RESEARCH ARTICLE

Breeding and Reproductive Health Profiles in Pet Canine Females

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Abstract

The reproductive health and breeding status was studied in 124 pet dogs (121 females, 3 males) presented at the Veterinary Clinical Complex of the College of Veterinary Science and A.H. Anand. It comprised a majority of Labradors (32.26%), followed by German Shepherds (16.13%), Pomeranians (12.90%), Mongrels (10.48%), Pugs (9.68%), and others. Body condition-wise, 10.48% bitches were fatty, 68.55% normal, 13.71% below average, and 7.26% were debilitated. All three males were conditioned enough. Among 121 bitches, 53 were nulliparous, 27 primiparous, 32 pluriparous, and 9 were of unknown parity. Out of 124 dogs examined, 117 (94.36%) were free from ectoparasites, whereas 7 (5.64%) had ticks' infestation. Among the 121 bitches, 69.42% were cyclic, 13.22% acyclic, and 17.36% with unknown status. Expression of behavioural proestrus and estrus was intense and noticeable in 66.95%, subtle in 27.27% and unknown in 5.79% bitches. Reaction by the bitch to the dog was reported to be poor/refractory, good/amicable and ferocious in 9, 57 and 9 bitches, respectively. Clinical reproductive entities (207) included the pregnancy failure (16.43%) to be the highest, followed by pregnancy (12.56%), proestrus (11.11%), open pyometra (7.73%), seeking counselling (7.25%), misalliance (5.80%), vaginal tumours (4.83%), pseudopregnancy (4.35%), close pyometra (1.93%) and others. Ten (83.33%) genital discharge samples from 12 bitches having open pyometra yielded bacterial isolates with *Corynebacterum spp*. being the predominant and most isolates were sensitive to Amikacin, Chloramphenicol, Gentamicin, while resistant to Ampicillin.

Keywords: Breeding surveillance, Pet canines, Reproductive problems.

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Introduction

An increased pet dog keeping as a companion and/or protection animal has awakened the pet keepers for reproductive wellbeing concerns about the attainment of puberty, varying breeding season, uncertainties of proestrus/estrus onset, mating behavior, inter-locking time, pregnancy period, breeding challenges, etc., which needs to be explored and addressed. Improper timing of mating is considered to be the essential cause of breeding failure in the bitch (Concannon *et al*., 1993; Jaller *et al.,* 2017). Dog owners provide a limited number of services for their studs (Antonov, 2017). So far as reproductive behavior is concerned, among the bitches reared by the pet owners in and around Anand, no systemic study has ever been undertaken to explore their reproductive failure problems. Hence the present study was undertaken to assess breeding and reproductive health profiles in pet canine females and to undertake dog keepers' counseling.

Materials and Methods

A total of 124 dogs (121 females, 3 male) registered at the VCC of the College of Veterinary Science and Animal Husbandry, AAU, Anand during the year 2019-21 were examined for their reproductive health, and their owners were asked to furnish the specific information regarding the breeding profiles including approximate age, parity, estrus and mating behavior, whelping outcome, breeding season etc. Vaginal discharge samples were swabbed from 12 bitches having unhealthy discharge for cultural isolation and antibiotics sensitivity testing was performed. The bitches yielding any culture were treated using the sensitive antibiotics and followed for the next estrus, mating, and pregnancy. Data were analyzed using descriptive statistics for the number and percentage frequency of various aspects included in the study.

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Results and Discussion

The breed-wise distribution of a total of 124 (121 female; 3 male) dogs presented from Anand (55.64%; 69) and outstation (44.36%; 55) studied revealed that Labradors (32.26%; 40) were the highest and the French Mastiff was the lowest (0.81%; 1) (Table 1).

The majority of pet keepers (83.06%; 103) managed the dogs themselves, whereas the rest (16.94%; 21) depended on their caretakers. The females' reproductive history was available with owners up to 78.23% (97) cases, and the rest (12.90%; 16) of the owners could not provide any clinical history, whereas 8.87% (11) owners were dependent on their caretakers. None of the dogs were either registered or certified with respect to their pedigree information. 10.48% (13) bitches were observed to be fatty, 68.55% (85) normal, 13.71% (17) below average, and 7.26% (9) debilitated, with males having good body condition. Out of 124 dogs examined, 117 (94.36%) were free from ectoparasites, whereas 7 (5.64%) had ticks' infestation.

Among the bitches (n = 121) presented, 53 (43.80%) were nulliparous, 27 (22.31%) were primiparous, 32 (26.45%) were pluriparous, and 9 (7.44%) were of unknown parity. Among the bitches presented, 84 (69.42%) were cyclic, 16 (13.22%) acyclic, and 21(17.36%) in unknown status. Expression of behavioral proestrus and estrus was found to be intense and noticeable in 81 (66.94%), subtle in 33 (27.27%), and unknown in 7 (5.79%) bitches. The distribution of reproductive health profiles (207) found based on clinical entities in 121 bitches were as given below in Table 2.

Among 121 bitches registered, a reaction by the bitch to the dog was reported to be poor/refractory, good/amicable, and ferocious in 9 (7.44%), 57 (47.11%), and 9 (7.43%) animals, respectively. However, in the remaining 46 (38.02%) animals, owners could not provide any information. The details were not available with dog keepers with respect to the breeding behaviors including copulatory tie, prolonged or excessive proestrual vaginal bleeding, expression of estrus signs, etc.

Among the bitches presented, 29 (23.97%) bitches were reported as being kept away from mixing with males during estrus to avoid pregnancy and unwanted pups. Only three dogs were presented during the period under report having an issue of failure of breeding capability, monorchidism, and shy-breeder due to psychosis, one case each.

