ALTERATIONS IN UTERINE BLOOD FLOW OF COWS DURING THE FIRST TWO WEEKS AFTER PARTURITION MEASURED BY TRANSRECTAL DOPPLER SONOGRAPHY

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Objective: An undisturbed uterine involution after calving is very important for the fertility of the cow, but the evaluation of the uterine involution appears to be quite difficult especially in the first days post partum. During this period the size of the uterus cannot be determined by non-invasive methods like transrectal palpation and B-Mode sonography. The objective of this study was to test the suitability of the examination of alterations in uterine blood perfusion by transrectal color Doppler sonography to characterize the uterine involution during the early postpartum period.

Methodology: Investigations were performed during the first two weeks after undisturbed parturition in six primiparous Simmental cows. Transrectal color Doppler sonography was performed using a SSH 140 A ultrasound machine (Toshiba, Tokyo, Japan). The blood flow in both uterine arteries was evaluated on the day of calving (day 0), then daily for 8 days and finally every other day until Day 14. The blood flow was quantified by determining the diameter of the arteries, the time averaged maximum velocity (TAMV), the blood flow volume (BFV) and the pulsatility index (PI).

Results: The blood flow parameters showed characteristic changes in all six cows during the early postpartum period. The most profound alterations in all blood flow parameters of the uterine artery ipsilateral to the formerly pregnant horn were evident in the first four days after calving. The diameter, TAMV and the BFV exhibited a strong decrease (37%, 69% and 87%; P< 0.05), while the PI increased (158%; P< 0.05). During the remaining time (5 to 14 days post partum) all parameters demonstrated only moderate changes (diameter -17%, P< 0.05; TAMV -35%, P>0.05; BLV -49%, P< 0.05; PI +26%; P>0.05). The factor day post partum showed a strong influence on TAMV, BFV and PI (P< 0.05). The diameter was mostly affected by the side of uterine artery (P< 0.05).

Conclusion: The results of this study show that there are characteristic changes in uterine perfusion during the early post partum period, which can be examined by transrectal color Doppler sonography. Using this noninvasive technique, it is possible to obtain objective results for the evaluation of uterine involution even in the first few days after parturition.