CHEMICAL EJACULATION USING IMIPRAMINE AND XYLAZINE

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With the exception of the Morgan stallion collected on April 23rd, all collections were made from a 5-year-old QH stallion, injured the day previous to the first chemical collection, while being led out to breed live cover. He had a severe surface cut of the lower left rump that required sutures. It was felt that live cover was contra-indicated. This stallion was an inexperienced stallion, having only bred 3 mares in a two-season period and each one only once. All ejaculations that were used to inseminate resulted in pregnancies.

All Xylazine was administered IV, and was presented in the standard commercial concentration of 100 mg/ml.

The semen collections were made by a handler squatting caudally to the horse’s midssection with a collection device made of a replaceable plastic bag held on a wire frame that had a 12 inch handle. This collection device was manipulated to catch the ejaculate without touching the penis.

March 25th, 1999

At 5.00 p.m., the stallion was given 600 mg of Imipramine orally in a mixture of molasses and water. Total volume +/- 45 ml. Lost approx. 4 ml on the ground.

At 6.15 p.m. he was given 1.5 ml of Xylazine HCL. His penis was extended and flaccid prior to administration. The horse appeared sedated to some extent. He had been kept in a quiet environment since being administered the Imipramine, and was facing, and remained facing the wall upon receiving the Xylazine.

At 6.30 p.m. despite an obvious state of tranquilization, there was still no ejaculation. A shovel full of estrus mare’s urine soaked bedding was introduced in front of the stallion. Within 5 minutes his penis became semi-erect, there was limited thrusting motion, and he ejaculated 20 ml of highly concentrated semen. Progressive motility was +/- 75%.

The semen was extended 1:2.5 with E-Z mixin CST, to a total volume of 70 ml.

The semen was divided into 3 aliquots, of which 2 were inseminated into mares and 1 stored overnight in the refrigerator in a water bath. This latter sample showed 20% motility cold and 60% warmed after 18 hours of cooled storage.

March 27, 1999

600 mg of Imipramine was given orally at 7.00 p.m.

2 ml Xylazine was given at 8.15 p.m. The horse was facing the aisleway upon tranquilization, with his head in the corner. Estrus mare’s urine soaked bedding was placed in the corner manger under his nose within 5 minutes of his receiving the Xylazine. The tranquilized state appeared very deep, and remained so for 20 – 25 minutes. Partial relaxation of penis. No suggestion of ejaculation.

Upon leaving the tranquilized state, attention was not focused on the urine soaked bedding. Eventually, there were 3 low volume ejaculations, spread out over a 15-minute period, and totaling not more that 7 ml. This was followed by stretching, and urination into the collection apparatus.

Over the next hour, repeated efforts to encourage ejaculation by use of an estrus mare’s urine soaked towel stimulus, and ultimately manual stimulation, proved fruitless. A small portion of pre-ejaculate was collected.

March 28, 1999

600 mg of Imipramine was given orally at 12.30 p.m.

The stallion was given 1.5 ml Xylazine at 1.45 p.m. He did not appear as subdued as he had on previous occasions prior to the administering of the Xylazine injection, and was facing the wall upon being given the Xylazine, and kept in that position by a head handler throughout the process. As he was entering a tranquilized state, he had an estrus mare’s urine soaked rag in a bucket introduced under his nose. This was placed on the floor, and he was allowed to lower his head to sniff it. Within 2 minutes of the introduction of the rag, and 4 minutes of the Xylazine injection, the horse ejaculated 80 ml. Concentration was not as high as on the first day. Motility was 80% +.

This ejaculate was mixed with 70 ml of E-Z Mixin’ CST extender and used to inseminate 3 mares with 30 ml each. The remaining 60 ml were refrigerated in a water bath and showed 50%+ motility warmed at 16 hours.
March 31st, 1999

600 mg of Imipramine was given orally at 8.45 p.m.

The stallion was given 1.5 ml Xylazine at 10.00 p.m. He was kept facing the wall, but there was more ambient sound. While entering a tranquilized state, there was a small amount (4 or 5 drops) of pre-ejaculate, but no semen. As he was showing signs of exiting the tranquilized state, as evidenced by his picking up his lead rope in his teeth, estrus mare’s urine in a bucket was introduced under his nose. Interest was transient, but ejaculation occurred fewer than 2 minutes later.

This ejaculate consisted of 50 ml of concentrated semen showing 80% + progressive motility, and with little seminal fluid. It was extended with 125 ml of EZ Mixin’ CST. 2 mares were inseminated on farm, and the balance was stored in the refrigerator in a water bath. The cooled sample was showing 50% + progressive motility when warmed 16 hours later.

