the ethical treatment of animals as defined by the RSPCA ethical code (RSPCA, 2014).

Introduction

With the purpose of increasing dogs' adoptability in RSPCA centres, we are piloting a method to facilitate the introduction of new people to dogs that show aversion responses towards strangers. This method is based on the gradual exposure of dogs to unfamiliar people with the mediation of one or two familiar members of our staff who act as informers and demonstrators.

Learning from a human demonstrator and using the emotional information provided by a human informant about a novel stimulus to guide future behaviours have been investigated and reported in dogs (Marshall-Pescini et al., 2011, 2012; I. Merola, Prato-Previde and Marshall-Pescini, 2012; Isabella Merola, Prato-Previde and Marshall-Pescini, 2012; Range and Virányi, 2013; Fugazza and Miklósi, 2015; Duranton, Bedossa and Gaunet, 2016; Fugazza et al., 2018).

Methodology and preliminary results

We started to pilot this method with ten dogs who were not considered adoptable at that time because of difficulties in introducing them to unfamiliar people.

Procedure: a familiar member of staff interacts in a friendly way with an unfamiliar person who gives him/her a treat or a toy. The dog is watching while on lead (held by another staff member) or kennelled and then receives the treat or toy from the familiar person. This procedure can be summarized as follows:

1. The dog will be on the lead with someone they trust (F1) or kennelled. If the dog is on lead a second person (F2) that the dog trusts will be part of the initial scenario. If the dog is kennelled, F1 will be close to the kennel door. A stranger (S) will be initially positioned in a way that does not trigger excessive reaction from the dog.
2. F1 (or F2 if the dog is on lead) approaches S and, making the action obvious and theatrical, S talks in a friendly way to F and puts a tasty treat into F's hand whilst the dog is watching.
3. F receives the treat and talks in a friendly way to S, then approaches the dog and hands them the treat.
4. Steps 1-3 are repeated a few times and if the dog's behavioural signs indicate a lower level of arousal and a more positive affective state then S can start to approach F to give the treat. F remains between S and the dog.
5. If successful and the dog's body language expresses positive emotions and interest in the proposed scenario, S gets closer to F and to the dog, acts in a friendly way and hands a treat that F will then give to the dog. Eventually S delivers the treat directly to the dog.

To help dogs to focus on the proposed scenario and minimize the stressful and distracting effect of the unfamiliar person, a few trials with only familiar members of staff precede sessions with an unfamiliar person.

Six dogs showed improvement and were made adoptable, four dogs are still in treatment. Sadly, during COVID-19 pandemic social distancing, face mask rules and restrictions on public visits to kennels are limitations to the implementation of this method.

Main point of discussion

1. What are the possible theoretical, practical, and ethical limitations of this method in a shelter environment?
2. How does this method compare to other approaches based on associative learning only?

Conclusions and implications for the field

Social learning might be applied and implemented in shelters to improve dogs' adoptability.

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Seven-week-old puppy performance during a standardized behavioural test: influence of breed groups based on genetic relatedness

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Findings from the scientific literature seem to confirm that conducting behavioural tests at 7 weeks of age is too early to reliably predict the temperament and personality of a dog. The potential for evaluation of dog-human relationships or the predisposition to learn from humans could however be interesting at this age, since puppies are usually adopted around their eighth week (Miklósi, 2018). This period is sensitive for early life learning and conditions during this time could have important consequences in adulthood. In 2007 Parker et al., published an interesting phylogenetic study including 132 dog breeds that were categorized in five clusters (Ancient, Modern, Mastiff-Terrier, Herding Sight Hound, Mountain).

The aim of this study was to evaluate the effect of breed cluster based genetic relatedness in 95 puppies in relation to their scores after a test consisting of five tasks from the Volhard test: social attraction, following, retrieving, sudden appearance and noise (Volhard and Volhard, 2007). During each task, the behaviour of each pup was scored on a scale (3-5 point) that reflected the suitability of the pup's reaction to the task (Alberghina et al., 2020). Scores were evaluated for two aggregate indicators (dog-human interaction: social attraction test and following test and learning predisposition: retrieving test, sudden appearance test and noise test). Mean scores were analysed by proportional odds model for ordinal logistic regression where single variables for each test (genetic relatedness group, sex, litter size and environment) were specified in an additive model.

The Mastiff-Terrier and Modern groups showed a tendency to have lower scores than Herding Sight Hound in "dog-human interaction" indicator. The Mountain group tended to have lower scores than other groups and stimulating environment was positively associated with high scores for the "learning predisposition" indicator. Our results support the hypothesis that genetic relatedness group and environment influences the performance of seven-week-old puppies on a behavioural test. The most obvious limitation in this research was that of small sample size, a limitation that prevented a multifactorial analysis of variance, covering all genetic and environmental factors. These preliminary findings have direct implications for dog breeders illustrating that a stimulating environment of dam and puppies could influence learning predisposition in dogs.

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Sleep duration and characteristics in UK dogs - what is normal?

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Introduction

Optimal sleep duration and quality is difficult to define. In humans, chronic inadequate sleep is a risk factor for physiological and emotional problems. Reduced sleep amplifies human reactivity in response to recognition of “anger and fear emotions” in others (Gujar et al, 2011). It has also been shown to increase the risk of impulsive and “aggressive” behaviours in forensic psychiatric patients (Kamphuis et al, 2014).

Parallels have been drawn between human and canine sleep both in physiological nature (Bodizs et al, 2020) and affective and cognitive processing (Gergely et al, 2020). In the human field there is evidence for an intimate and causal relationship between sleep and emotional brain function (Goldstein and Walker 2014) and anecdotal support exists in the field of veterinary behavioural medicine for a correlation between dogs diagnosed with anxiety disorders and those achieving a low duration and quality of sleep.

