The role of exercise and human contact for reducing stress in shelter dogs

David José Menor-Campos, Jose María Molleda-Carbonell and Rocío López-Rodríguez.

Department of Medicine and Animal Surgery. Faculty of Veterinary Medicine. Rabanales University Campus. Córdoba E-14014, Spain
e-mail: pv2mecad@uco.es; molleda@uco.es; pv1loror@uco.es

Summary

Placement in shelters causes stress in dogs due to restricted mobility, isolation, new surroundings or noise (Hennessy et al. 1997; Sales et al. 1997; Tuber et al. 1999). Moreover, the animals that are relinquished to facilities of this kind have usually suffered from previous stress due to neglect or abandonment, the loss of places and people they know, or rejection by their owners (De Palma et al. 2005).

Shelter stress in these animals can be the cause of abnormal behaviour as well as changes in animal physiology (Beerda et al. 1999). Physiological changes can involve the release of cortisol due to hypothalamic-pituitary-adrenal axis (HPA) activity, which is considered a sign of stress in most mammals, including dogs (Kirschbaum and Hellhammer, 1989). The determination of salivary cortisol has been used previously in dogs as a non-invasive technique to evaluate both acute (Beerda et al. 1998) and chronic stress (Beerda et al. 1999, 2000).

This study investigates the effects on canine stress of 25-minute sessions of exercise and human contact. With this aim, we determined cortisol levels in saliva by EIA using the SALIMETRICS commercial kit (Salimetrics, LLC. 101 Innovation Blvd., Suite 302, State College, PA 16803, USA) in 37 dogs housed in the municipal animal shelter of Cordoba, Spain. The animals were randomly assigned to an experimental group (EG), which was subject to two 25-minute exercise sessions in an outdoor fenced area on days 7 and 9, or a control group (CG). Samples were taken on days 7, 9 and 10 following placement in the shelter. The EG dogs were subject to exercise sessions on days 7 and 9. On day 10 the dogs were administered a behavioural test at which time an additional sample was taken.

The results confirm that 25 minutes of exercise and human contact over just two sessions reduces stress in dogs placed in shelters. This should encourage these centres to implement dynamic programmes involving exercise and human contact that can be short in length and few in number due to staffing limitations and the lack of resources.

