

Studies on Incidence and Factors Influencing Fetal Dystocia in Canines

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Abstract

The study was conducted to evaluate the effect of breed, age, size and parity on bitches with fetal dystocia and overall incidence of fetal dystocia. The Overall incidence of dystocia was determined as 4.03 percent in which maternal dystocia was recorded at a higher incidence than fetal dystocia. Nearly 40 percent of fetal dystocia were recorded in Pug and Labrador retriever. Further, highest incidence of fetal dystocia was recorded in primiparous bitches and bitches under four years of age were more frequently affected. Fetal dystocia was most commonly observed in small and medium sized breeds.

Keywords: Age; canine; fetal dystocia; incidence; parity

Introduction

Dystocia is defined as difficult birth or inability to expel fetus through birth canal without assistance. Dystocia is a common emergency in canine patients. The condition can be life-threatening to both mother and fetus, when it occurs, it is of great emotional stress to owner (Daval, 2000). The Veterinarians encounter dystocia cases more frequently than in the past as course of parturition has been documented to be influenced by such factors as breed (Smith 1974 and Gaudet, 1985), age (Darvelid and Linde-Forsberg, 1994), size (Christiansen, 1984) and parity (Gaudet, 1985 and Darvelid and Linde-Forsberg, 1994) of the bitch. Further, tendency of breeders to obtain extraordinary litter through various breeding practices is likely to significantly increase incidence of dystocia in their kennel. Therefore an effort is made to record incidence and factors influencing fetal dystocia in female dogs.

Materials and Methods

The data during present investigation was generated by analyzing the medical records of dystocia maintained and clinical cases of dystocia handled during the course of present study.

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Clinical records of dystocia cases presented between January' 2007 and March' 2012 as well as clinical cases of dystocia handled during the course of present study (April' 2011 and March' 2012) were pooled together to analyze the overall incidence of fetal or maternal dystocia and various factors influencing incidence of fetal dystocia.

Results and Discussion

In the present study, a retrospective analysis of number of dystocia cases presented between January' 2006 and December' 2010 revealed that a total of 442 cases were referred for treatment. Further, during January' 2011 and March' 2012 alone, as many as 66 new cases were brought for treatment. It was also observed in the present study that number of dystocia cases presented increased with each year. It is possible that steady increase in number of dystocia cases with each year is possibly be due to an increase in canine population in cities and awareness of canine owners and breeders about availability of specialized obstetrical services.

Incidence of dystocia

In the present study, overall incidence of dystocia was determined to be 4.03 percent (Table. 1). This incidence was arrived at by analyzing over 10,957 cases of reproductive disorders in bitches presented for treatment during last 5 years. It has also been previously reported that overall incidence of dystocia in bitch is probably less than

5 percent (Root *et al.*, 1995; Stengel, 1997; Eneroth *et al.*, 2000; Chaves *et al.*, 2001; Gill, 2002; Trautmann and Nolte, 2003; Sparkes *et al.* 2006; Michel and Reichler, 2008, Sergio Serrano and Matthew Mcmillan, 2009). However, Bobic Gavrilovic *et al.* (2008) reported that 6.25 percent of bitches experienced dystocia out of 285 bitches. On the other hand, a significantly higher incidence of dystocia ranging from 16-42 percent has also been reported (Darvelid and Linde-Forsberg 1994; Ekstrand and Linde-Forsberg, 1994; Bergstorm *et al.*, 2006). These figures are probably too high and variation in overall incidence of dystocia reported by different workers is probably due to number of animals analyzed, mode of arriving at incidence and geographical area from where the study was reported. For example, some authors have reported incidence of dystocia as the number of abnormal whelpings in all whelpings (Forsberg and Pearson, 2007).

Incidence of different types of dystocia in bitches

In present study, fetal causes of dystocia were significantly less number of bitches (38.91%) when compared to maternal dystocia (Table 2). A lower frequency of fetal dystocia as compared to maternal causes has also been reported by Gaudet (1985) and Darveild and Forsberg (1994), Michel and Reichler, (2008), Sergio and Matthew, (2009), Oluwatoyin and Fayemi, (2011) and

Table 1. Incidence of dystocia

No of bitches presented for various reproductive consults	Bitches presented with dystocia	Incidence of dystocia
10957	442	4.03

Table 2. Incidence of maternal and fetal dystocia in bitches

Types of dystocia	No. of cases	Percentage
Maternal	270	61.09
Fetal	172	38.91
Total	442	100.00

Murthy (2011). A lower frequency of fetal dystocia in bitches as compared to maternal dystocia is in sharp contrast to the situation in uniparous animals wherein, fetal causes of dystocia are much more common than maternal causes. It is probable that long duration of parturition, number of litters to be delivered, nutrition as well as psychic factors on part of dam are responsible for a significantly higher incidence of maternal causes of dystocia in bitch. Further, it has been reported that because of short limbs, postural abnormalities of limbs in bitch rarely cause dystocia (Roberts, 1986).