It is reasonable to suggest that a reduced quantity of canine sleep has emotional, cognitive and behavioural repercussions similar to human sleep deprivation, however no clear data exists on common canine sleep durations.

In the absence of reliable data regarding normal canine sleep durations it is a challenge for clinicians to determine if a dog is sleep deprived or to give recommendations to caregivers as to how much sleep their pet should be getting. This study assesses caregiver-reported durations of sleep achieved by pet dogs in the UK, to establish a baseline average sleep duration. The caregiver-reported characteristic behaviours of sleep are also assessed.

Methods

Ethical approval was granted; reference: BRCT01. An online questionnaire was distributed via social media using snowball sampling from July to September 2020. Responses regarding 1330 pet dogs were received with 49% female (n=642) and 51% male (n=679) and 143 breeds represented.

Results

The two most commonly reported sleep durations band were 10 to 14 hours (28% of responses) and 12 to 16 hours (24% of responses). Over 60% of responses reported each of the following characteristics of sleep for their dog; breathing more slowly, eyes shut, staying still, twitching or vocalising as if dreaming and reduced muscle tone. Only 39% of responses reported that their dog was “unresponsive to stimuli that would normally cause excitement”, when asleep. Of responses stating the caregiver’s own daily routine had changed due to Covid-19 “lockdown” (61%), 57% reported no change to the duration of sleep their dog achieved during this period.

Conclusions

The data collected through this study provides a representation of common sleep durations in the UK dog population. Information about how caregivers determine “sleep” by behavioural observations is also reported. This study provides a basis for further investigating the sleep requirements of the domestic dog, the accuracy of perception of sleep amongst canine caregivers in the UK and the potential for these factors to be relevant to clinical behavioural medicine cases.

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Understanding dogs who react to other dogs (*Canis lupus familiaris*)

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The term “dog reactive dog” (DRD) has become popular with the general public to describe dogs exhibiting substantial agonistic displays around other dogs. There is extensive literature concerning the rules and strategies used by many species in agonistic interactions (Arnott and Elwood, 2008; Arnott and Elwood, 2009; Gabor, 2010; Hardy and Briffa, 2013), but little is known about this in relation to DRD’s or the scale of the issue. This study describes the differential forms of DRD’s with the longer-term goal of offering more specific and rationalised management and treatment strategies.

An online owner questionnaire was developed using Qualtrics™. Items covered include demographics, medical/ behavioural/ training history and the frequency with which a subject exhibited specific reactive behaviours (barking, growling, snarling, whining, lunging, snapping, nipping, biting, and raised hackles). The questionnaires were distributed using social media (Reactive dog UK Facebook group) and University of Lincoln media channels. Data collection occurred for the period November 2018 to February 2019.

To determine the structure of reactive behaviour shown by DRD, a principal component analysis was used on the nine reactivity variables. The data was transformed from frequency scores of never/sometimes/always into 0/1/2 respectively. An oblimin rotation was used since it was hypothesised that the variables would not necessarily be independent. The data was prepared using Excel 2013 and statistical analysis was undertaken using IBM SPSS v25. The study was approved by the relevant University ethics committee with approval number UID CoSREC439.

Principal component analysis of the reactive behaviours’ of 1959 subjects identified three factors which explain 63% of the variance in the data. The robustness of these relationships was confirmed using agglomerative cluster analysis using Ward linkage. Barking, lunging and whining loaded together and from a motivational/emotional perspective may be termed ‘frustration’ related behaviours. Growling, snarling and stiff hackles loaded together and may be termed ‘threat’ related behaviours. Nipping, snapping and biting loaded together and may be termed ‘contact/harm’ behaviours. Further analysis of items within the questionnaire is ongoing.

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Equine Appeasing Pheromones (EAP) slightly influences the maternal serum serotonin in response to a short separation from their foal: a preliminary study

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No conflict of interest to declare

Pheromones are odourless volatile compounds released into the environment through body secretions and perceived by members of the same species, in which they trigger a behavioural or hormonal response (Karlson and Luscher 1959). Recently, increasing attention has been directed toward potential therapeutic applications in stressful events of a different class of pheromones, the so-called appeasing pheromones, which are secreted in the breast region shortly after delivery and characterized by almost the same chemical structure in all mammals. It is hypothesized that equine appeasing pheromones (EAP) may have a calming or reassuring effect and are produced near the mammary glands of dams after parturition (Mills, 2005). Serotonin (5-HT) is suggested to be anything from a fine modulator during stress to a neurochemical grossly affected by stressors, possibly as a reflection of the activity/arousal level of the individual (Chaouloff et al., 1999). In a previous study a short separation from foals significantly decreased 5-HT levels in mares (Alberghina et al, 2019).

The aim of this study was to evaluate if an analogue synthetic of EAP applied as nasal gel could modulate 5-HT responses of mares in the context of a short separation from their foals. The protocol and the study design were approved by the Ethical Committee of the Department of Veterinary Sciences of the University of Messina (code 030/2019).

Eight mares with their foals were randomly allocated to treatment (A) or control group (B). On the day of separation EAP or placebo was applied to the mother in the form of an intranasal wipe by a handler. Blood sampling was performed 30 min prior to separation (T0 and treatment administration), at 30 min after separation (T1) and 30 min after the return of the mother to the box (T2). The 5-HT serum concentration was measured by ELISA.

The effects of treatment (A vs B), time (T0 vs T1 vs T2) and time*treatment interaction were analysed by a two-way ANOVA. All these analyses were realized thanks to SAS 9.4 software Copyright (c) 2002-2012 by SAS Institute Inc., Cary, NC, USA. The significance threshold was classically fixed at $P < 0.05$.