Canine pyometra, a sequelae of cystic endometrial hyperplasia, is mostly associated with other similar uterine pathological conditions, *i.e.,* hydrometra, mucometra, and

Table 1: Breed-wise pet dogs presented at VCC, Veterinary College, Anand

	Number			
Breeds	*Female*	*Male*	*Total*	*Per Cent*
Labrador	39	1	40	32.26
German shepherd	19	1	20	16.13
Pomeranian	15	1	16	12.90
Mongrel	13	0	13	10.48
Pug	12	0	12	9.68
Golden retriever	7	0	7	5.65
Doberman	5	0	5	4.03
Lhasa apso	5	0	5	4.03
Rottweiler	3	0	3	2.42
Siberian husky	2	0	2	1.61
French mastiff	1	0	1	0.81
Total	121	3	124	100.00

Table 2: Clinical Reproductive health entities (207) found in bitches (n = 121)

Sr. No.	*Conditions*	*Bitches*	*Percent*
1	Non-pregnancy	34	16.43
2	Pregnancy (with breeding history)	26	12.56
3	Proestrus	23	11.11
4	Open pyometra	16	7.73
5	Counselling	15	7.25
6	Misalliance	12	5.80
7	Vomiting and Itching	10	4.83
8	Vaginal growth/tumour	10	4.83
9	Pseudo-pregnancy (With signs)	9	4.35
10	Pregnancy termination	8	3.86
11	Whelping (with postpartum straining with no foetus)	5	2.42
12	Pregnancy (with unknown breeding history)	4	1.93
13	Close pyometra	4	1.93
14	Skin infection	4	1.93
15	Pseudo-pregnancy (Without signs)	4	1.93
16	Pregnancy failure (with repeated services)	4	1.93
17	End of estrus	3	1.45
18	Vaginal stricture	2	0.97
19	Whelping (with foetal lodgement)	2	0.97
20	Hair falling	2	0.97
21	Perineum / vaginal abscess	2	0.97
22	Bladder Stone	1	0.48
23	Foetal resorption	1	0.48
24	Abdominal enlargement (with no pregnancy)	1	0.48
25	Pyrexia (postpartum)	1	0.48
26	Post-breeding vaginitis	1	0.48
27	Abortion	1	0.48
28	Prolonged gestation	1	0.48
29	Non-acceptance of male	1	0.48
	Total	207	100.00

chronic endometritis (Kumar and Saxena, 2018). Pyometra can be diagnosed as early as the end of the estrous cycle but is mostly diagnosed during the first four weeks after the last estrous cycle (Antonov *et al.,* 2015). As observed in the present study, canine pyometra is commonly reported in mature bitches ranging from 4 to 16 years, being the most common at the age of 7.5 years with regular and repeated estrous cycle (Hadiya *et al.,* 2021). The occurrence of pyometra was reported as 19 % in bitches below 10 years of age and 20% in older female dogs (Jitpean *et al.,* 2014).

Cultural Isolation from Genital Discharge

A total of 20 (16.53%) bitches had either open (13.22%; n = 16) or close (3.31%; n = 4) pyometra. Among them, a total of 12 bitches of different breeds having open pyometra could be subjected to cultural isolation and antibiotic sensitivity testing from unhealthy genital discharges or pus samples and follow up to understand the extent of non-specific genital infections in canine infertility and its management. Out of 12 samples studied, 10 (83.33 %) samples were found positive for cultural growth, and *Corynebacterium* (33.66 %; 4) was found to be prevalent to the greatest extent. The remaining cultures found in descending order of their occurrence were *Staphylococcus spp*., Gram-negative rods, and *Pseudomonas spp*. (16.66%, 2 each), and *Streptococcus spp*. and Gram-negative bacilli (8.33%, 1 each).

Corynebacterium spp., Staphylococcus spp., gram -ve rods and *Pseudomonas spp*. were the most isolated bacterium in our study, which was consistent with the results of previous studies (Bassessar *et al.,* 2013; Khandekar *et al.,* 2015; Liao *et al.,* 2020). According to Liao *et al.* (2020), *E. coli* and other bacteria isolated from pyometra were identical or like that isolated from urinary tract infections or feces in the same bitch. They may move from the intestine to the urogenital tract and cause infections.

Among the unhealthy genital discharges found positive for cultural growth (10), 16.67% (n = 2) samples had mixed cultures, whereas 80.00% (n = 08) samples had single culture. Among the cultures tested for their antibiotic sensitivity spectrum, the amikacin, chloramphenicol, and gentamicin were found to be sensitive up to 33.66% (n = 4) each, followed by Amoxyclav, ceftriaxone, imipenem, meropenem, and norfloxacin 16.67% (n = 2) each, and Ampicillin, Cefixime, and Cefepime 8.33% (n = 1) each. Ampicillin was found to be resistant for a maximum of 8 cultures obtained. *Corynebacterium spp., Staphylococcus spp*., gram -ve rods, *and Pseudomonas spp.,* the most isolated bacteria in the present study, were consistent with the results of previous studies (Fransson *et al.,* 1997; Coggan *et al.,* 2008; Bassessar *et al.,* 2013; Khandekar *et al.,* 2015; Liao *et al.,* 2020). According to Lion *et al.* (2020) and Wadas *et al.* (1996), *E. coli* and other bacteria isolated from pyometra were identical or similar to those isolated from urinary tract infections or feces in the same bitch.

The present findings revealed the highest cases of pregnancy failure followed by open pyometra, counseling, pseudopregnancy, proestrus, misalliance, whelping, vaginal tumors, and others. The genital discharge yielded bacterial isolates, with *Corynebacterium spp*. being predominant, with most of the isolates being sensitive to amikacin, chloramphenicol and gentamicin.

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