

A Retrospective Study of Reproductive Conditions and Requested Procedures in Dogs in South Western Nigeria: 1999-2008

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Abstract: The reproductive conditions and requested procedures encountered in dogs in Southwestern Nigeria were surveyed using the clinical records of the state veterinary hospitals and some private veterinary clinics from January 1999 to December 2008 in order to document and compare their prevalence's. The most frequent reproductive conditions and requested procedures of dogs encountered were: requests for orchidectomy 33.0%, Transmissible Venereal Tumor (TVT) 10.1%, requests for pregnancy diagnosis 8.1% and oestrus detection 6.1%, mastitis 5.3%, abortion 4.5%, urogenital tract infection 4.1%, orchitis 3.4%, metritis 3.3%, dystocia 2.9% and infertility 1.6%. The female dogs were presented with significantly more reproductive conditions and requested procedures (54.1%) than the male dogs (45.2%) and missing data (0.7%) ($p < 0.05$). The breeds of dogs presented at the clinics and the distribution of the reproductive conditions and requested procedures were: Alsatian 27.4%, Rottweiler 2.3%, Nigerian local dog 28.0%, Bull Mastiff 0.4%, Pit bull 0.5%, Terrier 0.2%, Doberman 0.2%, Crossbreds 6.7, Great Dane 0.3%, Boxer 0.2%, Boer Bouele 0.3%, Labrador 0.1% and missing data 34.4%. The prevalence of diseases of reproduction and requested procedures did not follow any specific pattern during the period studied but the highest prevalence was recorded in year 2008 due to problems with record keeping in some states. Sequel to the results above, veterinarians in this region of country are therefore, warned and prepare of possible increase in the prevalence of diseases of reproduction and requested procedures due to increase in the importation of exotic breeds of dogs.

Key words: Retrospective, study, reproduction, conditions, procedures, dogs, South West

INTRODUCTION

Dogs are the most primitive companion of man and have been domesticated as early as 8,000 BC (Zeuner, 1963; Epstein, 1971; Oyeyemi *et al.*, 2000). They are used for several purposes including sports, hunting, guide, guard, companionship, recreational purposes, biomedical research and models to study human diseases (Pfaffenberger and Scott, 1975; Oben and Oben, 1977; Johnson, 1999). This is because they share many biomedical and physiological characteristics with human (Johnson, 1999).

There are three broad classes of dogs in Nigeria. The exotic breeds which are pure bred dogs that have certain inherited traits and skills. They are imported into the country and some are now well adapted to the climate or weather of Nigeria while some have not (Ajala, 2010). Examples are German shepherd (Alsatian), Rottweiler, Doberman, Boer Bouele, Ridge back, Bull mastiff, Pit bull, Neopolitant mastiff and the Terriers. The other two classes are the Nigerian local breeds and the cross breeds of varying degree of two different pure breeds. For

example, crossing of pure Alsatian and the Nigerian local breed, Alsatian and Rottweiler (Ajala, 2010). The dogs when they are not spayed or neutered are fertile creatures which reach reproductive maturity or puberty before 2 years of age (Nelson and Couto, 2003). The age of reproductive maturity varies greatly and depends on environmental factors, breed size and nutrition (Sokolowiski *et al.*, 1997). The small breeds reach puberty at an earlier age than the large breeds of dogs (Pavia, 2009). Once matured female dogs have two to three oestrous period in a year but some are monoestrus (Floss and Root-Kurtritz, 2009; Davol, 2000; Nelson and Couto, 2003). The interoestrous period varies from 4-12 months (Nelson and Couto, 2003). The bitches have the potential to produce multiple litters of puppies per year (Pavia, 2009) but sometimes problems can develop leading to infertility or sterility. In the female infertility can manifest as failure to cycles, aberration of the oestrous cycle, aberration of the oestrus period, failure to conceive, prenatal death which can be due to abortion, embryonic death, embryonic resorption or foetal death, perinatal death which can be due to still birth or neonatal mortality

(Noakes *et al.*, 2001). Male infertility can manifest as disturbances of the production, transportation and or storage of spermatozoa, aberration of libido, partial or complete inability to mate and problems of the accessory glands (Nelson and Couto, 2003).

Infertility of the both male and female dogs can have complex aetiology involving several factors singly or in combination. They are categorized as structural including congenital, acquired, neoplastic diseases and trauma affecting the anatomy of the reproductive tract (Arthur *et al.*, 1989). Functional including endocrinological abnormalities or malfunctions and inflammatory lesions (Noakes *et al.*, 2001). Infectious for example *Brucella canis* infection which may be sexually transmitted leading to infertility in the male by causing low sperm count or poor mobility and abortion in the female dogs (Okoh *et al.*, 1978; Berthelot and Garin-Bastuji, 1993). Parasitic diseases such as trypanosomiasis (Noakes *et al.*, 2001). Managerial problems of which poor timing of mating was identified by (Nelson and Couto, 2003) as the main managerial failure leading to the failure of conception in the female dog. This usually occurs because of lack of understanding of the reproductive cycle of the bitch. Other causes of infertility in the female are abortion of unknown causes, mastitis and eclampsia.