April 2nd, 1999

600 mg of Imipramine was given in the feed at 6.15 p.m.

1.5 ml of Xylazine was administered at 7.30 p.m. The horse was kept facing the wall. As he was entering a tranquilized state, estrus mare’s urine was presented on a rag in a bucket. 2 minutes later he ejaculated 30 ml of concentrated semen. Concentration was $429 \times 10^6$, progressive motility 80%+

The semen was initially extended with 40 ml of modified Kenney extender (DWF-B4), and 10 ml of this was withdrawn and further extended with an additional 40 ml of modified Kenney, and packed in an Equitainer. This was used to inseminate one mare off-farm the next morning, and was evaluated at 24 hours (60% progressive motility, warm) and 48 hours (40% progressive motility, warm).

The rest of the semen was used to inseminate 2 mares on-farm immediately.

April 6th, 1999

The stallion had his sutures removed, and was tranquilized with Xylazine and Torbugesic. Approximately 15 minutes after receiving the tranquilizers, he ejaculated in the stall, with no apparent external stimulus.

April 7th, 1999

600 mg of Imipramine was given in the feed at 6.15 p.m.

1.5 ml of Xylazine was given at 7.30 p.m.

The horse did not appear as subdued at the time of receiving the Xylazine as he had previously, and exhibited a mouthy playfulness towards his handler. Estrus mares urine was presented as he was entering a tranquilized state, and again as he was exiting. On neither occasion did he show the same level of interest as he had on previous occasions. He achieved a state of semi-erection briefly during his deeper tranquilized period, and also remained “dropped” throughout. He did not however ejaculate. There was more pre-ejaculatory fluid discharged than had previously been seen.

April 8th, 1999

600 mg of Imipramine was given in the feed at 7.30 am.

1.5 ml of Xylazine was given at 10.00 am. (A longer delay between the administering of the Imipramine and the Xylazine had been planned, but a scheduling error resulted in 2.5 hours instead of 2 hours).

The horse again entered and exited deeper tranquilization with estrus mare’s urine being presented, and again showed little interest. There was a brief period of erection and discharge of pre-ejaculate but he did not ejaculate.

April 9th, 1999

600 mg of Imipramine was given in the feed at 8.00 p.m.

1.5 ml of Xylazine was given at 9.15 p.m.

The results were the same as for April 7th and 8th, with no ejaculation.

The initial dose of Xylazine was followed by another 1.5 ml about 25 minutes later. Again there was no ejaculation.
Manual stimulation using the Crump protocol followed once the horse had recovered from tranquilization, and although there was thrusting, a certain degree of flowering and lowering of the hindquarters, all that was collected was approximately 15 ml of pre-ejaculate.

April 10th, 1999

With the intention of collection in the AV (Lane), the stallion, which was very dominant in the stallion/handler relationship, was presented to a mare that we had been advised was “a good mare to breed”, and believed to be in estrus. The mare upon being approached kicked at the stallion, which showed an equivalent response.

It was felt that collecting using this mare as a “jump mare” was not safe.

The stallion was returned to his stall, and while being teased was allowed to breed the AV. He was enthusiastic, and bred well, thrusting and dropping the hindquarters, but not ejaculating. The process was repeated with the water in the AV having been heated up (internal temperature 45°C). The response the second time was the same, although the stallion flowered and flagged with his tail. There was about 25 ml of pre-ejaculate collected during these 2 attempts. (It was confirmed under the microscope that this was pre-ejaculate).

A third attempt was made using a Missouri AV, with an initial internal temperature between 45° and 48°C. Again, the stallion showed every indication of being about to ejaculate, but did not. At this point, the stallion was becoming increasingly irritated, and it was felt it would be better to refrain from further attempts.

April 12th, 1999

600 mg of Imipramine was given in the feed at 7.15 p.m.

1.5 ml of Xylazine was administered at 8.45 p.m. with estrus mare’s urine introduced on a rag as a stimulus immediately after.

The stallion was held facing the stall wall as he entered a tranquilized state, he was erect at this time, and had a single ejaculatory spasm, but no fluid was produced. Once he became more heavily tranquilized he lost his erection and remained only semi-dropped.

After about 15 minutes, he exited deep sedation rapidly with no ejaculation. He was administered another 1.5 ml of Xylazine, but this did not produce ejaculation of semen, although it did result in 3 ejaculatory spurts containing pre-ejaculate.

