

Original Research Article

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Diagnosis and Therapeutic Management of Canine Pyoderma in and around Kolkata, West Bengal, India

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ABSTRACT

Keywords

Bacteria, fungi, ecto-parasites, allergens, nutritional and hormonal imbalances

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Canine pyoderma is one of the most common causes of dermatitis with worldwide occurrence in small animal practice. The condition is diagnosed on the basis of clinical manifestations, isolation and identification of causative organisms by bacteriological cultural examination. A study on 150 clinical cases of Canine pyoderma was conducted at Belgachia Veterinary Clinics, under the Department of Veterinary Clinical Complex, Faculty of Veterinary and Animal Sciences, West Bengal University of Animal and Fishery Sciences, Kolkata during the period from May 2018 to April 2019. In the study undertaken, bacteriological culture examination of 30 pus swabs resulted for bacterial isolates. Exudates/pus samples were collected and subjected to bacteriological cultural isolation, identification and subsequently antibiotic sensitivity testing. Out of 30 isolates, 24 isolates were gram positive Cocci *i.e.* *Staphylococcus* sp. and 6 isolates were positive for gram positive *Staphylococcus* and *Streptococcus* mixed infection. Out of 24 *Staphylococcus* isolates, 24 were sensitive to CIS, 22 to CIT and AMS, 21 to NIT, 18 to AK, 13 to CIP, 12 to AX, 9 to CTR, 7 to CXM, 7 to CZX and 2 were sensitive to AMC. Out of 6 mixed infections of *Staphylococcus* sp. and *Streptococcus* sp., 4 were sensitive to NIT, CIS, AK and AMS, 3 to CZX, 2 were sensitive to AX, CTR, CXM, CIT, CIP, AMC, and AZM. Thirty numbers of positive pyoderma cases were treated with different drugs which are Enrofloxacin, Miconazole Nitrate, Chlorhexidine Gluconate, Cephalexin, 50% Ceramides, 25% Cholesterol. Treatment continued for a period of minimum three days post clinical recovery.

Introduction

In veterinary medicine very little information is available concerning the demographic pattern of skin diseases. Although an Egyptian veterinary papyrus from 2130 BC has mentioned the treatment of animal skin diseases (Neffgen, 1904), most

significant advances in the diagnosis and treatment of specific skin diseases occurred only during recent years.

Major etiological agents attributed to cause canine dermatoses are bacteria, fungi, ecto-parasites, and allergens, nutritional and hormonal imbalances.

Globally parasitic infestation are major problems in dog and diseases such as scabies and demodexosis constitute major health hazard for human being especially to children and serve as considerable reservoir of zoonotic diseases.

Bacterial infection (pyoderma) is another frequently encountered ailment among canine and also occurs as a result of underlying disorders such as hypersensitivity, ectoparasitic infestation and immunological disorders (Mason *et al.*, 1991).

Materials and Methods

One thousand four hundred twenty (1420) dogs were presented with dermatological problems at Belgachia Veterinary Clinics, under the Department of Veterinary Clinical Complex, Faculty of Veterinary and Animal Sciences, West Bengal University of Animal and Fishery Sciences, Kolkata during the period from May 2018 to April 2019. Of these, exudates/pus samples were collected from 30 dogs and were further subjected to bacteriological examinations that included cultural isolation on differential media.

The streaking of swabs collected from lesions was carried out and procured for cultural isolation and sensitivity test of the isolated organisms. From all the 30 samples, organisms were isolated and morphologically the isolates were gram positive Cocci. Primary identification of bacteria was done based on Gram's staining and colony morphology. Swabs taken from skin lesions for antimicrobial susceptibility test was performed on Mueller Hinton agar and Nutrient agar and examined for zone of inhibition as per the CLSI standards method described by Bauer *et al.*, 1966 (Table no: 1). In the present study, out of 150 canine dermatoses, 30 numbers of positive pyoderma cases were treated with different drugs which are mentioned in categorized groups *i.e.* group A, group B, group C and group D. Dogs of group A were treated with Bayrocin tablet + Dermichlor spray, the dogs of

group B were treated with Lixen palatab + Dermichlor spray, the dogs of group C were treated with Lixen palatab + DermSpot spot on and the dogs of group D were treated with Lizbid+ DermSpot spot on (Table no: 2).

