

## POSTPARTUM OXYTOCIN TREATMENT FOR PREVENTION OF RETAINED PLACENTAS

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Received for Publication: March 29, 1984

Accepted: July 19, 1984

### ABSTRACT

Some dairymen are attempting to reduce the incidence of retained placentas in their herds by routinely injecting oxytocin following parturition. Since there was little or no experimental evidence to support such a practice, a study was designed to test the influence of early postpartum oxytocin injection on the incidence of retained placentas. The study was designed so that every other cow in the University of Illinois dairy herd would receive an intramuscular injection of 100 IU oxytocin within three to six hours following calving. If the animal expelled the membranes before three hours she was placed in the control group. Two hundred cows calved during the one year study. In the 100 cow control group, twelve cows retained their fetal membranes whereas in the 100 cow treated group eight retained the placenta.

Key words: Retained placenta, oxytocin, postpartum

### INTRODUCTION

Oxytocin is an octopeptide secretion that is produced in the hypothalamus and stored in the posterior pituitary. After release, it is carried into the blood, where it has several important functions.

One well known function is to stimulate milk ejection by contracting the myoepithelial cells surrounding the alveoli. Ejection can be blocked by epinephrine or atropine, both of which are released in times of stress.

The effects of oxytocin on reproduction are not as well known, and certain aspects of this area are still being studied. When released during mating oxytocin may be a factor in hastening the time of ovulation (1-3). Smooth muscle contractions, which are stimulated

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by oxytocin, aid in the transport of sperm through the uterus and oviducts (4-8). It has been suggested that some problem breeders may be deficient in oxytocin.

Oxytocin also causes the prolonged, strong contractions at parturition which help expel the fetus. These contractions come every two minutes and last one minute or more. It has been estimated that these contractions do 90% of the work during calving.

Allen et al., (9) found that there was a low level of oxytocin in the mare during the early stages of labor, and in normal births the level rose sharply near delivery. In difficult births where traction was necessary, there was a lower level of oxytocin, and in Caesarian deliveries the oxytocin level rose during the expulsion of membranes. This suggests that maternal neurohypophysis secretion may be involved in the expulsion of the fetus after the cervix is opened. It may also suggest that a deficiency of oxytocin may cause these difficult births.

Once the fetus is delivered, contractions continue and eventually expel the fetal membranes. Normally, the attachments of the maternal cotyledons are loosened, and the placenta is discharged in one-half hour to eight hours. In cases of twinning, abortion, or dystocia the placenta often isn't expelled in the normal manner. It could be suggested that the added stress of abnormal delivery inhibits oxytocin, and the contractions are therefore insufficient to discharge the membrane.

A postpartum injection of oxytocin to prevent retained placentas has been practiced on the farm, but we were not aware of any studies designed to determine if oxytocin injections would alleviate the problem. Therefore, we designed this experiment to test the effect of postpartum oxytocin injections on the rate of retained placentas in the University of Illinois dairy herd.

## MATERIALS AND METHODS

Herd records of the three years prior to the study were checked to determine the extent of retained placenta problems in the University of Illinois dairy herd. From the results of this survey an experiment was designed to study the influence of oxytocin on the expulsion of fetal membranes. Five ml of 20 IU/ml oxytocin (Pitocin<sup>a</sup>) were administered intramuscularly to every other cow within three to six hours postpartum. Records were kept of the number of animals in either the treatment or control group that did not expel their fetal membranes within 12 hours.

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## RESULTS AND DISCUSSION

In the analysis of the herd over a three year period from 1977 to 1979 there was a recorded average of 19% retained placentas per year. This is higher than a normal herd average. Eleven percent of the retentions followed normal births, and 8% followed an abnormal delivery. There were seasons in each year which had a higher percentage of retained placentas, but the season with the highest percentage varied from year to year and showed no specific trend. The animals were fed stored feed year round, and had no access to pasture which should have eliminated nutrition as a cause of the seasonal variation.

Fifty percent of the cows with retained placentas had gestation lengths five days shorter and 30% had gestation lengths five days longer than expected. Since the sire of the fetus affects gestation length this variable was investigated. Cows producing calves from two of the sires did show a high rate of retained placentas. These sires, however, were also the herd clean-up bulls used on problem breeders, thus the cause for retained placentas was probably due to a cow effect. There was a high rate of reproductive failure in cows after they retained their fetal membranes. Over the three-year period, 136 animals had recorded retained placentas, and 42 of these (30%) were culled in the same period for reproductive problems.

In the experiment, there were 100 cows that were control, and 100 that received 5 ml of 20 IU/ml oxytocin IM within three to six hours postpartum. The experiment lasted from February 17, 1980 to November 26, 1980. In the control group twelve cows retained their placentas, and in the treated group eight cows retained, indicating no significant difference due to the small number of cows involved. The herd average for retained placentas in this particular year was about 10% which was about one-half the average of each of three previous years. So even though the number of control cows with retained placentas and the number of treated cows which appeared to expel the membranes were not significantly different, it appears that there is a beneficial trend, and the practice could help in some instances. Using a bioassay (10) we detected oxytocin present in the blood up to forty minutes after the intramuscular injection. Using the results of this study as a guide, we suggest that oxytocin injections not be considered as a cure since there are too many other variables involved in the retention of fetal membranes to be treated by a single method.

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