

# **Local effect of progesterone infusion into ovarian artery on activin A and inhibin $\alpha$ -subunit secretion during the middle luteal phase in gilts**

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## **Abstract**

The present study was undertaken to elucidate whether an increased, but physiological, amount of progesterone (P4) supplied to the porcine corpus luteum affects luteal secretion of activin A and inhibin  $\alpha$ -subunit (Inh $\alpha$ ) in freely moving gilts. On day 9 of the estrous cycle (EC), both ovarian arteries and both ovarian veins of gilts (n=5) were cannulated. Progesterone was infused into the right ovarian arteries in gilts on days 10, 11 and 12 of the EC at a rate adequate to its physiological retrograde transfer found during the middle luteal phase of the EC. The P4 infusion rate was 0.62  $\mu\text{g}/\text{min}$  (day 10),  $2 \times 0.62 \mu\text{g}/\text{min}$  (day 11) and  $3 \times 0.62 \mu\text{g}/\text{min}$  (day 12). The left ovarian arteries were infused with saline (control). Blood samples were collected from both ovarian veins on days 10-12 of the EC before and after P4 or saline infusion. The mean plasma activin A level in the ovarian vein ipsilateral to the P4-infused ovary was higher ( $P < 0.0001$ ) on days 10-12 of the EC than this found in the contralateral ovarian vein. The level of activin A in the ovarian vein ipsilateral to the infusion of P4 was higher on days 11 ( $P < 0.01$ ) and 12 ( $P < 0.0001$ ) and tended to be higher ( $P < 0.07$ ) on day 10 of the EC than this in contralateral ovarian vein. The level of Inh $\alpha$  in the ovarian vein ipsilateral to the P4-infused ovary on days 10-12 of the EC was not significantly different ( $P > 0.05$ ) than this found in the contralateral ovarian vein. The results of the present study indicate that a local elevation of P4 concentration in blood supplying the ovary during the middle luteal phase of the porcine EC affects ovarian secretion of activin A. The effect of P4 on the secretion of activin A suggested the existence of a short regulatory loop of a positive feedback between P4 being retrogradely transferred into the ovary and the secretion of this peptide.

**Key words:** activins, inhibins, exogenous progesterone, local feedback