

# CLINICAL EFFICIENCY OF OXYTOCIN AND METOCLORPRAMIDE IN STIMULATION OF LACTATION IN BITCHES

S. Raheema<sup>1</sup>, C. Jayakumar<sup>2</sup>, J. Smitty and K. Devalal

<sup>1</sup>M.V.Sc. Student, <sup>2</sup>Assistant Professor; Department of Animal Reproduction, Gynaecology and Obstetrics, College of Veterinary and Animal Sciences, Kerala Veterinary and Animal Sciences University, Mannuthy, Thrissur.

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Though planned caesarean section is a management option feasible in canine high risk pregnancies, it may adversely affect lactation compared to normal vaginal deliveries. The production of milk is controlled by interplay of hormones, with prolactin being the predominant hormone. Methods aimed at stimulating release of prolactin from anterior pituitary along with the ability of oxytocin in stimulating milk let down might improve the lactation in dogs subjected to elective caesarean section. The clinical efficiency of a combination of metoclopramide and oxytocin in stimulation of lactation in bitches subjected to elective caesarean section was studied. Satisfactory lactation in the mother and a better neonatal wellbeing without any undesirable side effects was the outcome of the therapy.

**Keywords:** Elective caesarean section, Galactagogues, Lactation.

**H**igh-risk pregnancies are those in which high incidence of maternal, fetal and/or perinatal morbidity or mortality is expected to be higher. The criteria for categorization as high risk pregnancy were as described by Johnson (2008). The goals of managing high-risk pregnancies are to optimize maternal, fetal and perinatal health, maintain lactation and maximize the survival of the pups. Fewer complications are associated with planned caesarean section over unplanned and emergency caesareans in dogs (Jayakumar *et al.*, 2013). However, planned caesarean sections may adversely affect lactation compared to vaginal deliveries. Milk production is essential for optimal feeding of newborn and has a direct impact on growth, development and health in the neonatal period. Two mechanisms involved in establishment of successful lactation include the release of prolactin and the release of oxytocin. The release of prolactin from the anterior pituitary stimulates the production and secretion of milk, while the release of oxytocin from the posterior pituitary aids in the contraction of myoepithelial cells within the mammary gland, resulting in milk letdown (Gabay, 2002). Most of the existing galactagogues act by increasing the production and release of prolactin from the anterior pituitary gland (Zuppa *et al.*, 2010). Metoclopramide antagonize the effect of

dopamine in the central nervous system which increased prolactin levels and so, was used in small animals to treat cases of secondary hypogalactia or agalactia (Kahn, 2010). The present study, hence, aimed to assess the clinical efficacy of metoclopramide and oxytocin instimulation of lactation in dogs subjected to elective cesarean section.

## Materials and Methods

The study was carried out in six dogs of different breeds with high risk pregnancy presented to the University Veterinary Hospital, KVASU, Kokkalai, Thrissur. Two Beagle dogs and one British Bull dog with previous history of caesarean section; two Labrador retriever dogs with a high litter size of more than eight puppies as determined by radiographic examination and one Rottweiler dog that suffered complete loss of puppies at birth from complete primary uterine inertia. The elective caesarean was scheduled after recording the first signs of parturition on vaginoscopic examination or until the progesterone level falls below 2ng/mL, to avoid immaturity of the fetus. In two cases, where the dogs were brought from distant places and where professional service was lacking nearby, caesarean was scheduled when the peripheral progesterone declined to 5ng/mL. In these dogs, Dexamethasone @1mg/kg to promote lung surfactant production in the puppy was provided and an

elective caesarean was planned the following day. Before the elective caesarean, the viability of fetuses was assessed by trans-abdominal sonography. On clinical examination, the mammary glands though appeared normal; no milk was evident on mild stripping of the teats.

### Treatment and Discussion

Elective caesarean was performed in all the six dogs under propofol induction and maintenance with isoflurane anesthesia. These dogs subjected to elective caesarean were administered oxytocin @ 1 IU, S/C, every two hours with concurrent administration of metoclopramide @ 0.1mg/kg, S/C, every 8 hours until lactation was adequate and was further continued with oral administration of metoclopramide alone

@ 0.2 mg/kg, tid, orally for a day. The neonates were removed from the dam before each injection and returned 10 minutes later to suckle. When suckling was not vigorous, mammary glands were gently hand stripped. Lactation was adequate in all the treated dogs within 12 to 24 hours with a mean of  $16.66 \pm 4.50$  (mean  $\pm$  SD) hours of initiation of treatment as evinced by engorged mammary glands, vigorous suckling by puppies and excellent neonatal survival rate (Table-1 and Fig.1). The live birth rate was 91.11 per cent (41/45) and no undesirable effects were noticed in the puppies and dams. The neonatal mortality upto 48 h was 4.88 per cent (2/41), upto first week of birth was 7.31 per cent (3/41) and no puppy mortality was noticed in the second week. The overall neonatal mortality was 12.19 per cent (5/41).

**Table-1: Neonatal mortality in dogs following elective Caesarean section and stimulation of lactation**

No: of dogs	Live birth	Still birth	Neonatal mortality				Mean interval from treatment to adequate lactation (h)
			Within 48h	Within 7d	Within 14d	Overall neonatal mortality	
6	91.11% (41/45)	8.89% (4/5)	4.88% (2/41)	7.31% (3/41)	0	12.19% (5/41)	16.66 $\pm$ 4.50 (12 to 24h)



**Fig.1- Beagle that underwent elective Caesarean section (Before and after treatment)**

Galactogogues are synthetic or plants molecules used to induce, maintain, and improve milk production working either directly or indirectly on the hormonal pathways that control lactation as also reported by Mortel and Mehta (2013). The activation of dopamine receptors on prolactin-secreting cells inhibits the release of prolactin. So the medications used to induce lactation generally exert their effects through antagonism of the dopamine receptor, which results in a subsequent increase in prolactin release. Metoclopramide, antagonize the release of dopamine in the central nervous system and increased prolactin levels. Oxytocin induces smooth muscle contraction in mammary myoepithelial cells that surround the alveoli and milk ducts and is the principal hormonal factor for milk letdown as also mentioned by Gimpl and Fahrenholz (2001). The higher live birth rate (91.11 %) in the study signifies the safety of elective cesarean in dogs with high risk pregnancy. The overall neonatal mortality rate recorded in the animals subjected to elective cesarean and lactation promoted with a combination of metoclopramide and oxytocin was lower (12.19 %). The high neonatal survival rates (87.81%) observed in the study could be attributed to the elective cesarean performed in high risk pregnancy and the optimal milk feeding of newborn. This highlights the clinical efficacy and safety of combined oxytocin and metoclopramide treatment in

stimulating lactation in high risk pregnancy dogs subjected to elective caesarean section.

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