In practice, the common diseases of reproduction of dogs that have been encountered include: Transmissible Venereal Tumour (TVT) (Moulton, 1961; Hipping, 1966; Idowu, 1983; Smith and Washbourm, 1998), Orchitis (Schiemann and Staak, 1971; Brum, 2010), Scrotal dermatitis (Riser, 1975), Dystocia (Johnston, 1986; Day, 2007), Vaginitis (Hirsh and Wiger, 1977; Spielman, 2010), Pyometra (Hardy and Osborne, 1974; Olson *et al.*, 1986), Metritis (Noakes *et al.*, 2001) and Pseudopregnancy (Jochle *et al.*, 1978; Gobello *et al.*, 2001).

The procedures commonly requested for by pet owners are orchidectomy (Morrow, 1986; Oyeyemi *et al.*, 2000), oestrus detection (Schutte, 1967; Davol, 2000), pregnancy detection (Concannon *et al.*, 1983; Noakes *et al.*, 2001), ovariohysterectomy (Morrow, 1986; Day, 2007).

Reproductive diseases and requested procedures are becoming a major concern to dog owners and veterinarians in Nigeria because of the increasing values of dogs especially the exotic breeds. This study was conducted to generate a data bank on the prevalence of reproductive conditions and requested procedures in dogs in the Southwestern area of Nigeria which can serve as reference for Veterinarians and pet owners.

MATERIALS AND METHODS

Clinical records were obtained from Veterinary Clinics and hospitals in Oyo, Ondo, Osun, Lagos and Ekiti states. The following information were obtained for the period between January 1999 to December 2008: Date of presentation, the breed, sex, age, parity, reproductive conditions and requested procedures. The different rate of conditions and requested procedures were calculated in percentages. The differences between paired means were determined using the least significant differences (Bamgboye, 2006).

RESULTS

The reproductive conditions and procedures encountered in dogs in South western Nigeria between 1999 and 2008 in the male were: Orchidectomy, TVT, urogenital tract infections, orchitis, infertility, paraphimosis, scrotal dermatitis, scrotal wound, posthitis, sertoli cell tumour, cryptorchidism, phimosis, post orchidectomy complications, penial bleeding, balamitis, abnormal preputial discharge, prostatitis and hernia. In the female, the list of the reproductive conditions and requested procedures were: TVT, pseudopregnancy, pregnancy diagnosis, oestrus detection, mastitis, abortion, urogenital tract infections, metritis, leptospirosis, infertility, OVH, dystocia, vaginal prolapse, post partum check up, agalactia, pyometra, mating, fading puppy, still birth, brucellosis, retained placenta, extra pendulous mammary teat, macerated foetus, premature birth, whelping, mammary gland tumour, vaginitis, vulvovaginitis, sub involution of placenta sites, canine eclampsia (paresis), vaginal hyperplasia and traumatic mating.

The most frequent reproductive conditions and requested procedures encountered were: request for orchidectomy 33.2%, TVT 10.1%, request for pregnancy diagnosis 8.1% and oestrus detection 6.1% and mastitis, 5.3%, abortion 4.5%, urogenital tract infection 4.1%, orchitis 3.4%, Metritis 3.3% while all other less frequent conditions accounted for 21.4% and missing data 0.7% (Table 1-3).

There were significantly more reproductive conditions of dog in the female (54.1%) than in the male (45.2%) and missing data (0.7%) ($p < 0.05$) in South Western Nigeria (Table 1-3).

The following were breeds of dogs encountered in the South Western Nigeria between January 1999 and December, 2008. Alsatian, Rottweiler, Nigerian Local, bull mastiff, pit bull, terrier, doberman, great dane, boxer, boerboele, labrador and crosses of different degrees of these

Table 1: Occurrence of reproductive conditions and procedures in both male and female dogs in South Western Nigeria (frequency above 3.0%)

Reproductive conditions and procedure	Frequency n (%)		
	Male	Female	Total
Orchidectomy	346 (33.0)	-	346 (33.0)
TVT	11 (1.1)	95 (9.0)	106 (10.1)
Pregnancy diagnosis	-	85 (8.1)	85 (8.1)
Oestrus detection	-	64 (6.1)	64 (6.1)
Mastitis	-	56 (5.3)	56 (5.3)
Abortion	-	47 (4.5)	47 (4.5)
Urogenital tract infections	23 (2.2)	20 (1.9)	43 (4.1)
Orchitis	36 (3.4)	-	36 (3.4)
Metritis	-	35 (3.3)	35 (3.3)
Sub-total	416 (39.7)	402 (38.2)	818 (77.9)