A slight but not significant effect of treatment ($F=3.79$; $DF=1$; $P=0.0656$) was found. At T0 the treated group had mean 5-HT values equal to 324 ng/ml compared to mean value of 371 ng/ml for the control group. On T1, realised after the separation, the treated group had mean 5-HT values equal to 324 ng/ml compared to mean value of 346 ng/ml for the control group. Finally, on blood collection T2, realised after the rapprochement, the treated group had mean 5-HT values equal to 334 ng/ml compared to mean value of 357 ng/ml for the control group.

During the separation period, treated mares showed levels like basal values whereas in control mares 5-HT levels were lower. Influence of treatment could probably have been statistically significant with a larger sample size.

Our results are preliminary, further studies are necessary to evaluate if EAP, through 5-HT modulation, could help horses to cope with stress.

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Behavioural pain indicators around farrowing in sows.

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Although it is widely accepted that parturition is likely to be painful, there are few studies investigating pain specific behaviours associated with the progression of farrowing. The objective of this study was to evaluate pain specific behaviours during three different phases of farrowing: intervals between delivery of two consecutive piglets, the minute after and before piglet expulsion and 19 days after farrowing (no-pain associated to farrowing). Ten Dandred sows (5 nulliparous and 5 multiparous) were studied. Sows were continuously recorded during the entire farrowing and on day 19 post-farrowing for 2 hours. One observer visualized 56 hours of video: 4.7 hours during piglet expulsion, 23.9 hours during the interval between two consecutive piglets and 27.4 hours post-farrowing. Five behavioural pain indicators (BPI) were assessed: trembling, pawing, forward movement of the back leg, back arching and tail flicking. BPI were analyzed using Kruskal-Wallis and Wilcoxon-Mann-Whitney tests. All BPI showed significant differences ($p < 0.01$) between the three phases of farrowing. All BPI were rare or absent post-farrowing, and almost all of them were more frequent during piglet expulsion. Trembling was the only BPI with a higher incidence during the interval between two consecutive piglets compared to piglet expulsion (2.55 vs 1.83 events/sow/hour respectively). Forward movement of the back leg was the most prevalent BPI, showing a frequency of 5.60 events/sow/hour during the birth interval and 11.15 events/sow/hour during piglet expulsion. We conclude that sows experience more pain during farrowing than during the third week post-farrowing and that piglet expulsion is the most painful phase of farrowing.

The experimental protocol described in this experiment was approved by the Institutional Animal Care and Use Committee of the Universitat Autònoma de Barcelona (CEEAH-5377).

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Serotonin assays in clinical practice. Do sex and activity play a role in serotonin concentrations in equine plasma?

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Horses involved in different activities display different emotional responses (Mendonça et al., 2019). Variations in plasma serotonin concentration have been associated with different emotional responses/states in other species (Bacqué-Cazenave et al., 2020). This study aimed to investigate plasma serotonin variations between females and geldings, and between horses involved in competition and in equine-assisted therapies (EAT) to better understand what factors could influence serotonin plasma concentrations.

Forty-six horses (10 ± 4 years-old) were involved in this study: 19 females; 27 geldings. From this population, 17 horses were involved in competition and 9 in EAT. No exercise was applied prior to blood sampling, and all the horses were fed at 8 a.m. as usual. Blood samples were collected through jugular puncture between 9 a.m. and 10 a.m. Plasma serotonin (5-HT) was measured using validated enzyme immunoassay, as described by Chabaud et al. (2018). Statistical analysis was carried out using 9.4 SAS software.

No significant differences were observed either between females and geldings (Student t-test; $DF=43$; $t=0.99$; $p=0.33$) nor between competing horses and EAT horses (Wilcoxon Two-Sample test; $DF=24$; $Z=0.54$; $p=0.59$).

The present results suggest that sex and activity do not influence serotonin concentration in equine plasma. Competing and EAT horses display different emotional responses, thus the absence of differences in serotonin plasma concentration between these horses is interesting. These results complement our understanding of serotonin physiological variations in equine plasma, which is necessary before applying serotonin assays in routine clinical practice. Indeed, serotonin assays seem promising for the improvement of evidence-based clinical practice.

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Whippet and Italian Greyhound interspecific social behaviour: preliminary data from an Italian survey

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Introduction

Sighthounds have been found to differ from other dogs in some physiologic and behavioural characteristics (Elliot et al., 2010; Mesa-Sánchez et al., 2016). Whippet and Italian Greyhounds (IGs) are popular among sighthound breeds, but little has been published about their behaviour. The use of survey is an effective methodology to collect information from owners about health and behavioural problems of their dogs (Dotson & Hyatt, 2008; Pirrone et al., 2015; Herwijnen et al., 2018). The main aim of our questionnaire was to investigate health and behavioural problems and features of Whippet and IG population and their owners' satisfaction. Here, we present preliminary data about interspecific social behaviours observed by owners.

Methods

An online survey was advertised using social media and a virtual snowball sampling method was applied. The questionnaire was divided into 10 sections. 11 multiple-item questions collected information about dog attitudes using a 10-point Likert scale and social behaviour using a 5-point Likert scale. Descriptive statistical analysis and explorative inferential analysis were performed.

Results

We collected information about 97 IGs and 129 Whippets. Mann-Whitney U tests ($P < 0.05$) found no significant differences between breeds for aggression and fear towards both familiar and unfamiliar people, and separation distress. IGs obtained higher rates in shadowing ($Z = -2.2$, $P = 0.02$), laying in contact ($Z = -4.9$, $P < 0.001$) and soliciting interactions with familiar people ($Z = -3.9$, $P < 0.001$).

Conclusion

Our data pointed out some differences between whippets and Italian Greyhounds in social behaviour towards humans, with IGs showing a stronger need of visual or physical contact with familiar people.

