KISSPEPTIN: A CENTRAL REGULATOR OF REPRODUCTION IN THE BITCH

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Kisspeptin (KISS1) and its receptor (KISS1R) are essential for normal reproductive function in many species. However, the role of KISS1-KISS1R signaling in the dog is unknown. Aims of this study were to identify the canine KISS1 and KISS1R genes and to characterize the amino acid sequences of KISS1 and KISS1R. Subsequently the effect of kisspeptin on the hypothalamic-pituitary-gonadal axis in the dog was studied by performing KP10 (shortest biological active form of kisspeptin) stimulation tests using different doses of KP10.

Canine KISS1 and KISS1R genes were localized by comparing the reference dog genome build 2.2, with the relevant human cDNA sequences using BLASTn software. The predicted mRNA of preprokisspeptin encodes a peptide of 111 amino acids. The amino acid sequence of canine KP10 differs at positions 5 and 10 from human KP10. The predicted mRNA for the canine KISS1R encodes a protein of 382 amino acid residues. The amino acid sequences of the canine and the human kisspeptin receptor were 75% identical.

Canine KP10 was administered intravenously at weekly intervals to 6 adult Beagle bitches during anestrus using the following doses: 0 (control, NaCl 0.9%), 1, 5, 10, 30, 50, and 100 µg/kg per stimulation test. Blood samples were collected at -40 and 0 min before, and 10, 20, 30, 40, 60, 90 and 120 min after canine KP10 administration, for measurement of the plasma LH concentration. There was a significant increase in plasma LH concentrations after all administered canine KP10 doses, (Figure 1). There was no significant difference in LH response between the doses.

In conclusion, the KISS1 and KISS1R genes are present in the canine genome and intravenous administration of canine KP10 results in increased LH secretion. This strongly suggests that KISS1-KISS1R signaling plays a key regulation role in canine reproduction.

Figure 1. Median plasma LH concentrations after different dosages of KP10 administration (arrow).