Table 2: Occurrence of reproductive conditions and procedures in both male and female dogs in South Western Nigeria (frequency of 0.5-2.9%)

Reproductive conditions and procedure	Frequency n (%)		
	Male	Female	Total
Leptospirosis	-	5 (0.5)	5 (0.5)
	1 (0.1)	16 (1.5)	17 (1.6)
Paraphimosis	10 (1.0)	-	10 (1.0)
OVH	-	7 (0.7)	7 (0.7)
Dystocia	-	30 (2.9)	30 (2.9)
Vaginal prolapse	-	8 (0.8)	8 (0.8)
Pseudo-pregnancy	-	20 (1.9)	20 (1.9)
Scrotal dermatitis	17 (1.6)	-	17 (1.6)
Post partum check up	-	8 (0.8)	8 (0.8)
Agalactia	-	7 (0.7)	7 (0.7)
Pyometra	-	12 (1.1)	12 (1.1)
Mating	-	5 (0.5)	5 (0.5)
Fading puppy	-	5 (0.5)	5 (0.5)
Scrotal wound	5 (0.5)	-	5 (0.5)
Still birth	-	6 (0.6)	6 (0.6)
Posthitis	6 (0.6)	-	6 (0.6)
Brucellosis	-	6 (0.6)	6 (0.6)
Retained placenta	-	6 (0.6)	6 (0.6)
Sub-total	39 (3.8)	141 (13.7)	180 (17.5)

Table 3: Occurrence of reproductive conditions and procedures in both male and female dogs in South Western Nigeria (frequency below 0.5%)

Reproductive conditions and procedure	Frequency (%)		
	Male	Female	Total
Extra pendulous mammary teat	-	1 (0.1)	1 (0.1)
Setoli cell tumour	3 (0.3)	-	3 (0.3)
Cryptorchidism	4 (0.4)	-	4 (0.4)
Macerated foetus	-	2 (0.2)	2 (0.2)
Premature birth	-	2 (0.2)	2 (0.2)
Phimosis	2 (0.2)	-	2 (0.2)
Whelping	-	1 (0.1)	1 (0.1)
Post orchidectomy complications	1 (0.1)	-	1 (0.1)
Mammary gland tumour	-	4 (0.4)	4 (0.4)
Vaginitis	-	3 (0.3)	3 (0.3)
Vulvovaginitis	-	4 (0.4)	4 (0.4)
Sub involution of placenta site	-	1 (0.1)	1 (0.1)
Canine eclampsia (Paresis)	-	3 (0.3)	3 (0.3)
Penal bleeding	2 (0.2)	-	2 (0.2)
Balanitis	3 (0.3)	-	3 (0.3)
Vaginal hyperplasia	-	2 (0.2)	2 (0.2)
Abnormal preputial discharge	2 (0.2)	-	2 (0.2)
Traumatic mating	-	2 (0.2)	2 (0.2)
Prostatitis	2 (0.2)	-	2 (0.2)
Hernia	1 (0.1)	-	1 (0.1)
Sub-total	19 (1.7)	23 (2.2)	42 (3.9)
Final total (Table 1-3)	474 (45.2)	566 (54.1)	1047 (100.0)
		Missing data 7 (0.7)	

Table 4: Percentage distribution of reproductive conditions and procedures in dogs in South Western Nigeria between 1999 and 2008

State	Percentage reproductive condition n (%)
Oyo	382 (36.5 ^a)
Ogun	118 (11.3 ^b)
Osun	165 (15.8 ^c)
Ondo	136 (13.0 ^d)
Ekiti	136 (13.0 ^d)
Lagos	107 (10.2 ^e)
Missing data	3 (0.3)
Total	1047 (100.0)

Percentages with different superscripts are significantly different from each other (p<0.05)

Table 5: Percentage distribution of reproductive conditions and proceeding of dogs in South Western Nigeria (1999-2008)

Years	Frequency (%)
1999	117 (11.2)
2000	132 (12.6)
2001	108 (10.3)
2002	103 (9.9)
2003	85 (8.1)
2004	62 (5.9)
2005	73 (7.0)
2006	67 (6.4)
2007	79 (7.5)
2008	218 (21.0)
Missing data	3 (0.3)
Total	1047 (100.0)

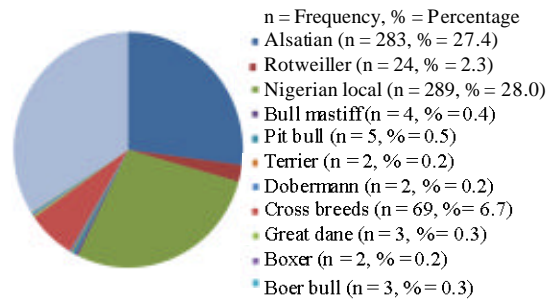


Fig. 1: Distribution of reproductive conditions of dogs between 1999 and 2008 among breeds (Labrador: n = 1, % = 0.1; Missing data: n = 360, % = 34.4; Total: 1047, % = 100)

pure breeds (Fig. 1). The Alsatian (27.4%) and the Nigerian Local (28.0%) dogs are the two major breeds of dogs with the highest reproductive cases (Fig. 1).