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The use of sertraline in dogs presenting compulsive behaviour: a four-case series

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Compulsive behaviours are a behaviour problem presented in human and non-human animals that significantly impairs their welfare. In companion animals, it can be presented as self-mutilation, stereotypic or hallucinogenic behaviours (Overall, 2013). Regarding its treatment in human psychiatry, selective serotonin reuptake inhibitor (SSRI) like sertraline and escitalopram are already documented and used in obsessive-compulsive disorder treatment (Mowla et al., 2018), with some authors recommending sertraline or fluvoxamine as first-line prescribed psychopharmacological therapy (Choi, 2009).

Regarding dog's compulsive behaviour treatment, fluoxetine (Irimajiri et al., 2009) and clomipramine (Seksell and Lindeman, 2001, Seksell and Lindeman, 1998) have already been reported as giving significative results, but clinical reports of other SSRI are still lacking in veterinary medicine. Sertraline appears to be a safe alternative presenting fewer side effects than fluoxetine and clomipramine (Crowell-Davis et al., 2019), so we decided to use it for the treatment of dogs presenting with compulsive behaviour problems.

Four dogs from 18-60 months of age diagnosed with anxiety and compulsive behaviours (three presenting acral-lick dermatitis and one presenting tail chasing) were selected. Beside behaviour modification techniques and environment management tools, they were each prescribed a combined treatment with a baseline anxiolytic for continuous anxiety control (lorazepam, 0,15-0,25 mg/kg, q12h; clonazepam, 0,24 mg/kg, q12h) and a SSRI (sertraline, 0,78-2 mg/kg, q12h). All dogs showed reduced anxiety and almost ceased compulsive behaviours in the first week of treatment, without showing sedation, and consequent improvement of dermatological lesions.

This case series seems to show that the combination of sertraline and benzodiazepines may be beneficial for the treatment, but further studies are necessary to demonstrate their effectiveness on the treatment of compulsive related behaviour problems.

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Improvement of the quality of life in four dogs with intracranial pathology after ethological treatment

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No conflict of interest to declare

Four dogs with intracranial disease and associated behavioural problems were evaluated by the Ethology service of the Rof Codina University Veterinary Hospital because they showed some dysfunctional behaviours (aggression, compulsive disorders, difficulty learning or remembering commands or places, disturbance of restful sleep, house soiling, fears and phobias, onset of separation anxiety), that disturbed the owners greatly and decreased the animal's quality of life.

In both humans (Madhusoodanan et al. 2007; Madhusoodanan et al. 2015) and dogs (Menchetti et al. 2019; Foster et al. 1988) it has been seen that intracranial neoplasms can cause behavioural disturbances, although it is rarely the main clinical sign (Madhusoodanan et al. 2007) and it is difficult to know exactly what changes occur. These behavioural changes are seldom supplemented by specific treatment, and the benefit of the use of certain psychopharmaceuticals for treatment has been questioned (Rooney and Grant, 2013; Caudill et al. 2011).

In our case, the underlying conditions included pituitary mass, ex vacuo hydrocephalus secondary to skull fracture, large extra-axial mass in the area of the frontal and olfactory lobe (suspected meningioma), and supratentorial intra-axial neoplasm in the right hemisphere (suspected glioma). In addition to neurological treatment, complementary ethological treatment was administered, appropriate for each case. This focused on a strict routine, environmental and cognitive enrichment, avoiding punishment, and the use of benzodiazepines. For all dogs, the quality of life was greatly improved.

The results of this study support considering ethological treatment as part of multimodal therapy in dogs with behavioural changes due to an intracranial organic cause. Veterinarians in different fields must work as a team to be able to solve all kinds of animal pathologies (Christiansen and Forkman, 2007).

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Understanding the relationship between pain and behaviour in clinical behaviour practice

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Definition of pain

The International Association for the Study of Pain (IASP) recently proposed a new definition of pain, as “An aversive sensory and emotional experience typically caused by, or resembling that caused by, actual or potential tissue injury” (IASP website). Importantly this definition and the accompanying notes highlight the following:

- pain is usually an adaptive response even though it may impact on the functioning of an individual;
- pain and nociception are not the same;
- pain is always a subjective experience influenced by biological, psychological, and social factors;
- an individual’s expression of pain (which does not need to be verbal) should be accepted and respected (and while the IASP refer to people in this regard, I would suggest the same standard should be applied to non-human animals).

Accordingly, it is imperative that we understand the relationship between pain and behaviour in clinical behaviour practice.

Pain as an affective system with complex effects on cognition and behaviour

Panksepp (2011) describes pain as a “sensory affect” rather than affective system, but this seems to be based on a focus on the relatively simple relationship between reflexive responses and acute pain; however, behavioural responses to pain can be much more complex and I suggest, they indicate that pain so can the interrelationship between pain and behaviour in clinical behaviour practice

meet his defining criteria for an affective system, namely:

- Pain is triggered by biologically significant unconditional stimuli, and the associated networks in the brain have a genetic basis
- These networks organise behaviour, through the regulation of autonomic, hormonal and motor subroutines
- There are clearly changes in the sensitivity of a wide number of sensory systems as a result of pain
- Painful arousal results in activity that feeds back on itself and outlasts precipitating circumstances
- The networks in the brain associated with pain can be associated with, and thus come under the control of conditioned stimuli
- There are associations between pain networks and other higher cognitive brain functions.