April 13th, 1999

150 mg of Imipramine was given in the feed at 9.00 a.m. This reduced dose was calculated by considering the horse would still have approximately three-quarters of the 600 mg given the previous night in his system, the half-life being 20 hours and this morning’s dose being given only a little over 12 hours after last nights.

3 ml of Xylazine was administered at 10.45 am with estrus mare’s urine introduced on a rag as a stimulus immediately after.

The stallion was held facing the aisleway by a lead rope held by someone outside the stall, and although quiet was maintained during this stage of the process, normal stable routine had been carried on up to this point.

The stallion ejaculated within 4 minutes of the administering of the Xylazine, with more penile activity than has previously been seen. Although not fully erect, there was far more of an ejaculatory spasm causing movement of the penis. There was 90 ml of ejaculate, with 80% motility.

April 21st, 1999

600 mg of Imipramine was given in the feed at 1.15 p.m.

3 ml of Xylazine was administered at 3.00 p.m. with estrus mare’s urine introduced in a bucket as a stimulus immediately after.

The stallion was facing the stall wall, and ejaculated within 5 minutes of the administering of the Xylazine. There was a similar amount of penile movement of the semi-erect penis as last time.

There was 85 ml of ejaculate, with 75% motility, at a concentration of 113 x 10^6 per ml.

April 23rd, 1999

1,000 pound Morgan stallion. 9 years of age. This stallion has been used predominantly in a live cover situation, but has also been collected using an AV.
The stallion was administered 600 mg of Imipramine po in a molasses drench at 12.25 pm.

2.5 ml of Xylazine was administered at 2.15 p.m., with estrus mare’s urine introduced in a bucket as a stimulus immediately after. The stallion had been kept quiet, but was not in a particularly sedated state at the time of the administering of the Xylazine.

The stallion dropped his penis prior to entering a tranquilized state. The penis became erect about 5 minutes after the administering of the Xylazine, and about 2 minutes after that the stallion ejaculated, with penile movement.

There was 40 ml of ejaculate, with 75% motility, at a concentration of 262 x 10^6 per ml.

April 24th, 1999

The Quarter Horse stallion was given 600 mg of Imipramine in feed at 3.45 p.m.

2 ml of Xylazine was given at 5.45 p.m.

The stallion dropped, and became erect towards the end of the tranquilized state. He did not however ejaculate.

April 26th, 1999

The Quarter Horse stallion was given 600 mg of Imipramine in feed at 11.00 a.m.

3 ml of Xylazine was given at 1.00 p.m.

The stallion behaved as on the 24th April, and did not ejaculate.

At 7.30 p.m. he was given another 3 ml of Xylazine, and ejaculated about 25 minutes later upon stimulation while exiting heavy tranquilization.

There was 30 ml with a concentration of 340 x 10^6 per ml. Motility was 85%. Some of this semen was extended 8:1 in Kenney extender, and was still 20% motile at 96 hours.

OBSERVATIONS:

- Pregnancies resulted from semen collected in this manner.
- It may be that the action of the Imipramine is greater if it is administered shortly after a meal or concurrently with food.
- Quiet and lack of abnormal stimulus during the period immediately following the administering of the Imipramine, through to after the administration of the Xylazine appear important.
- If the stallion is facing a wall, rather than an area of activity, the results initially appeared to be better. Latterly, we question if this does make a difference.
- A rag soaked in fresh estrus mare’s urine appears to be the best stimulus, and this should be held as close as possible to the nostrils, without touching.
- The stallion is most likely to ejaculate either while entering or exiting the tranquilized state brought on by the Xylazine.
- The suitable dosage of Xylazine should probably be “tailor made” for the horse, and possibly even for the occasion. Topping up after the horse emerges from a deeper tranquilized state without ejaculating does not appear to assist.
- It is questioned if the Torbugesic had some inhibitory effect on chemical ejaculation following the removal of the sutures. As the stallion did ejaculate at that time, this is questionable, but this appears to be the only variable added to the equation at that point.
- It is questioned if Imipramine, which is known in humans to also inhibit ejaculatory response, could have a cumulative effect, and a similar inhibitive effect when administered repeatedly in a short period. It is known that the “half-life” of Imipramine is approximately 20 hours; so repeated dosing over a period of successive days would result in high body levels.
- It is questioned if it is necessary to increase the Xylazine dosage over a period of repeated ejaculations, as there appears to be some refractory response causing failure of the ejaculatory response when being used often.
- Anecdotal evidence from others indicates that stallions that have undergone chemical ejaculation using this protocol will be more likely to ejaculate spontaneously when sedated with Xylazine for other procedures.