



Bacteriology of the Anterior Genitalia of the Domestic House Cat: Aetiology of Non-Specific Infection

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SUMMARY

The bacteriology of the anterior genitalia of the domestic house cat was determined using vaginal swabs collected from sixty apparently healthy female domestic cats (20 kittens, 20 pregnant and 20 non-pregnant adults). The swabs were streaked on blood agar, Mac Conkey agar and eosin methylene blue agar plates which were all incubated at 37°C for 24 – 48 hours. Biochemical tests were also used to determine the bacterial isolates. The species of bacteria isolated were; coagulase negative Staphylococci 31 (25.2%); α -haemolytic Streptococci 21 (17.1%); *Actinomyces pyogenes* 21 (17.1%); *E. coli* 16 (13.0%); *Bacillus* species 12 (9.7%); β -haemolytic Streptococci 9 (7.3%); *Proteus* species 8 (6.5%) and *Staphylococcus aureus* 5 (4.1%). These organisms could therefore be regarded as part of the normal aerobic vaginal flora of domestic cats found in the semi-arid region of north-eastern Nigeria.

KEY WORDS: Domestic cats, Aerobic bacteria, Anterior genitalia, Semi-arid region, Nigeria.

INTRODUCTION

A variety of organisms are normal inhabitants of the vagina of dogs and cats (Baba et al., 1982; Clemetson and Ward 1990). Clemetson and Ward (1990), demonstrated various bacterial organisms within the normal genital tract of queens, which were considered to be the normal flora of the genital tract and these include both aerobic and anaerobic bacteria. As with other areas of the body, the presence of normal flora in the genital tract appears to have a protective role (Oliver, 2003). Variations exist in the bacterial flora of the vagina. There are tendencies for various breeds to differ in their vaginal flora, it also varies during reproductive cycles (Bjurstrom and Linde-Forsberg, 1992; Schulthesis et al., 1999; Mshelia et al., 2001).

Infectious agents are the most common cause of female reproductive disorders in domestic carnivores (Troy and Herron, 1986; Barsanti, 1984). Vaginal and uterine cultures can help to identify the etiologic causes of vaginitis (Hirsh and Wiger, 1977; Doig et al., 1981), neonatal septicaemia (Komblatt et al., 1983; Burke, 1976) and infertility (Johnston, 1984). The study of the genital tract of the queen is to help forestall problems associated with infertility, abortions and infections of the genital tract.

This study aims to determine the normal aerobic bacteria flora of the anterior vagina of apparently healthy female domestic cats in the

semi-arid region of north-eastern Nigeria and also provide valuable information on the significance of the bacterial micro organisms in the vagina of the domestic cat.

MATERIALS AND METHODS

Study area

Maiduguri is the capital and the largest urban centre of Borno state, north eastern Nigeria. The state lies between latitude 11° 32' north and 11° 40' north and longitude 13° 20' East and 13° 25' East; and between the Sudan savannah and Sahel savannah vegetation zones, characterized by short rainy season of 3-4 months (June-September) followed by a prolonged dry season of more than 8 months duration (Udo, 1981).

Sample size

A total of sixty apparently healthy female domestic cats (kittens, pregnant and non-pregnant queens) were randomly selected from households owning cats in various locations in Maiduguri metropolis. These cats were evaluated for aerobic bacterial microflora from May–October 2006. The cats ranged in age from 5 weeks to 3 years and have both indoor/outdoor access. Pregnancy was determined by abdominal palpation (Pedersen, 1991).

Sample collection

Cats to be sampled were properly restrained and the vulva was disinfected with a mild disinfectant (savlon®). Vaginal swab was collected from each female domestic cat by separating the labia of the vagina, inserting the sterile cotton swab (Medical wire and equip co. Corsham England) and rotating it at 3600 against the vaginal wall. The swab was removed from the vagina and transported to the laboratory immediately.

Isolation of aerobic bacteria

Vaginal swabs were streaked on 5% sheep blood agar, Mac Conkey agar and eosin methylene blue agar plates. All plates were

incubated at 37°C for 24–48 hours. Where there was more than one type of colony, they were subcultured to obtain pure cultures. Further tests employed for the identification of the colonies were gram staining, catalase, coagulase and biochemical tests based on standard procedures (Cowan and Steel, 1993; Carter and Chengappa, 1991).