The relationship between pain and behaviour, like the relationship between affective systems and cognition, is clearly bidirectional, i.e. pain affects behaviour and behaviour can also affect pain. Indeed, in the case of animals under human care, the relationship can be extended to include the behaviour of the carer, since their behaviour may affect both the perception of pain by the animal and its pain. This is further evidence of how pain networks in the brain can be affected by higher cognitive processes. Accordingly, we must recognise that the relationships that exist between pain and behaviour can be highly complex. It must also be acknowledged that while many

potential relationships between pain and behaviour are suggested, it is difficult to present definitive evidence of these. However, given the guidance of IASP to accept and respect expressions of pain, which can be non-verbal, we should be open to at least provisionally accepting these relationships, until it can be shown otherwise. Accordingly, veterinarians should be open to the implementation of pain management strategies in cases of problem behaviour; accepting that the relationship may not be an obvious one, and that there is enormous variability between individuals.

A framework for describing the relationships between animal behaviour and pain in clinical behaviour practice

A recent review by Mills et al., (2020) has argued that the relationship between the problem behaviour and pain, beyond the well-recognised signs of pain, can be described using four categories:

1. the presenting complaint is a direct manifestation of pain (acknowledged or not). We describe a range of “atypical” or perhaps “less typical” manifestations of pain in this regard.
2. unidentified pain is underpinning secondary behaviour concerns within the initial presenting complaint. In this instance, problems other than those making up the primary presenting complaint are identified as related to pain, and need to be managed as they contribute to the “problem load” posed by the patient to others.
3. there is an exacerbation of one or more signs of problem behaviour as a result of pain;
4. incidental adjunctive behaviours accompanying the problem behaviour are associated with pain (whose presence may help the recognition of a contribution by pain to the problem behaviour in 1-3 above).

Awareness of these relationships and a wider potential range of manifestations of pain, have increased the proportion of problem cases which we identify as appearing to involve some form of painful lesion. Indeed, the figure has now risen to >80% of our current referral load. This awareness has also changed our approach to treatment, greatly increasing the use of pain-management strategies in our clinical behaviour caseload. Such interventions are often implemented alongside risk management strategies as a first line, prior to the use of conventional behaviour modification protocols.

Conclusion

We accept that the actual mechanism underpinning the association between pain and problem behaviour may never be known in a given case, but I suggest that, in general, it is better for veterinarians to treat suspected pain first rather than consider its significance only after an animal has failed to respond to behaviour therapy. We need to be pro-active in our consideration of the relationship between pain and behaviour in clinical behaviour practice.

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A preliminary study on preparedness in veterinary behavioural medicine among veterinary students in the United Kingdom.

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Veterinary behavioural medicine (VBM) is a foundation subject that is widely incorporated within the veterinary curriculum to produce competent and confident veterinarians. As custodians of the animal's health and welfare, veterinary professionals are at the forefront of providing behavioural advice to clients. However, veterinary students have reported to be less prepared in VBM than they do in other areas of the course. This preliminary study aims to assess preparedness for behavioural medicine amongst veterinary students in the United Kingdom. An online 7-point Likert scale questionnaire with 56 questions was used to explore student confidence, curriculum content and technical knowledge in behavioural medicine. Seventy one participants from 7 schools responded to the questionnaire. Our findings indicated that, 91.4% of veterinary students in the UK did not feel prepared to treat an animal with behavioural disorders. As predicted, students were more prepared as they reached the final year. However, only 37.5% of these students felt prepared to formulate a behavioural treatment plan. Using a Spearman's rank correlation coefficient, there was a positive correlation in the learning gained from behavioural medicine content in the curriculum that translated into students feeling prepared to manage behavioural cases ($r=0.603$). Our findings indicate there is a need for more evaluation of course content within the curricula to better prepare students to manage emotional health disorders. The challenge is integrating this subject in an already complex and packed curriculum. A necessity for standardisation of how VBM is being taught has been recognised in the veterinary curriculum. This study achieved ethical approval from the Faculty of Health and Medical Sciences, University of Surrey (FT-1819-163).

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Impact of living conditions on repetitive behaviours in dogs.

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No conflict of interest to declare

Repetitive behaviours are classified as stereotypies or compulsive-obsessive behaviours depending on authors (Overall 1992, Low 2003, Luescher 2004, Tynes 2014). Causes are multifactorial (Mason and Latham, 2004), but living conditions are often cited as major risk factors in farm animals. Therefore, repetitive behaviours in dogs might be correlated with poor living conditions as well.

The objective of this preliminary work was to explore the influence of living conditions on the frequency of repetitive behaviours in dogs. Fifty dog owners were recruited to fill out a questionnaire in the vaccination waiting room, and during behavioural medicine consultations, at the veterinary university hospital of Alfort (ChuvA). Their living conditions were explored using a newly developed 20-point welfare scale (0 = poor welfare, 20 = good welfare). The owners were asked in the questionnaire if their dog presented any repetitive behaviour. Twenty five dogs were healthy, and 25 dogs presented repetitive behaviours such as spinning, excessive paw licking, masturbation, and pica. This study did not involve any handling of animals, and thus did not require an ethical sign off by the supervising institution.

The 25 dogs presenting repetitive behaviours had a mean welfare score of 11.6 ± 2.6 , while the mean score of the 25 healthy dogs was of 14.4 ± 2.3 , significantly different (Mann-Whitney test, $F(49) = p < 0.001$). Moreover, a Pearson correlation test showed a negative correlation between the welfare score and repetitive behaviours ($r = -0.35$, $p < 0.00003$). Dogs presenting repetitive behaviours had a significant lower welfare score compared to healthy dogs.

Therefore, hypothesis based on repetitive behaviours in dogs linked with poor living conditions could be endorsed. A welfare score could be a useful tool for assessing and improving living conditions of dogs presenting with repetitive behaviours.

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The effect of two anxiolytic drugs on learning in dogs: Preliminary findings.