Oyo state had the highest occurrence of reproductive conditions of dogs (36.5%) followed by Osun (15.8%), Ondo and Ekiti states (13.0%) then ogun (11.3%) and lagos having the lowest (10.2%) and missing data 3 (0.3%) (Table 4).

The annual percentage distribution of reproductive conditions was highest in the year 2008 (21.0%) and the lowest in the year 2004 (5.9%) (Table 5) and the monthly distribution was highest in September (10.7%) and lowest in July (6.7%) (Table 6).

Table 6: Monthly distribution of reproductive conditions and procedures in the South Western Nigeria (1999-2008)

Years	Frequency (%)
January	102 (9.80)
February	71 (6.80)
March	82 (7.90)
April	90 (8.60)
May	72 (6.90)
June	72 (6.90)
July	70 (6.70)
August	99 (9.50)
September	112 (10.70)
October	92 (8.80)
November	95 (9.15)
December	87 (8.30)
Missing data	3 (0.30)
Total	1047 (100.00)

Percentages with different superscripts are significantly different from each other ($p < 0.05$)

DISCUSSION

The list of common reproductive conditions and procedures in South Western Nigeria from January 1999 to December 2009 generated from this study is similar except with some new additional conditions, to those generated from Edo state of Nigeria from 1992-1995 by Oyeyemi *et al.* (2000). The new conditions show that some reproductive conditions which were not common before are now being introduced because of the increased importation of exotic breeds of dogs couple with uncontrolled breeding activities in the country. The distribution of reproductive conditions and procedures of dogs in the South Western Nigeria did not follow a particular trend during the period of this study. This might be due to the fact that the veterinary operations in some states in the region were disrupted because of some industrial disputes between the veterinarians and the Government and so many cases were not reported. It will be observed that in 2008, the number of reproductive conditions and requested procedures recorded the highest frequency. This means that those state clinics and hospitals having problems had started operating better and with the importation of more breeds of dogs, reproductive problems might have increased. Reproductive conditions and procedures were reported throughout the months of the year but had the highest frequency during the month of September.

The female reproductive conditions and requested procedures in the dogs were higher than those of the male. This finding might have been as a sequel of the usual higher attention paid to female reproduction (Zemjanis, 1970) although, Oyeyemi *et al.* (2000) reported more reproductive cases in the males than in the female dogs. The higher prevalence of TVT in the female than in the male in this study is contrary to the observations of

Morrow (1986) that there seems to be no sex pre-dilection in the occurrence of TVT. However, this result may be due to the fact that castration accounts for 33.0% of the male cases and this could have reduced the incidence of TVT in the male because TVT is a disease of sexually active dogs and castration, certainly affects sexual activity.

Oyo state recorded the highest reproductive conditions and requested procedures followed by Osun, Ondo, Ekiti and Lagos states. The differences might be as a result of differences in the appreciation of veterinary care for pets and inadequate attention by people especially in mega cities like Lagos where because of their business schedules, many pet-owners do not have time to visit the veterinary clinics or hospitals, resulting in many cases not being captured.

CONCLUSION

In this survey, some breeds that have been known to be prone to dystocia for example, the Bull Mastiff, Pit Bull and Boston Terrier were among the breeds found in this region (Barber, 2003; Day, 2007). Therefore, pet owners and veterinarian in this region should be informed and so prepared for the possible increase in the prevalence of diseases and conditions of reproduction which used to have low prevalence such as dystocia.

RECOMMENDATIONS

There were some missing data in this study which might be due to inadequate record keeping of most clinics in the South Western region of Nigeria. It is therefore, recommended that the record section of all veterinary clinics and hospitals should be computerized and many more items included in the data base. Some additional data to be included are: breed, usage, nutrition, parity and age of dogs at presentation.

It is also recommended that the state governments in this region should give better attention to veterinary healthcare by providing better amenities to work with.

It was also discovered that there was no follow up of all reproductive cases treated in all the veterinary hospitals. Therefore, complications and the impact of interventions on future fertility of the dogs could not be studied. It is recommended that proper follow up should be given to all cases of reproduction treated in dogs and the clients should be made to comply.

It was observed that most dog owners and breeders seek veterinary help when they have emergencies. It is recommended that more enlightenment campaigns should be done in this region to educate clients on the importance of routine veterinary care and breeding education for their dogs.

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