RESULT AND DISCUSSION

Fifty six swab samples yielded bacterial growth with a total of one hundred and twenty three isolates and four swab samples did not yield any bacterial growth. Six genera of bacteria were isolated and these included *Staphylococcus*, *Streptococcus*, *Actinomyces pyogenes*, *Bacillus*, *Proteus* species and *Escherichia coli*. Only *Staphylococcus*, *Streptococcus*, *Actinomyces pyogenes*, *Bacillus* and *E. coli* were common to the three groups. Coagulase negative *Staphylococcus* was the most common bacteria 31 (51.6%) isolated from the vagina of these cats. The next most common bacteria was *E. coli* with 16 (26.6%) growth. The Kittens had the highest number of bacteria 45 (36.5%) when compared to the pregnant and non-pregnant adult (Table 1).

TABLE I: Bacterial isolates from vaginal cultures of female domestic cats

BACTERIA	Number of isolates (%)*			Total
	Kittens (n = 20)	Pregnant queens (n = 20)	Non – pregnant adult (n = 20)	
Coagulase negative <i>Staphylococci</i>	12 (26.7)	7 (20.6)	12 (27.3)	31
<i>E. coli</i>	8 (17.8)	4 (11.8)	4 (9.1)	16
<i>Corynebacterium</i> <i>pyogenes</i>	7 (15.5)	5 (14.7)	9 (20.4)	21
α -haemolytic <i>Streptococcus</i>	6 (13.3)	8 (23.5)	7 (15.9)	21
<i>Proteus</i> species	5 (11.1)	0	3 (6.8)	8
<i>Bacillus</i> species	4 (8.9)	7 (20.6)	1 (2.3)	12
β – haemolytic <i>Streptococcus</i>	3 (6.7)	1 (2.9)	5 (11.4)	9
<i>Staphylococcus</i> <i>aureus</i>	0	2 (5.9)	3 (6.8)	5
Total	45 (100)	34 (100)	44 (100)	123

Coagulase negative *Staphylococcus* spp 31(51.6%) and *E. coli* 16 (26.6%) were the commonest isolates. These isolates as well as

Actinomyces pyogenes and *Bacillus* spp were common to the three groups. These organisms seem to be common among the cats sampled and could therefore be considered as part of the aerobic bacterial flora of the female domestic cats. The frequency and types of bacteria from the domestic cats in our study is in accordance with reports on the flora of clinically healthy domestic queens (Cox et al.,1985;Clemetson and Ward,1990; Howard et al.,1993). In general, the types of bacteria identified in the vagina of domestic cat were similar to those isolated from healthy bitches (Platt and Simpson, 1974; Hirsh and Wiger, 1977; Ling and Ruby, 1978; Olson and Mather, 1978, Allen and Dagnall, 1982; Baba et al., 1983 and Mshelia et al., 2001).

Although not sexually active, bacteria were also isolated from the vagina of the kittens in this study, which might have occurred as a result of ascending infection from the perineum. The relative numbers of bacteria appeared to be more in the kittens than the adult cats in the present study. Clemetson and Ward, (1990) reported that reproductive cycle as well as age, have influence on vaginal bacterial count in cats.

All the cats sampled in the present study were apparently healthy. Species of bacteria recognized as pathogenic were present in the vagina of these cats. The mere presence of these bacteria in the vagina of the cats does not mean that an active infection exists. However, it is likely that these 'non-specific' bacteria can only cause disease in an unfavourable condition of stress (Hirsh, 1990). This further shows that there is no hard and fast rule with a clear cut that divide between the 'normal' bacterial flora and the pathogenic bacteria. The bacteria isolated in this study may not have any harmful effect on the reproductive life of the cats. However, to justify this statement further investigation needs to be performed using experimental transmission studies. The present study has demonstrated that aerobic bacteria reside in the

vagina of our indigenous domestic cats. Because the presence of these bacteria is not related to any vaginal infection, it may be concluded that commensal bacteria normally exist in the vagina of these cats and microbiological cultures from diseased queens must be interpreted in the light of the normal flora present in the reproductive tract.

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