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Neurohormonal responses to human-animal and human-robotic dog interaction

Research shows that interacting with companion animals reduces humans' blood pressure, stress, and improves mood, believed to be rooted in neurohormonal changes. The extent to which responses occur with a robotic pet interaction is unstudied. The study tested effects of human-robotic dog interaction on human serum cortisol, comparing these effects with those from human-own dog or human-unfamiliar dog interaction. Participants completed questionnaires and health histories prior to venipuncture. Blood pressure was monitored every 5-minutes during quiet interaction in each condition. After a 10% blood pressure drop, the interaction stopped and venipuncture was repeated. Specimens were centrifuged at 0 degrees Fahrenheit, serum and plasma aspirated and frozen at -70 degrees Fahrenheit. Neurohormones were assayed via High Performance Liquid Chromatography (HPLC). The Wilcoxon Signed Rank test tested the null hypothesis of median changes in cortisol by group (live dog vs. robotic dog and own dog vs. unfamiliar dog vs. robotic dog). Thirty-nine females and 3 males aged 19-73 (37 pet owners, 5 non-owners) participated. Cortisol significantly decreased in all three conditions--most with the robotic dog (-246 median difference, $p=0.0005$) versus the own dog (-135.5, $p=0.003^*$) or unfamiliar dog (-179.5, $p=0.0074^*$). Robotic dogs may be as beneficial in reducing cortisol as interacting with one's own dog or an unfamiliar dog. Because robotic dogs require less care than live dogs, there may be situations in which they would be beneficial like elderly people unable to care for a live dog or severe asthmatics.