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An ultrasound-based model to study follicular dynamics in common marmosets

Follicular dynamics are essential for ovulation in primates. A conventional method to determine preovulatory period is the measurement of steroid hormones in invasively or non-invasively collected samples. However, laboratory analyses are time-consuming and the results only provide retrospective information. In contrast, ultrasonography represents a non-invasive alternative for immediate assessment of the reproductive situation. The present study intended to create an ultrasound-based calculation model for the estrous cycle management in common marmosets. Females (n=3, age 8-10 years) were monitored with MyLab™One (ESAOTE) at 8 defined time points throughout the cycle. Scanning was carried out in awake, unshaven primates using an 18MHz probe. Follicles, corpora lutea and endometrium were measured via special software (MyLab™Desk). Ultrasound results were compared with serum progesterone at 4 given times. Mean number of ovulatory follicles was 2 per animal, distributed on both ovaries. The mean increase in follicular volume from day 7 to day before ovulation (day 9-11) varied between 64.6% (right ovary) and 66.9% (left ovary). The follicular growth rate related to serum progesterone, as published elsewhere. Endometrial thickness decreased 0.4 percentage points from day 7 to periovulatory phase and then increased 13.6 percentage points to late luteal phase (day 22). Based on the results achieved to date, ultrasonography represents a reliable non-invasive tool to study follicular dynamics and to support reproductive technologies. Further research will focus on the establishment of an ultrasound-based calculation model, which enables a to-the-day precise cycle monitoring, and, moreover, the diagnosis of pathological variances in follicular dynamics.