DOPPLER ULTRASONOGRAPHY OF UTERINE ARTERY IN PREGNANT CANINES - A PRELIMINARY STUDY

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ABSTRACT

Doppler indices of uterine artery were recorded in the pregnant bitch (n=6) at different stages of gestation using doppler ultrasonography. The decrease in resistive index as gestational age advanced reflected increased perfusion towards uterus providing support for the fact that an increase in uterine blood supply is related to increased nutritional demands of growing fetus.

Keywords: Bitch, Doppler ultrasonography, Pregnancy, Resistive index, Uterine blood flow

Delivery of healthy offspring is the ultimate goal of a breeding program through proper management of pregnancy and whelping (Smith, 2007). Doppler ultrasound examination of the uterine artery is common in human pregnancy, since there is an association between blood flow parameters and adverse fetal outcome (Lacovella *et al*., 2012). However, very limited studies are available on doppler predictors of normal and abnormal gestation. Hence, the present study carried out investigations on doppler indices on uterine blood vessels in pregnant bitch.

Healthy pregnant bitch (n=6, age 2-6 yr, b wt 34±3 kg) at different stages of gestation were positioned in dorsal recumbency and the hair of ventral skin were shaved. Acoustic gel was applied to the transducer and coupled directly to the skin. Two-dimensional ultrasonography was used to identify the uterine body in a transversal axis. Color flow mapping was subsequently used to localize uterine arteries at both sides of the cervix and each ultrasonographic evaluation was successfully performed in within 30 min. The pulsed-wave doppler was used to obtain the uterine vessel waveforms (at least cardiac cycle, Figure 1) for the estimation of uterine blood flow (UBF) and resistive index (RI). As the difference was absent between doppler values for right and left uterine artery, hence data of artery of one side was used for interpretation of results.

The uterine artery blood flow (UBF) was almost similar between different stages of gestation (Pug: gestation 38 d, UBF 0.73 m/s; Sptiz: gestation 43 d, UBF 1.4 m/s; Pomeranian: gestation 48 d, UBF 0.81 m/s; Great Dane: gestation 55 d, UBF 0.82 m/s; Boxer: gestation 65 d, UBF 0.82 m/s), whereas uterine artery RI decreased consistently with an increase in gestational age (gestation 38 d, RI 0.63; gestation 43 d, RI 0.47; gestation 48 d, RI 0.45; gestation 55 d, RI 0.42; gestation 65 d, RI 0.32). The alterations in RI are suggestive of increased perfusion in uterine tissue

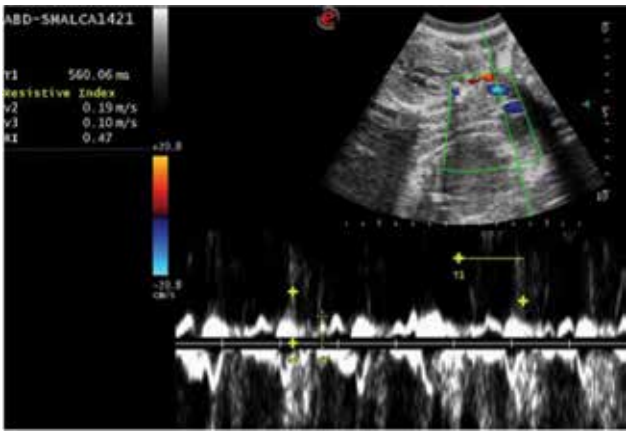

Figure 1: A representative spectral waveform of uterine artery in a pregnant bitch

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distal to uterine artery and these changes in the RI may be related to increased nutritional demands of growing fetus (Ferrell and Ford, 1980). In fact, the absence of the decrease in uterine artery RI was associated to adverse pregnancy outcome in humans and dogs (Cnossen *et al*., 2008 and Blanco *et al*., 2011). In summary, doppler ultrasonography can be used to assess the fetal development in canines. In future, breed-wise serial studies are required to generate the prognostic values for doppler-assisted assessment of fetal growth and wellbeing in canines.

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