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No conflict of interest to declare

Introduction

Some anxiolytic medications, particularly benzodiazepines, can negatively impact memory and learning. In human beings, drugs such as dexmedetomidine seem to interfere less with learning processes. However, no studies have tested the effects of different drugs in dogs. In veterinary behavioural medicine, in many cases it would be best to be able to choose a drug that doesn't interfere with learning-based behaviour modification programmes. This study was designed to compare the effects of alprazolam and dexmedetomidine on memory in dogs.

Methodology

A total of 17 laboratory beagle dogs from the Veterinary Teaching Hospital at Cardenal Herrera, CEU University were included in the study (which was authorised by the ethical committee of the university).

Dogs were allocated into 3 groups: Group 1 didn't receive any drug, and groups 2 and 3 received Alprazolam (0.05 mg/Kg, 1 hour before the testing session) and Dexmedetomidine (Sileo®; Ecuphar), 30 minutes before the testing session respectively.

The test was based on a discrimination task in which the dogs had to learn to discriminate between three objects, one of which was the target (a star). When the dog chose correctly the first time, it was reinforced and counted as a success. If the first choice was incorrect, the dog was redirected toward the correct one, and then reinforced if it made a correct choice (this response was counted as "assisted"). If the dog failed to redirect to the target or didn't explore, it was counted as a failure and it was not reinforced.

The dogs did 10 trials each day until the learning phase was completed, which was classed as when at least 80% of choices were correct first time on two consecutive days (learning criterion).

There was then a second "learning-loss" phase during which dogs continued to perform the same task, but without redirecting any errors. A dog was considered to have forgotten the task when its first-choice correct rate was less than 33% on two consecutive days (learning-loss criterion).

The daily total number of correct, assisted and incorrect trials, the number of days to reach the learning and learning-loss criterion were compared between groups using appropriate parametric and non-parametric analysis (ANOVA). Projection to latent structures discriminant analysis (PLS-DA) was used to compare all daily data (correct, assisted and incorrect) for days 2-5 between the groups.

Results

There were no statistically significant differences between groups at any time point, or for the number of days to reach the learning or learning-loss criteria using appropriate parametric or nonparametric ANOVA tests.

PLS-DA was able to identify a pattern difference that could discriminate between groups using the data collected from days 1 to 5 of the learning phase of the study ($R^2Y=0.294$ $Q^2=0.198$, $p=0.033$), but no model could be created for the learning-loss phase. The key feature of the learning acquisition model was that group 3 (Dexmedetomidine) was positively associated with the number of first-time correct responses on days 2, 3 and 5 and negatively associated with the number of incorrect responses on those days. The opposite was true for Group 2.

Conclusions

This preliminary study suggests that Dexmedetomidine may interfere less with memory and learning than Alprazolam, which might make it the preferred before a behaviour modification session.

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Management of stress during international air travel in 4 cats – a case series

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No conflict of interest to declare

Over 2 million pets and other live animals are transported by air every year in the United States alone (US Department of Transportation, 2020). There has been no published data on the impact of air travel on stress in cats, however a study investigating physiological signs and behaviour of dogs during air transport concluded that air transportation is stressful for dogs (Bergeron et al., 2002). Some of the main causes of stress in cats include environmental changes and lack of control and predictability (Amat et al., 2015), all of which occur during air transportation and may negatively impact welfare (Amat et al., 2015).

This case series describes stress management protocols in 4 owned pet cats before, during and after air travel. All cats were relocated from the United Arab Emirates to their owners' home countries, one cat to Australia and 3 cats to the United Kingdom. All 4 cats showed signs of stress during veterinary procedures in preparation for travel, which made handling difficult and gave serious concern for the cats' welfare during air travel. Therefore, stress management protocols compliant with airline regulations were designed and implemented for each cat; these included travel crate familiarisation, pheromone products, alpha-casozepine, gabapentin and environmental measures in the new homes.

Despite lacking evidence that air transportation is stressful for cats, research in other species and current knowledge about stress in cats indicate that this is likely the case. The intention of this case series is to raise awareness about the challenges of feline air travel and to suggest the importance of safe, airline compliant stress management protocols to safeguard cats' welfare.

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Demographics, personality, and relationship with owners affected pets' quality of life during COVID-19 lockdown

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COVID-19 caused unprecedented global lifestyle changes, with unknown effect on cats' and dogs' quality of life (QoL). QoL is a multidimensional measure reflecting physical, emotional, social, and environmental health.

During the first wave of COVID-19 we investigated the role of lockdown, personality, and human-animal relationship on the QoL of 242 pets (Ncats=78, Ndogs=164) via an international online survey. Personality was measured using two personality scales based on Reinforcement Sensitivity Theory, one for the humans (Corr & Cooper, 2016) and one for the pets (Piotti et al., 2018). QoL was measured in humans using the WHO-Bref scale (WHOQOL, 1998), while in cats and dogs we produced a novel scale based on the four WHO domains (physical, emotional, social and environmental). We measured pet-owners relationship using the LAPS scale (Johnson et al., 1992). The survey also included demographic and COVID-19 related questions. Novel questionnaires' structures were confirmed by Exploratory and Confirmatory Factor Analysis; ordinal regressions were used to examine the effects on QoL domains.

