# INFLUENCE OF TYPE OF WHELPING ON NEONATAL MORTALITY IN PUPS

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**ABSTRACT**

The puppies (n=100) born to bitches that underwent Spontaneous Whelping (SW), Assisted Whelping (AW) and Caesarean section (CS) were divided into groups as SW (n=30), AW (n=35) and CS (n=35). Out of 100 puppies, 25% were born dead (2% SW, 7% AW and 16% CS). Among viable pups at birth, the early neonatal mortality till 24 h was 18% (0% SW, 5.7% AW and 45.7% CS). In brief, the stillbirth and early neonatal mortality was high in pups delivered through caesarean compared to spontaneous or assisted whelping.

**Key words**: Assisted whelping, Caesarean section, Neonatal mortality, Pups, Spontaneous whelping

The newborn puppy is an immature animal, dependent on its dam for survival in the first three weeks and as a consequence the etiology of neonatal death is frequently complex and often undetermined (Blunden, 1998). The majority of pup losses are stillbirths and deaths within the first week of life known as perinatal mortality. The mortality can occur *in utero*, during expulsion, after birth, in first weeks of life or after weaning. The causes for high pup mortality in perinatal period can relate to several factors concerning bitch (mismothering, lack of milk, trauma), birth process (prolonged labor, dystocia, obstetrics), puppy (low birth weight, congenital malformations, starvation), environment and presence of infectious agents (Munnich, 2008).

The puppies born to bitches (age, 2-6 yr) of different breeds with the history of progressive whelping and / or dystocia were used in the present analysis. A total of 100 puppies born to bitches that underwent Spontaneous Whelping (SW), Assisted Whelping (AW) and Caesarean section (CS) were selected. The puppies born to five bitches without any medical, manual or surgical assistance either to dam or puppies were kept in group I (SW, n=30).

The puppies born to ten bitches that delivered through either manual or medical assistance were kept in group II (AW). Manual assistance was attempted to puppies which were partly expelled from the vagina and/or the puppies whose parts were within reach on vaginal examination but not progressed further. The bitches were allowed in standing position or restrained on their lateral recumbency and the vaginal passage was well lubricated with liquid paraffin. The body of puppies were grasped gently and pulled steadily away from the bitch caudo-ventrally. While applying traction, care was taken to ensure that force was not applied on the limbs of puppies. Induction protocol was initiated with slow intravenous injection of oxytocin @ 1.1-2.2 IU/kg IM or SC with a dose range between 5-20 IU every 30 min and concurrent administration of 10% calcium gluconate @ 0.5-1.5 ml/kg to augment the effect of oxytocin on myometrial contraction and intravenous fluids to correct hydration, electrolyte, and blood glucose abnormalities. In between, whenever the bitches were straining, manual assistance was given to deliver the puppies.

The puppies born to nine bitches that underwent caesarean section were in group III (CS). Under general anaesthesia using propofol @ 3 mg/kg and diazepam @ 0.5mg/kg for induction and 2% isoflurane for maintenance, caesarean section was performed

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through mid-ventral approach by adopting standard surgical procedures.

Out of 100 pups evaluated, 25% were born dead (6.7% SW, 20% AW, 16% CS), 8% died within 30 min (0% SW, 5.7% AW, 17.1% CS), 6% died within 2h (0% SW and AW, 17.1% CS), 4% died in 2-24h (0% SW and AW, 11.4% CS), and 57% survived beyond 24h (93.3% SW, 74.3% AW, 8.6% CS).

The incidence of born dead or stillbirth in the present study (25%) is higher than earlier studies reporting between 4.3-11.5% (Indrebo *et al*., 2007; Tonnessen *et al*., 2012), that could be due to higher stillbirths in CS group which were delayed cases. Further, the effect of fetal distress arising from dystocia or the fetus retained for long time in the uterus or birth canal or exposed to effects of oxytocin prior to resorting emergency CS may be responsible for increased incidence of stillbirths in present study (Gropetti *et al*., 2010; Jayakumar *et al*., 2015). Hence, most of the still born puppies may be saved if timely adequate veterinary assistance is given.

Among viable pups at birth, the early neonatal mortality till 24 h was 18% (0% SW, 5.7% AW and 45.7% CS) in the present study, which was higher when compared to an earlier report (Potkay and Bacher, 1977). The high incidence of neonatal mortality was mainly in pups delivered through CS which might be due to hypoxia, hypoglycemia and hypothermia due to delayed whelping (Münnich and Küchenmeister, 2014) followed by the effects of anaesthetic agents on the cardiac, respiratory and nervous systems during CS. Hence, the number of early neonatal mortalities may be reduced if CS is performed at the earliest.

In brief, an early and adequate veterinary assistance can reduce the incidence of stillbirth and neonatal mortality in pups.

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