Results and Discussion

The results of the present study were depicted in Fig 1, 2, 3, 4 and 5. By morphological study, out of 30 isolates 24 were *Staphylococcus* sp. and the rest 6 were mixed infection of *Staphylococcus* sp. and *Streptococcus* sp. Antibiotic sensitivity test was performed against all the isolates. Out of 24 Staphylococcal isolates 24 were sensitive to CIS, 22 to CIT and AMS, 21 to NIT, 18 to AK, 13 to CIP, 12 to AX, 9 to CTR, 7 to CXM, 7 to CZX and 2 were sensitive to AMC. Out of 6 mixed isolates of *Staphylococcus* sp. and *Streptococcus* sp., 4 were sensitive to NIT, CIS, AK and AMS. 3 to CZX, 2 were sensitive to AX, CTR, CXM, CIT, CIP, AMC, and AZM (Table no: 3).

Thirty positive pyoderma cases were divided into four groups *i.e.* group A, group B, group C and group D consisted of 15, 5, 5 and 5 number of dogs respectively. The dogs of group A were treated with tablet Bayrocin (Enrofloxacin) + Dermichlor spray (Miconazole Nitrate, Chlorhexidine Gluconate) and 14 (93.3%) had excellent responses (complete resolution of the infections) after treatment for 20 days, enrofloxacin was used and found effective in pyoderma cases. Similar observation had also been reported by Cerasela (2013). Five dogs of group B were treated with Lixen palatab (Cephalexin) + Dermichlor spray and (100%) recovered after treatment for 10 days, Cephalexin was used very successfully in pyoderma cases. Similar observation had also been reported by Cherni *et al.*, (2006). Combination of Chlorhexidine and Miconazole was used in present study which was found very effective. Kwochka (2005) opined the same when he used the same combination for the treatment of pyoderma cases.

Table.1 Showing each isolate tested for its sensitivity against the following antibiotic and antimicrobial agents

Sl. No.	Drug	Symbol	Concentration
1	Ampicillin/Cloxacillin	(AX)	10
2	Cefuroxime	(CXM)	30
3	Amikacin	(AK)	30
4	Ceftriaxone/Tazobactam	(CIT)	30/10
5	Ceftizoxime	(CZX)	30
6	Ceftriaxone/Sulbactam	(CIS)	30/15
7	Ciprofloxacin	(CIP)	5
8	Amoxicillin/ Sulbactam	(AMS)	30/15
9	Nitrofurantoin	(NIT)	300
10	Azithromycin	(AZM)	15
11	Amoxyclav	(AMC)	30
12	Ceftriaxone	(CTR)	30

Table.2 Showing drugs used for the treatment of pyoderma

Sl.No.	Generic name	Trade name	Dose rate and schedule	Route of administration	No of animal treated
1.	Enrofloxacin (Fluoroquinolone)	Bayrocin tablet (Bayer)	5-10 mg /kg b.wt. twice a day × 20 days	orally	15
2.	Cephalexin (Cephalosporins)	Lixen palatab (Virvac)	30 mg/kg b.wt. twice a day×10 days.	orally	10
3.	Linezolid (Oxazolidinone)	Lizbid tablet (Abbott)	10 mg/kg b.wt. twice a day×15 days.	orally	5
4.	Miconazole Nitrate, Chlorhexidine Gluconate, Propellant q.s.	Dermichlor spray. (Vetoquinol)	twice daily.	topically	20
5.	50% ceramides, 25% cholesterol and 10-20% long chain fatty acids.	DermSpot spot on (ttk)	2ml pipette- up to 10 kg b.wt. 4 ml pipette- 10kg b.wt. & above once in a week.	topically	10

Table.3 Showing the clinical cases of canine pyoderma with isolated bacteria and their antibiogram pattern

