Effect of breed on thermal pain sensitivity in dogs

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Abstract

A problem in assessing pain sensitivity in animals is the variability among individuals within a species. Thermal nociceptive threshold (TNT) testing is used to measure pain sensitivity in animals. However, little research has been done on within species differences in pain sensitivity, with most studies focusing on the effectiveness of analgesics. This research was carried out to see if there was any variation in baseline TNTs in different dog breeds.

To determine TNTs, a heat stimulus was applied to the leg of a dog using a new device that could be remotely activated. This removed the need to restrain the dogs. The time and temperature at which the dog responded behaviourally was recorded. The TNT of dog was recorded six times in a one-hour session, once a week, for four consecutive weeks.

In the first experiment the repeatability of harrier hound (n= 11) TNTs over time and the effects of the initial thermode temperature were examined. The results indicated that TNTs were repeatable over the daily test, session however they were affected by week of testing, thermode and initial thermode temperature. It was concluded that using a consistent elevated initial thermode temperature was more consistent than the natural starting temperature.

The aim of the second experiment was to investigate differences in TNTs between three dog breeds: harrier hounds, greyhounds, and huntaways (n=10 per breed). A breed effect was found whereby huntaways took significantly longer to respond than harrier hounds and responded at higher temperatures than greyhounds and harrier hounds. There were no differences between greyhounds and harrier hounds. This study provides the first scientific evidence of breed differences in pain sensitivity in dogs.

It is concluded that there were differences in thermal pain thresholds between the three dog breeds tested. The study supported the use of TNT testing on dogs and offered new insight into ways to improve the reliability of threshold testing. Future work should use more breeds, evaluate pain sensitivity in other modalities, and assess the effect of analgesics on TNTs in dogs.

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