POSSIBILITY OF MODULATION OF THE BOVINE UTERINE PERFUSION WITH THE USE OF SILDENAFIL CITRATE IN DAIRY COWS DURING LUTEAL PHASE OF THE OVARIAN CYCLE

M. Dzięcioł, W. Bielas, R. Kozdrowski, G. J. Dejneka, W. Niżański
michal.dzieciol@upwr.edu.pl

Wrocław University of Environmental and Life Sciences,
Department of Reproduction and Clinic of Farm Animals, Wrocław, Poland

A proper perfusion of the organs guarantee its proper functioning. Modulation of perfusion can be used to compensate for deficits as well as to create overperfusion which could have a curing effect for the tissue. The aim of the study was to evaluate the influence of the Sildenafil citrate after different rout of administration on the blood flow in the uterus of cows during dioestrus.

Uterine blood flow was examined in healthy, adult cows at the 6–8 day of the ovarian cycle. Experiment was divided on two parts depending on rout of sildenafil administration. In 1st experiment six cows received 200 mg of sildenafil diluted in 10 ml of warm saline into the body of the uterus and in second experiment another five cows received Sildenafil intravaginaly in the form of vaginal suppositories containing 200 mg per animal. In both cases a placebo infusion and suppository was also given to the cows. Analysis the maximum velocity in m/s (V max) in the aorta was performed and selected parameters of the blood flow (pulsatile index, PI; resistance index, RI; systolic peak velocity SPV; end diastolic velocity, EDV; flow velocity integral, FVI; systolic peak velocity: end-diastolic velocity ratio, SV/DV) were measured in the uterine artery (*arteria uterina*) before and after sildenafil infusion. In addition, Color Doppler examination of the uterine wall perfusion was evaluated and obtained results were analyzed with the *Pixel Flux* software (*Chameleon*, Germany). Animals were examined before and five times after drug application (two times at 15 min intervals, and three times at 2 h intervals). Statistical analysis was based on program *Statistica version 7.1* (2.3.1–2.3.2) (*StatSoft*, USA). The comparison of values of the evaluated parameters before and after sildenafil treatment was performed by Wilcoxon test, and $P<0.05$ was defined as representing a significant difference.

A significant decrease of values of PI and SV/DV ratio as well as an increase of end diastolic velocity and time averaged maximum velocity was noted. With the use of color coded sonography, the increased intensity of the blood flow in the uterine wall was observed in both method of sildenafil administration. After administration of sildenafil, significant differences in values of all parameters except SPV occurred ($P>0.05$).

It was concluded that intrauterine as well as intravaginal administration of sildenafil during dioestrus can increase uterine tissue perfusion. Further studies are indicated if this phenomenon could be useful for the uterine disorders treatment as a main or additional method of treatment.

Keywords: COWS, SILDENAFIL CITRATE, UTERINE PERFUSION