Age and personality had an effect on the physical domain, which had lower scores in older animals ($\beta_{\text{QoLmidAge-Old}} = -0.74$, $p = 0.028$) and decreased as trait avoidance increased ($\beta_{\text{QoLavoidance}} = -0.36$, $p = 0.007$). The emotional domain was affected by the species, age, time of adoption and personality: it had lower scores in dogs compare to cats ($\beta_{\text{QoLCat-Dog}} = -0.84$, $p = 0.002$), in older animals ($\beta_{\text{QoLmidAge-Old}} = -0.99$, $p = 0.001$), and in those adopted early ($\beta_{\text{QoLearly-later}} = -0.75$, $p = 0.007$); on the contrary, higher trait approach increased the emotional scores ($\beta_{\text{QoLapproach}} = -0.68$, $p = 0.001$). The Social domain was negatively affected by the owners' lockdown-related financial loss ($\beta_{\text{QoLno loss-loss}} = -0.60$, $p = 0.029$). Finally, the safety-related environmental domain was affected by the species and the pet-human relationship: dogs had higher scores than cats ($\beta_{\text{QoLCat-Dog}} = 1.29$, $p = 0.001$) and the scores increased in owners that saw their pet as people substitutes ($\beta_{\text{QoLsubstitute}} = 0.07$, $p = 0.006$).

The pets' social support was mostly affected by owners' related factors, such as lockdown-related financial loss. On the contrary, there was no evidence of a role of the lockdown measures on physical, emotional, and environmental health, which were mostly affected by pet-related factors, such as age, species, early experiences, and personality.

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Case report: Noise and thunderstorm sensitivity in a dog with chronic pain.

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Frida a 6-year-old, 35 kg, female neutered, Irish Setter was presented for fear of loud noises and thunderstorm sensitivity, which had suddenly manifested itself two months earlier. Frida also displayed avoidance and hypervigilance in those places linked to the loud noises and aggressive behaviours toward unfamiliar dogs and people. During the behavioural visit, the dog showed stiffness in her hind legs when walking and her owner pointed out that Frida was tending to sleep more than before.

The link between pain and fear-related problems is well recognized in humans and pets (Dodd et al., 2020; Elman and Borsook, 2018; Khan et al., 2020; Lindley, 2012; Mills et al., 2020); in dogs, Fagundes et al., (2018) explored the association between noise sensitivity and musculoskeletal pain.

Frida's diagnosis was noise/thunderstorm sensitivity and territorial aggression. X rays, orthopaedic examination and neurologic examination, run by a ECVN Diplomate, diagnosed osteoarthritis in the hip and lumbar-sacral spondylosis. Behavioural modification and safety measures were advised, and Gabapentin was prescribed, with the addition of Dexmedetomidine hydrochloride before thunderstorms, the latter being then replaced with Trazodone. After 2 months, the owner reported that Frida's fear of noises was almost resolved and that she displayed less fearful behaviour during thunderstorms.

In this case, even in the absence of other more specific clinical signs, noise and thunderstorm sensitivity could indicate a painful condition. This underlines the importance of looking for hidden pain and the added value of collaboration between consultants to improve the overall health of companion animals.

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Bengal and Savannah hybrid cats: do they behave differently to other domestic cats?

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Hybrid cat breeds are more and more common in France, in particular the bengal, cross-bred with the wild leopard cat, or, to a lesser extent, the savannah, cross-bred with the wild serval. Here we question the abilities of these hybrid cats, with wild origins, to adapt to our urban environment. Our objectives were to explore whether these hybrid cats might express specific behavioural problems, compared with domestic cats.

We used an 88-items questionnaire to investigate the cats' behaviour and environment. This was filled out by owners from April 2015 to January 2016, via an App freely available thanks to the Cité des Sciences (Paris), and through social networks for bengal and savannah owners (June to August 2019). Results from bengal (n=57), savannah (n=57) and other breeds cats (n=5677) were compared using Chi2 tests and t-tests. This study did not involve any handling of animals, and thus did not require an ethical sign off by the supervising institution.

Bengal and savannah cats in our study were significantly less fearful (fearful rates of 1.16 and 1.02 respectively) than cats of other breeds (1.62), across various situations that can cause fear or stress ($p < 0.05$). Bengal cats showed less aggressiveness towards humans (aggressiveness rate of 0.0086) than cats in the savannah (0.314) or other breeds (0.316) groups ($p < 0.05$). This finding differs from previous results in the literature. Bengal and savannah cats were more likely to chase shadows or lights (77.3% and 85.5% respectively) than cats of other breeds (67.5%) and meowed more (77% and 66% versus 49% for cats of other breeds). In addition, savannah cats exhibited more urinary marking behaviour (16.7%) than bengal (9.1%) or cats of other breeds (4.8%) ($p < 0.05$).

Savannah cats knew more instructions (62.5% knew more than 4 orders) than bengal (24%) or cats of other breeds (21%) ($p < 0.05$). Bengal and savannah cats were provided significantly more toys (98% and 92.9% respectively had more than 3 toys compared to 63% of cats from other breeds) but they had less frequent free or on-demand access outside (12% and 12.7% respectively) compared to cats of other breeds (41.5%).

Cats from other breeds seemed to be more adapted to their environment as they presented fewer behavioural problems than cats from the bengal and savannah breeds. Therefore, more studies are needed to explore the adaptation of these hybrid cat breeds to our urban way of life.

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The cage as an educational and therapeutic tool for dogs: results of a dog owners' questionnaire enquiry

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Introduction

This study aims to give an instant picture of dogs caged for educational or behavioural disorder and its outcomes (Polgár et al., 2019)(Skånberg et al., 2018).

Methodology

A 48 question enquiry was sent through social networks. In addition of the dog details, the enquiry determined the proportion of caged dogs in the population studied. Then inside the caged population the enquiry focused on the reasons why the dog is caged, the duration and the outcomes in terms of behaviour's improvement, worsening and general welfare.

Ethical approval was not required since the study was an owner questionnaire-based study.

Results

One thousand three hundred and five answers were gathered from 23 countries. Three hundred and thirty two owners (25.4%) declared that they use or used a cage for training or for behavioural reasons. Two hundred and sixty nine (81%) dogs were less than 1 year old (average 4 month) when closed for the first time. 67.7% of the dogs are caged between 5 to 7 days a week. 77% of the dogs were caged for less than a year. The most frequent signs of distress are crying (23.8%), trying to escape (19.6%), barking (16.8%).

