

## **PW15 Reducing fetal stress: Pharmacokinetics and placental transfer of anaesthetic drugs in sheep**

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Anaesthetic drugs cross the placenta to provide anaesthesia for the fetus in sheep.

The administration of anaesthetic drugs prior to surgical procedures is essential. Whilst anaesthesia of animals and humans of all stages post-parturition is well documented, little is known about the impact of anaesthetic drugs on the fetus [1,2]. Mass spectrometry was used to determine the extent of placental transfer of an anaesthetic drug combination from a pregnant ewe to its fetus(es).

An LC-MS (ion trap) method was developed for simultaneous identification and quantification of ketamine and medetomidine in sheep plasma [3]. Drugs were administered to non-pregnant (n=6), single pregnancy (n=3) and twin pregnancy (n=3) sheep and blood samples were taken at timed intervals. Fetal plasma samples were obtained immediately after caesarean delivery.

The data showed no significant differences between pregnant versus non-pregnant sheep and singleton versus twin pregnancies for both drugs over the course of the experiment. Placental transfer of both drugs was demonstrated by comparison of the drug concentrations of the final timed samples from the pregnant ewes with that of their respective fetuses.

[1] S.B.R. Kastner, S.M. Pakarinen, M.P. Ramel, A.P.N. Kutter, J Boller, M.K. Huhtinen. Comparative pharmacokinetics of medetomidine enantiomers in goats and sheep during sevoflurane anaesthesia. *Journal of Veterinary Pharmacology and Therapeutics*. 2006;29(1):63-66.

[2] B. Ranheim, J.M. Arnemo, S. Stuen, T.E. Horseberg. Medetomidine and atipamezole in sheep: disposition and clinical effects. *Journal of Veterinary Pharmacology and Therapeutics*. 2000;23:401-404

[3] J.D. Netto, G.C. Musk, G.L. Maker, R.D. Trengove. A validated method for the detection and quantification of ketamine and medetomidine in sheep plasma using LC-MS. Unpublished manuscript.