

A REVIEW OF OXYTOCIN USE FOR SOWS AND GILTS

**S. K. Linneen, J. M. Benz, S.S. Dritz, J.M. DeRouchey,
R.D. Goodband, and M.D. Tokach**

Summary

Oxytocin is frequently used to decrease farrowing time and birth interval as an aid to prevent stillbirths. However, recent research has shown that oxytocin use can increase the number of pigs stillborn when used too early in the birth process. This research indicates that the reason for increased stillbirths was increased ruptured umbilical cords leading to compromise of the pigs oxygen supply during the birth process. Oxytocin usage should be limited to older parity sows and the last half of the birth order.

Introduction

Swine producers use oxytocin to shorten farrowing length and interval between each pig born. A 1995 National Animal Health Monitoring System (NAHMS) study indicates 8.2% of swine producers administer oxytocin to all sows farrowed. Oxytocin is a hormone produced in the hypothalamus and excreted by the pituitary gland. It has numerous functions, but the two most known are for the milk letdown reflex and stimulation of uterine contractions. Oxytocin stimulation of uterine contractions will decrease the interval between piglet births and is used on many farms as an intervention to reduce still births and aid in the farrowing process. However, administering oxytocin before the cervix is fully dilated or the first pig is born can lead to dystocia or difficult birth. Improper oxytocin use can also cause an increased number of stillbirths by causing ruptured umbilical cords that lead to decreased oxygen delivery to the piglet during birth.

Discussion

A stillbirth is defined as a piglet that is normally developed but dies shortly after or during parturition and does not breath. Stillbirth numbers are typically higher in older parity sows and generally occur later in the birth order. For example in one study, 75% of stillbirths were recorded after the 8th pig was born when sows were allowed to farrow without intervention. In contrast, this same study indicated that 88% of stillbirths were recorded before the 5th pig was born when sows were administered a single dose of oxytocin after the first pig was born.

An evaluation of the risk factors for stillbirths on two commercial swine farms in Brazil indicated that use of oxytocin increased the risk for stillbirth. A total of 101 litters were evaluated from the first farm and 373 litters were evaluated in the second trial. This data indicated that the percent of litters with one or more still births was increased in each of the farms when oxytocin was given to the sow some time during the birth process (Figure 1).

Data from a prospective study indicated that stillbirths per litter were significantly increased after the administration of a single dose of oxytocin (Table 1). The control sows were allowed to farrow without intervention. The oxytocin group is the mean of two different oxytocin sources

where the sows were administered a single dose of oxytocin after the first pig had been born. All births were attended and the pigs were classified as live or stillborn. Presence of meconium staining and umbilical cord hemorrhage also were evaluated. Meconium staining is an indicator of inspiratory effort either in the uterus or birth canal when the piglet has low levels of blood oxygen.

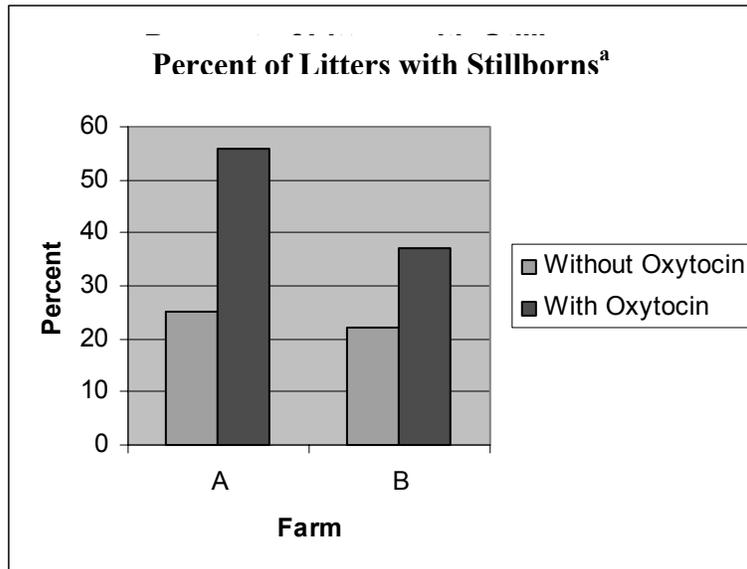
As expected the total farrowing time and interval between piglet births was reduced in sows administered oxytocin (Table 2). However, the number of intrapartum stillborn deaths and ruptured umbilical cords per litter were significantly higher among the oxytocin treated sows versus the control sows. Also, severe meconium staining was higher in live born and still born pigs born in oxytocin treated litters. Meconium staining is a good indicator that the piglets are oxygen deprived. Thus, this study suggests that oxytocin administration was causing umbilical cord injury that compromised delivery of oxygen to the piglet during the birth process which caused stillbirth deaths.

Although improper use of oxytocin has potentially negative implications, it also can be beneficial to the farrowing process to stimulate uterine contractions and prevent stillbirths in older sows. The recommended dosage is ½ cc (10 IU) to stimulate uterine contraction. Frequently, higher doses are used but higher doses will not improve the efficiency of oxytocin usage. The following are further recommendations for properly using oxytocin:

- Administer oxytocin only after the cervix is fully dilated
- Limit usage in gilt litters
- For a normally farrowing sow, do not use oxytocin until a minimum of 6 pigs have been born
- Use oxytocin when a sow has not had a piglet for over 40 minutes
- Only use a maximum of two doses per sow

Oxytocin should not be used as a substitute for obstetrical assistance. Indicators of need for obstetrical assistance are bloody discharge from the vulva, no piglets have been born in at least 40 minutes, obvious pain or straining, or a history of stillbirths.

Figure 1. Percentage of Litters from Two Farms with or without Oxytocin Administration.



^aLucia, T. et al. 2002. Prev. Vet. Med. 53:285-292.

Table 1- Farrowing Variable in Saline Solution-Treated (control) and Oxytocin-Treated Sows^a

Variables	Sow Group ^b	
	Control	Oxytocin
Farrowing time,min	316.68 ± 9.70	170.145 ± 4.71
Interval between piglet births, min	28.54 ± 0.63	14.37 ± 0.36
Intrapartum stillbirths per litter	0.73 ± 0.13	1.16 ± 0.1
Ruptured umbilical cords per litter	0.15 ± 0.05	0.64 ± 0.095
Inspiratory Effort, stillbirths per litter	0.35 ± 0.08	0.05 ± 0.015
Detectable Heart Rate, stillbirths per litter	0.50 ± 0.10	0.12 ± 0.04

^sD. Mota-Rojas et al. 2002 American Journal of Veterinarian Research 63: 1572

^bThe control sows were allowed to farrow without intervention. The oxytocin group is the mean of two different oxytocin sources where the sows were administered a single dose of oxytocin after the first pig had been born.

Table 3- Number of Intrapartum Stillborn Piglets per Litter with Various Variables Born to Control and Oxytocin-Treated Sows^a

Variables (stillborn piglets/litter)	Control	Oxytocin Treatment	
		A	B
Ruptured Umbilical Cords	0.15 ± 0.05	0.55 ± 0.09	0.73 ± 0.10
Inspiratory Effort	0.35 ± 0.08	0.10 ± 0.03	0.00 ± 0.00
Detectable Heart Rate	0.50 ± 0.10	0.16 ± 0.05	0.08 ± 0.03

^aD. Mota-Rojas et al. 2002 American Journal of Veterinarian Research 63: 2573