

TOCODYNAMOMETRIC STUDY IN CASES OF PRIMARY UTERINE INERTIA IN DOGS

Prashantkumar¹, A. Krishnaswamy, T.G. Honnappa, V.C. Murthy²,
M. Narayana Bhat and L.Rangnath

¹M.V.Sc. Student, Department of Veterinary Gynaecology and Obstetrics; ²Professor & Head, A.L.F.C.,
Veterinary College, Hebbal, Bengaluru.

[Received: 02.11.2018; Accepted: 06.5.2019]

{DOI 10.29005/IJCP.2019.11.1.038-041}

To quantitatively evaluate the uterine activity, a tocodynamometric method, developed based on recording of uterine contractions across the abdominal surface is used. The study was carried out on 40 clinical cases of dystocia in female dogs, diagnosed to be due to complete primary uterine inertia based on history and clinical signs, when presented to the obstetrical clinics in Veterinary College Hebbal, Bengaluru. The uterine contraction patterns were recorded using a tocodynamometer designed for human patients. The strength of the uterine contractions was less than 10 per cent for the entire duration of monitoring in all cases. The number of strong uterine contractions was never more than 3 during the period of monitoring. The uterine tocodynamometer was clearly useful in identifying that complete primary uterine inertia is associated with infrequent uterine contractions.

Keywords: Canine dystocia, Tocodynamometer, Uterine inertia.

Dystocia defined as difficult birth or inability to expel the foetus/ foetuses through the birth canal without assistance constitutes a serious problem in the bitch. Dystocia has conveniently been described as being maternal or foetal in origin and there is overwhelming evidence that in the bitch, maternal dystocia is encountered more frequently (Gaudet, 1985; Darvelid and Linde-Forsberg, 1994). There is also evidence that the most common cause of maternal dystocia is uterine inertia, representing 40 per cent (Gaudet, 1985) to 75.3 per cent (Darvelid and Linde-Forsberg, 1994) of all dystocia attributed to the dam.

The most common form of uterine inertia in bitches is primary uterine inertia, which has been further classified as complete or partial (Van Den Weijden and Taverne, 1994). In complete primary uterine inertia, the bitch does not start labour. In partial primary uterine inertia, the bitch starts to deliver her puppies, but the labour ends prematurely, despite the presence of a patent birth canal (Bergstrom *et al.*, 2006).

Labour is the physiological process by which a foetus is expelled from the uterus through the vagina and is characterized as regular uterine contractions accompanied by

cervical effacement and dilatation (Maul *et al.*, 2003) and it is commonly believed that uterine inertia is associated with complete absence, weak or asynchronous uterine contractions. The greatest impediment to understanding normal labour, besides recognizing its onset (Pates *et al.*, 2007), is related to the evaluation of the quality of the uterine contractions, in term of strength, duration, and frequency, since they are not appreciable externally. To quantitatively evaluate the uterine activity, a tocodynamometric method has been developed based on recording of uterine contractions across the abdominal surface (Maul *et al.*, 2003). Tocodynamometry is a new approach in canine obstetrics to diagnose delivery problems.

Therefore, the present study was designed to determine the uterine contraction pattern in cases of primary uterine inertia using Tocodynamometer.

Materials and Methods

The Study was carried out on 40 clinical cases of dystocia in female dogs, when presented to the obstetrical clinics in Department of Veterinary Gynaecology and Obstetrics, Veterinary College Hebbal, Bengaluru. A diagnosis on the basis of history and clinical signs, that dystocia due to Complete Primary Uterine Inertia was made,

Part of M.V.Sc. Thesis

if the animal presented had a history and ultrasonic evidence of completion of pregnancy term, complete absence or the presence of very weak signs of first stage of labour, and the presence of greenish or blackish-green lochia on the perineum, vulva or vestibule for atleast two hours. In some cases when the history was suggestive of complete primary uterine inertia, but there was no evidence of lochia in the perineum, the anterior vagina was further examined using a rigid vaginoscope to identify the presence of discharges or cervical opening. Tocodynamometer designed for veterinary use is not available in India, hence a uterine tocodynamometer designed for human obstetrics was used to evaluate the pattern of

uterine contractions in female dogs diagnosed with complete primary uterine inertia.

Recording of uterine tocodynamometry

The uterine contraction patterns were recorded in the cases diagnosed as complete primary uterine inertia using a tocodynamometer (SONICAID TEAM). The tocodynamometer used consisted of a uterine sensor, a recorder, and a modem. (Fig 1). The lateral abdomen of the animal was clipped, and the animal was placed on an animal examination table in the lateral recumbency (Fig 2). The uterine sensor was placed and kept pressed on the abdominal skin and was secured with abdominal belts. During uterine monitoring, the bitches were kept



Fig 1: Uterine tocodynamometer



Fig 2: Uterine tocodynamometric studies being carried out in an animal placed on lateral recumbency

quite avoiding any movements. Uterine contractions were recorded for 30 minutes. The uterine tocodynamometer displays the uterine activity both in terms of percentage as well as in the form of graph displaying the frequency of uterine contractions. In the present study, contractions less than 10 per cent were considered to be baseline uterine pressure and contractions in excess of 80 per cent were considered as nearly optimal.