Incidence of various causes of fetal dystocias in bitches

In present study, it was observed that deviation of head accounted for nearly two thirds of all cases of fetal dystocia. It was also observed that lateral deviation of head as a cause of fetal dystocia was recorded in a slightly higher number of animals as compared to ventral flexion (Table 3). In other studies, incidence of fetal malpresentation, position and posture were reported as 5.4 percent by Freak (1962), 13.5 percent by Gaudet (1985) and 24.7 percent by Darveild and Forsberg (1994). The most common reasons for fetal

Table 3. Incidence of fetal dystocia in bitches

Causes	Number of dystocia	Incidence (%)
1. Postural abnormalities of head		
a. Lateral flexion	62	36.05
b. Ventral flexion	47	27.33
2. Postural abnormalities of hind limbs		
a. Unilateral hind limb flexion	11	6.39
b. Bilateral hind limb flexion	21	12.21
3. Healed pelvic fracture	06	3.48
4. Fetal monsteries	05	2.91
5. Feo-pelvic disproportion	20	11.63
Total	172	100.00

dystocia are fetal oversize, fetal malpresentation, litter size (single pup pregnancies, hyperfoetation), fetal monstrosities, breech presentation of an oversized fetus and fetal death (Purohit and Guar, 2004; Linde Forsberg and Persson, 2007; Andrea and Küchenmeister, 2009; Mehrotra and Ravidutt, 2009; Oluwatoyin and Fayemi, 2011). Murthy (2011) observed that 54.54 percent fetal dystocia were due to postural abnormalities of head with 18.18 percent lateral deviation and 36.36 percent ventral flexion.

Factors influencing fetal dystocia Influence of breed

In present studies, 20 different breeds were presented with complaint of dystocia (Table-4). Most of the patients presented were either Pug (23.81%) or Labrador retrievers (18.01%). Dystocia in breeds like Dachshund (7.55%), German Shepherd (7.00%), Spitz (7.00%) and Beagle (6.40 %) were also encountered in a relatively high frequency. The incidence of dystocia was least in Penkingese (0.6%) and Shistzu (0.6%).

Several studies have documented a significant effect of breed of dam on incidence of fetal dystocia in canines. The breeds which have been reported to be particularly predisposed for fetal dystocia include Bull dogs (Smith 1965), Chihuahua, Dachshunds, Perkingese, Yorkshire Terrier, Miniature poodles and Pomeranian (Gaudet 1985), Dachshunds and Aberdeen Terrier (Arthur, 1989), Yorkshire Terriers 26 %, Corgis and Jack Russell Terriers 8% (Ekstrand and Linde-Forsberg, 1994), Dachshund 5.5%, Yorkshire Terrier 3.8%, Papillon 3.3%, Cavalier King Charles Spaniel 2.2%, Cocker Spaniel 2.2 %, Whippet 2.2 %, Standard Schnauzer 2.2 %, Bull Terrier 1.1%, Samoyed 1.1%, Australian Kelpie 1.1%, Golden Retriever 7.7%, Labrador Retriever 4.9%, German Shepherd 4.4 %, Boxer 2.8%, Tervueren 2.8%, and Mongrels 4.4% (Darvelid and Linde Forsberg, 1994), Golden retrievers 9.1% and Pekingese 85.7% (Gill, 2002), Boxer (Forsberg and Persson, 2007), Scottish terrier (Freak, 1948; Linde-Forsberg, 2003; Michel and Reichler, 2008). It is interesting to note that in present study, highest incidence of fetal dystocia was in Pug and

Labrador Retriever, the breeds which have not been reported to be particularly susceptible for dystocia. Pug and Labradors also happens to be favorite breeds among canine owners in Bengaluru city and therefore a higher frequency of fetal dystocia recorded in these breeds in present study may be due to more animal of these breeds in study area, rather than due to breed predisposition.

Of all fetal dystocia cases encountered in present study, 27.91 percent were in brachycephalic breeds (pug and boxers). Brachycephalic breeds like pugs and boxers are being increasingly reared

