ABSTRACTS

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Doppler ultrasonographic assessment of maternal and fetal arteries during normal feline gestation

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OBJECTIVES AND METHODS: The aim of this study was to describe resistance index (RI) of some pregnant cat arteries which have either controversial (1,2) or no previous reports i.e. uterine, umbilical, fetal abdominal aorta, fetal renal and fetal internal carotid. For this purpose, twelve, 1 to 4 years of age mixed-bred, pregnant queens were recruited. Color and pulsed-wave Doppler evaluations of uterine arteries (Toshiba Core Vision Pro, Japan, 8-MHz linear-array transducer) were performed every ten days from mating to parturition (defined as day 65; 3). Umbilical artery, fetal abdominal aorta, renal and internal carotid were assessed with the same frequency from their first detection up to parturition. To minimize variability, three uniform consecutive waveforms were recorded by a trained operator. Peak systolic velocity (PSV) and end diastolic velocity (EDV) were measured. Resistance index [(PSV-EDV)/PSV] was automatically calculated in all vessels (4). This study was approved by the Faculty Institutional Care and Animal Use Committee.

Data is shown as mean ± SEM. For each artery RI repeated measures ANOVA followed by Tukey test was carried out to evaluate the effect of time (SPSS 18.0; SPSS, Chicago, IL, USA). The level of significance was set on 0.05.

RESULTS: Ultrasonographic evaluations were successfully performed in all the queens in periods no longer than 30 minutes. None of the animals in this study delivered via C-section or presented dystocia. Resistance index of uterine artery decreased in the course of the study from day 20 onwards (P<0.01). On that day, RI was 0.438 ± 0.01 and on day 60 it was 0.337 ± 0.00 (P<0.01). Resistance index of umbilical artery also diminished progressively during pregnancy (P<0.01). On day 30, this parameter showed a value of 0.963 ± 0.01, and on day 60 it fell up to 0.738 ± 0.03 (P<0.01). Fetal abdominal aorta (P<0.01), renal (P<0.01) and internal carotid (P<0.05) arteries also diminished their RI from days 30, 50 and 60, respectively. Fetal renal artery was first detected on day 35, while fetal internal carotid was first observed on day 40. On day 60, fetal renal and internal carotid arteries had RI values of 0.792 ± 0.04 and 0.631 ± 0.02, respectively.

CONCLUSION: Resistance index of uterine arteries decreased in the course of normal gestation. This result is in line with a previous description of uteroplacental arteries in this species (1). However, it is not in agreement with another report in which RI decreased during short periods of gestation but increased or remained unchanged in others (2). Umbilical artery and fetal abdominal aorta increased their blood flow throughout gestation as previously reported in pregnant cats (1,2). To our knowledge, this is the first report of RI of fetal renal and internal carotid arteries in the course of feline pregnancy. Both parameters decreased during gestation as previously reported in dogs and humans (4,5). It is concluded that RI of uterine and umbilical, abdominal aorta, fetal renal and fetal internal carotid arteries progressively decreased during normal feline pregnancy.