Within the 332 caged dogs 6 educational goals and 4 behavioural disorders were explored. The outcome in terms of behaviour's improvement is significantly better for educational goals than for behavioural disorders (Fisher's test, $p=2.11 \times 10^{-6}$).

Conclusion

Caging a dog is still widespread in our studied population mainly for educational purposes and for a limited time. When the cage is used to solve behavioural disorders, the results are significantly worse than for educational purposes. Overall, the reported proportion of dogs showing distress when caged stays low.

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Case report: Aggressive behaviour in an older dog allowed us to assess her “overall” health.

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Luna a 12-year-old, 18 kg, female neutered mongrel was presented for aggressive behaviour towards the cohabiting dog, a 1-year-old, 30 kg, female, Golden Retriever. The behavioural visit also revealed aggressive behaviour towards unfamiliar dogs, familiar and unfamiliar people, attention-seeking behaviours, and reluctance to move. Luna showed several signs of clinical anomalies as well, but they were all put down to the normal aging process by owners.

Owners' awareness of clinical and behavioural problems in older dogs is lacking and they are mostly left unreported (Landsberg et al., 2011). Monitoring of symptoms can aid in assessing the diseases as well as the pet's quality of life and their emotional state (Cockburn et al., 2018). Cushing Syndrome, arthrosis and musculoskeletal pain were diagnosed in Luna. A correlation between these diseases and aggressive behaviour, noise sensitivity, anxiety and cognitive changes have been reported in literature (Barcelos et al., 2015; Dodd et al., 2020; Fagundes et al., 2018; Horowitz, 2015; Mills et al., 2013, 2020).

Generalized anxiety, fear of noises, possessive and pain related aggression have been diagnosed with anxiety, pain, frustration and fear being the emotions involved. Gabapentin, Grapipant, Trilostane and advice concerning providing a safe haven, resource management, use of a leash/fence, mental stimulation and provision of chews were provided to improve her condition.

The manifestation of the aggressive behaviour led us to look into all aspects of the dog's medical/mental health. It is our responsibility as veterinarians to take a proactive and complete approach when striving for successful aging in dogs.

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A Canine Food Reaching Task (CanFoRe): A New Tool to Assess Paw Preference in Domestic Dogs

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Functional cerebral asymmetry (FCA) refers to the functional specialization of right and left hemispheres of the brain in performing certain motor tasks. As stress may affect FCA, paw preference, which is an observable measurement of FCA, is suggested as a promising stress parameter in dogs [1, 2]. Kong test (KT) is a standard method for determining paw preference in dogs [2, 3] although the reliability of the KT is highly controversial [4]. Therefore, in this study, we aimed to develop a new and reliable method, i.e. Canine Food Reaching Task (CanFoRe) for evaluating FCA in dogs as an alternative to the KT.

We tested the CanFoRe on 44 dogs in two different situations, i.e. home and acute stress situation, i.e. open field test with novel object. Most of the dogs (84 %) used their paws on the CanFoRe both in home environment and in an acute stress situation. On the other hand, although the majority of the dogs used their paws in the home environment during the KT, only 57 % of them manipulated the Kong toy with their paws in an acute stress situation. Considering the dogs' interests in both tests, in an acute stress situation, a statistically significant difference was found between CanFoRe and KT (Wilcoxon test, $p \leq 0.05$). Dogs showed more interest in the KT in home environment compared to the acute stress situation (Wilcoxon test, $p \leq 0.05$).

This study is the first to design a food reaching test for dogs. Preliminary results showed that CanFoRe is an applicable test for evaluating paw preferences of dogs. Moreover, it can be used for measuring paw preferences of dogs under an acute stress situation. Thus, we suggest CanFoRe as a promising tool to become a new method for further studies.

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Correlation between serotonin and tryptophan serum concentrations in shelter dogs undergoing a stressful procedure

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Low levels of serotonin (5-HT) have been linked to emotional disorders in dogs (León et al, 2012, Amat et al, 2013). Although it is known that tryptophan (TRP) may increase serotonin levels in the brain, the relationship between TRP and 5-HT concentrations in the blood remains unclear (Gazzano et al, 2019).

The study was approved by the Ethical Committee of the University of Pisa (protocol n. 35/2018), in accordance with Directive 2010/63/EU. Experimental subjects were 39 shelter dogs, 15 females and 24 males, their age ranging from 7 months to 14 years (mean age=5.6 years). They had lived in the shelter for at least 1 month and were in good health. All dogs underwent a blood sampling procedure, during which they were categorized by an expert according to their behavioural response. Categories were: relaxation, stress signals, tension without growling, tension with growling, escape attempts, and aggression attempts. The evaluation of blood 5-HT and TRP was performed using a HPLC method. Data were statistically analysed applying Chi-square and Spearman tests.

Statistical analysis revealed no significant difference in TRP ($\chi^2=2.084$, $p=0.555$) nor 5-HT ($\chi^2=0.972$, $p=0.808$) serum concentrations among groups of dogs belonging to different categories; however, it must be stressed that the distribution of dogs was uneven, with some categories being underrepresented (relaxation=20.5%, stress signals=30.8%, tension without growling=43.6%, tension with growling=5.1%, escape attempts=0%, aggression attempts=0%). Furthermore, no correlation between TRP and 5-HT serum concentrations was found ($\rho=0.086$, $p=0.602$).

Serotonin serum levels do not seem to be associated with a dog's behavioural response to a stressful situation nor with the serum concentration of its precursor, tryptophan. Further research is needed to clarify the relationship between these two molecules' concentrations in the blood.

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