Table 4: Fetal dystocia in different breeds

Breeds	No. of cases	Percentage
Pug	41	23.81
Labrador retriever	31	18.01
Dachshund	13	7.55
GSD	12	7.00
Spitz	12	7.00
Beagle	11	6.40
Cocker spaniel	9	5.23
Great dane	9	5.20
Boxer	7	4.10
Miniature pincture	4	2.32
Mongrel	4	2.32
Golden retriever	3	1.74
Lhasa apso	3	1.74
Mudhol hound	3	1.74
Chihuahua	2	1.16
Mastiff	2	1.16
St. Bernard	2	1.16
Doberman	2	1.16
Pekingese	1	0.60
Shistzu	1	0.60
Total	172	100

by dog owners and most canine breeders seem to be aware of a higher risk of dystocia in brachycephalic breeds. There is a wide consensus among obstetricians that boxers and other brachycephalic breeds are predisposed for dystocia (Smith, 1965; Bennett, 1974; Roberts, 1986 ; Arthur *et al.*, 1989). Factors suggested to be responsible for predisposition of brachycephalic breeds to dystocia include a slack abdominal musculature making it impossible to lift fetus upto pelvic cavity (Bennet, 1974), a chord like structure crossing lumen of vagina ventrally just caudal to cervix (Smith, 1965) and peculiar

Table 7: Influence of parity on frequency distribution of fetal dystocia in bitches

Parity dystocia	Number of dystocias	Incidence (%)
1 st	75	43.61
2-3	56	32.55
4-5	25	14.53
>5	16	9.31
Total	172	100.00

Table 5: Influence of age on frequency distribution of fetal dystocia in bitches

Age (years)	Number of dystocias	Incidence (%)
< 2	72	41.86
2-4	80	46.52
4-6	15	8.72
6-8	3	1.74
> 8	2	1.16
Total	172	100.00

Table 6: Influence of size of on frequency distribution of fetal dystocia in bitches

Size of breed	Number of dystocias	Incidence (%)
Small (b.wt. < 10 kg)	86	50.00
Medium (b.wt. 10-25 kg)	73	42.44
Large (b.wt. 25-45 kg)	02	1.16
Giant (b.wt. > 45 kg)	11	6.40
Total	172	100.00

shape of fetal head making it difficult to enter pelvic inlet (Roberts, 1986 ; Arthur *et al.*, 1989).

A higher frequency of fetal dystocia was also encountered in Dachshunds (7.55%), a breed which has also been recognized to be predisposed for dystocia (Freak, 1948; Gaudet, 1985; Arthur *et al.*, 1989; Darvelid and Linde Forsberg, 1994). Although, mongrels constitute a significant number of canine populations in this country, fetal dystocia were recorded in only 4.20 percent. There have been reports in the past about low incidence of dystocia amongst Mongrels (Roberts, 1986 ; Darvelid and Forsberg, 1994).

Influence of age

The frequency of fetal dystocia in present study was found to be highest in bitches aged 2-4 years and it gradually declined with advancing age (Table 5). Bitches less than four years accounted for nearly 88.37 percent of fetal dystocia cases. There are no reports on influence of age of bitch on incidence of fetal dystocia and many reports which have tried to relate effect of age on dystocia have not specified the cause of dystocia. Nevertheless, Forsberg and Persson (2007) and Murthy (2011) have reported a higher incidence of dystocia in bitches under age of 4 years. On the other hand, results of present study are in contradiction with those of Freak (1962), Smith (1974) and Freak (1975) who reported that animals aged 5 years and above to be more prone for dystocia particularly due to uterine inertia. The low occurrence of dystocia in animals aged 6 years and above, observed in present study may probably be due to the fact that most canine owners prefer not to breed aged animals.

Influence of Size

In present study, size of breed was found to have a significant effect on incidence of fetal dystocia in bitches, incidence being significantly higher in small and medium sized breeds. Together, they accounted for nearly 92 percent of dystocia cases presented for treatment (Table 6). Apparently, this observation may suggest that small and medium sized breeds are more prone for fetal dystocia. The small and medium breeds were represented by 11 different breeds and these breeds also happen to be the preferred breeds among animal lovers and breeders in city of Bengaluru, India and therefore apparent higher incidence of dystocia in medium and large breeds may be more because of their higher population. On the other hand, Christiansen (1984) claimed that dystocia mainly occurred in miniature breed because their pups were relatively bigger as compared to medium and large sized breeds. Similarly, Chaves (2001) reported that 66.66 percent of dystocia cases were diagnosed in small breed dogs, 23.33 percent in medium breed dogs and 10 percent in large breed dogs.

Influence of parity

In present study, 43.61 percent of fetal dystocia cases observed were primiparous and rest had delivered 1-8 times. The incidence of fetal dystocia decreased progressively with increase in parity and least incidence (9.31%) was recorded in animals with more than 5 deliveries (Table 7). The results of present study are in close conformity with those of Michel and Reichler (2008) who reported incidence of dystocia in primipara as 41.00 percent. However, Oluwatoyin and Fayemi (2011) and Murthy (2011) claimed that highest cases of dystocia recorded in primiparous bitches. Darveild and Forsberg (1994) also reported 28 percent of bitches experiencing dystocia had not littered before. However, these reports do not specify the cause of dystocia, fetal or maternal in origin.

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