The number of uterine contractions over a period of 30 minutes was recorded in each bitch with complete primary uterine inertia and this was done before initiation of any treatment for the relief of dystocia. The animal was considered to be in active labour if the tocodynamometer identified 8-10

contractions over a period of 30 minutes with each contractions lasting for 3-5 minutes.

Results and Discussion

The tocodynamometer do not require invasive probes, allowing them to be used for most pregnancies without risk to the mother or the foetus. At present a tocodynamometer using specialized uterine pressure sensors for canines has been developed to objectively record uterine activity as also reported by Davidson (2001). Tocodynamometry has become a new approach in canine obstetrics to diagnose delivery problems. However, its use in canine obstetrics even in some of the developed countries appear to be limited.

The canine uterus each have characteristic patterns of contractility, varying in frequency and strength before and during

different stages of labour as also reported by Wallace (1994) and Davidson (2003). Serial tocodynamometry in the bitch and queen permits evaluation of the progression of labour. Further abnormal, dysfunctional labour patterns can be weak or prolonged, and often are associated with foetal distress and the completion of labour can be evaluated via tocodynamometry as also mentioned by Davidson *et al.* (2003).

The uterine contractions in cases of complete primary uterine inertia were monitored over a period of 15 minutes, similarly using a veterinary uterine tocodynamometer by Groppetti *et al.* (2010) considered that the bitch was in active labour when the uterine contractions were 10 mmHg in strength and frequency ranged from 4-12 contractions per hour, each one of 2-5 minutes duration. After the onset of labour, the intrapartum detection of 0-3 mild

contractions per 30 minutes without parturition, constituted recommendation for medical management of uterine inertia.

In the present study, the strength of the uterine contractions was less than 10 per cent (optimum - 80 % and above) for the entire duration 30 minutes of monitoring in all cases of complete primary uterine inertia (Table 1). Further, the number of strong uterine contractions were never more than 3 during the entire period of monitoring (Table 1). The uterine tocodynamometer was clearly useful in identifying that complete primary uterine inertia is associated with infrequent uterine contractions. This observation suggested that the animals need to be medically managed using ecbolics and therefore the animals were subsequently infused with either oxytocin, calcium or dextrose, either alone or in combination.

Table 1: Strength and frequency of uterine contractions in cases of complete primary uterine inertia (n=40)

Strength and frequency of uterine contractions	No. of cases	Percentage
Poor (less than 50%), Mild and infrequent	40	100
Moderate (50-80%), Mild and moderately frequent	00	00
Optimum (more than 80%), Strong and frequent	00	00
Total	40	100

Conclusions

Uterine contractions in dog presented with the history of dystocia can be monitored by using a tocodynamometer which helps in early diagnosis of primary uterine inertia. Also, one can use the tocodynamometric study to decide upon the treatment protocol or surgical interventions at the earliest based on the strength and frequency of uterine contractions. This helps to improve puppy survival rates.

References

Bergstrom, A., Fransson, B., Lagerstedt, A.S. and Olsson, K. (2006). Primary uterine inertia in 27 bitches: aetiology and treatment. *J. Small. Animal. Prac.*, **47**: 456-460.

Darvelid, A.W. and Linde-Forsberg, C. *Indian Journal of Canine Practice* ISSN: 2277-6729 e-ISSN: 2349-4174

(1994). Dystocia in the bitch: A retrospective study of 182 cases. *J. Sm. Anim. Pract.*, **35**: 402-407.

Davidson, A.P. (2001). Uterine and fetal monitoring in the bitch. *Veterinary Clinics of North America: Small. Anim. Pract.*, **31**(2): 305-313.

Davidson, A.P. (2003). Obstetrical monitoring in dogs. *Vet. Med.*, **6**: 508-516.

Davidson, A.P., Grundy, S.A. and Foley, J.E. (2003). Successful medical management of neonatal canine herpesvirus: a case report. *Comm. Therio.*, **3**(1): 115-120.

Gaudet, D.A.J. (1985). Retrospective study of 128 cases of canine dystocia. *Am. Anim. Hosp. Assoc.*, **21**: 813-818.

Groppetti, D., Pecile, A., Del, A.P., Copley, K., Minero, M. and Cremonesi, F. (2010).

- Evaluation of newborn canine viability by means of umbilical vein lactate measurement, apgar score and uterine Tocodynamometry. *Theriogenology*, **74**: 1187-1196.
- Maul, H., Maner, W.L., Saade, G.R. and Garfield, R.E. (2003). The physiology of uterine contractions. *Clin. Perinatol.*, **30**: 665-676.
- Pates, J.A., Mcintire, D.D. and Leveno, K.J. (2007). Uterine contractions preceding labour. *Obstet. Gynaecol.*, **110**: 566-569.
- Van Den Weijden, B.C. and Taverne, M.A.M. (1994). Aspects of obstetric care in the dog. *Vet. Q.*, **16**: 20-22.
- Wallace, M.S. (1994). Management of parturition and problems of the periparturient period of dogs and cats. *Sem. Vet. Med. Surg. Sm. Anim.*, **9**(1): 28-37.