Approach and Results

Experimental Group

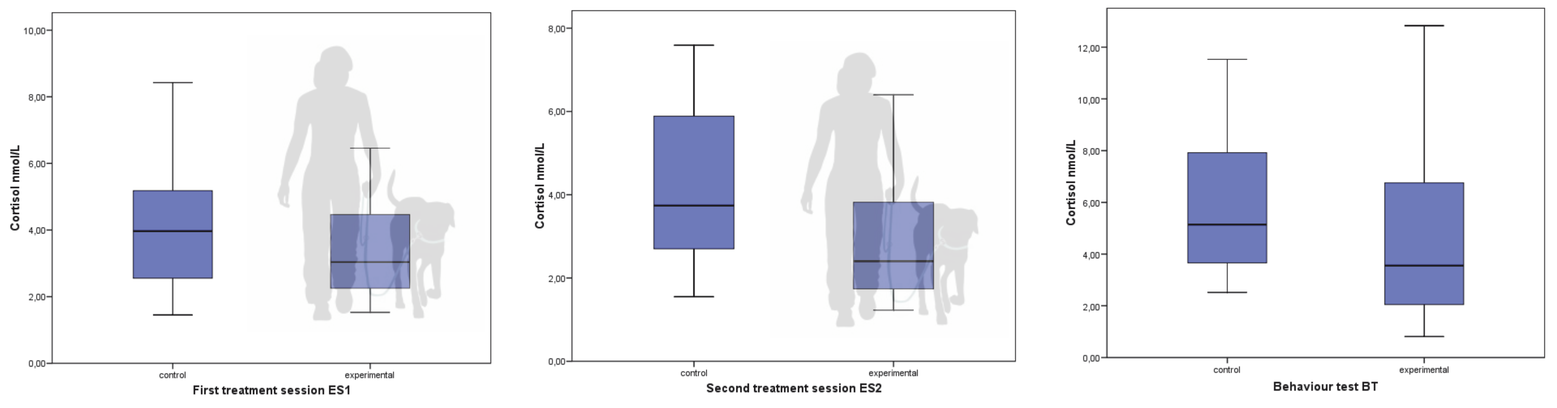
37 dogs housed in individual cages

Municipal shelter Córdoba, Spain

Control Group

Treatment

Day 7 and 9. Walk on a leash to an outdoor fenced area; let loose; play with a ball; run alongside the person accompanying them; basic commands; walk on a leash.
Total duration: 25 minutes approximately.



Cortisol concentration values in saliva following the exercise sessions for the EG or in the cages for the CG (First treatment session ES1 on day 7; Second treatment session ES2 on day 9) and the behaviour test (BT). "Control" refers to control group (CG); "Experimental" refers to experimental group (EG).

Salivary cortisol analysis

Saliva was collected following the protocols developed by Kobelt et al. (2003) and Chacon (2004), in the morning hours. Salivary cortisol was determined in duplicate by means of enzyme immunoassay (EIA) (Salimetrics, SLL. 101 Innovation Blvd., Suite 302. State College, USA) following the manufacturer's instructions.

Results

Cortisol levels in the dogs of the experimental group decreased with exercise. Both the within-subjects factor "day" ($F = 7.98$, $P < 0.01$) and the between-subjects factor "group" ($F = 121.422$, $P < 0.05$) influenced cortisol levels. The pairwise comparison of the mean daily cortisol levels revealed a significant increase in cortisol after the behaviour test compared to the other two days ($P < 0.05$), and that cortisol in saliva was higher in the CG ($t35 = 1.711$, $P = 0.096$). Moreover, significant differences between groups on the second day ($t35 = 2.53$, $P = 0.016$) were observed.

Day	Control Group	Experimental Group
ES 1	4.22 ± 1.97 nmol/L	3.53 ± 1.59 nmol/L
ES 2	4.3 ± 1.98 nmol/L	2.84 ± 1.48 nmol/L
BT	8.18 ± 7.71 nmol/L	4.76 ± 3.63 nmol/L

Mean values and standard deviation of cortisol in saliva. ES1 = day 7 following the exercise sessions for the EG or in the cages for the CG; ES2 = day 9 following the exercise sessions for the EG or in the cages for the CG; BT = day 10 after behaviour test.

Discussion

Stress due to placement in a canine shelter can lead to behavioural problems (Hubrecht and others 1992; Beerda and others 1999a; Hiby and others 2006) which may be an impediment to adoption (King and others 2009) or cause owners to return animals to the shelter (Marston and others 2005).

The human contact and exercise sessions described in this study reduced cortisol levels in dogs housed in shelters. After just two exercise sessions these differences were found to be significant as cortisol levels remained constant in the dogs who did not participate in exercise sessions, but decreased significantly for those that did.

Furthermore, the use of behaviour tests as an additional stimulus has revealed differences in physiological response among the dogs in both groups. Specifically, the dogs in the control group had extremely high levels of cortisol compared to the dogs in the experimental group, suggesting that they have a lower tolerance to new stimuli. It has been demonstrated that animals subjected to chronic stress may have relatively low cortisol levels, due to the negative feedback of cortisol in the HPA axis. However, exposure to a new stressor leads to a greater increase in cortisol than if they were not under stress. In other words, exercise sessions, play and human contact decrease chronic stress levels in dogs, while increasing their tolerance to new stimuli.

The test has also revealed how canine behaviour evolves. Specifically, we found that exercise, play and human contact leads to lower cortisol levels and better test scores, and hence improves the behaviour of the dogs in the experimental group.

Main conclusions

25 minutes of gentle exercise, play and human contact were successful in reducing stress in dogs placed in canine shelters, and improving behaviour. Those are simple and cost-effective practices to implement in shelters normally affected by budget and staffing constrainsts.

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