Sl. No.	Breed	Sex	Age	Organism isolated	In-vitro drug sensitivity results		
					Sensitive to	Intermediate Sensitive to	Resistance
I	II	III	IV	V	VI	VII	VIII
1.	Beagle	F	11 yrs.	<i>Staphylococcus</i> sp.	CTR,NIT,AM,CIP,CIS,CIT	CXM,AK,CZX	AMC,AZM,AX
2.	Mongrel	F	4 yrs.	<i>Staphylococcus</i> sp.	NIT,CIP,AMS,CIS, AK,CIT	CTR,CZX	AMC,AZM,AX,CXM
3.	G.S.D	F	1.2 months	<i>Staphylococcus</i> sp.	AZM,AMS,AK,CIS	NIT,CXM,CIT	AMC,CIP,CZX,AX,CTR
4.	Mongrel	F	9 months	<i>Staphylococcus</i> sp.	AMS,CIS,AX,AZM,NIT,CIT	CIP,CTR	CXM,AK,AMC,CZX
5.	Beagle	F	4yrs.	<i>Staphylococcus</i> sp.	AMS,CIT,	AK,AZM	NIT,CIP,AMC, CZX,CTR,CXM,AX,CIS
6.	Labrador	M	4yrs.	<i>Staphylococcus</i> sp.	CIT,CZX,AK, CXM,AMS, CIS,CTR	CIP,AMC	NIT,AZM,AX
7.	Beagle	M	9yrs.	<i>Staphylococcus</i> sp.	CIT,CIS,NIT,AMS,AZM,CIP	CTR,AK	AMC,AX,CXM,CZX
8.	Labrador	M	5yrs.	<i>Staphylococcus</i> sp.	AMS,CIT,CIS,AZM,CXM, CIP,CTR,NIT,AX,	AK	AMC,CZX
9.	Labrador	M	9yrs.	<i>Staphylococcus</i> sp.	NIT,CIS,CIT,AMS,AZM	AX,CIP	CTR,AK,CZX,AMC,CXM
10.	Labrador	M	1yr.	<i>Staphylococcus</i> sp.	NIT,CIT,CIS,AX,AZM,CIP,AMS		CXM,CTR,CZX,AMC,AK
11.	Mongrel	F	7yrs.	<i>Staphylococcus</i> sp.	AMS,CIS,NIT,AK,CIT,	CTR,AX	CXM,AMC,CIP,CZX,AZM
12.	Pug	F	8yrs.	<i>Staphylococcus</i> sp.	CIT,CIS,AMS		AX,CTR,CZX,CIP,AK,CX M, AMC,AZM,NIT
13.	Labrador	F	4yrs.	<i>Staphylococcus</i> sp.	CIS,CIT,CIP,NIT,AK,AMS	AZM	AMC,CXM,AX,CTR,CZX,
14.	Golden Retriever	F	9 months	<i>Staphylococcus</i> sp.	CIT,CZX,AX,AK,CIP,CXM,NIT, CIS,CTR,AMS,		AZM,AMC,
15.	Spitz	F	3 yrs.	<i>Staphylococcus</i> sp	CIP,AX,AMS,CIS,CIT	AK,AZM	NIT,CZX,CTR,CXM,AMC
16.	Pug	M	1.5 yrs.	<i>Staphylococcus</i> sp.	NIT,AK,AX,CIS,CIP,AMS,CTR	CIT,AZM	CZX,AMC,CXM
17.	Spitz	F	1yr.	<i>Staphylococcus</i> sp.	NIT,AX,CIT,CXM,CZX	CIP,AK,	CTR,CIS,AMS,AZM,AMC
18.	Labrador	F	2.5 yrs.	<i>Staphylococcus</i> sp.	CIP,AK,AMS,NIT,AX,CTR	AMC	AZM,CIT,CIS,CXM,CZX
19.	G.S.D	F	11 months	<i>Staphylococcus</i> sp.	AMC,NIT,CIS,CIT,AK	CZX,CXM,CIP, AX	AMS,CTR,AZM

20.	Mongrel	M	2 yrs.	<i>Staphylococcus</i> sp.	CIS,CIT,AX,AK,CTR	CIP,AZM	AMC,AMS,NIT CXM,CZX
21.	Cocker	F	8 months	<i>Staphylococcus</i> sp.	CIT,CIS,AK, NIT	CIP	AX,CTR,CXM, CZX,AMC,AMS,AZM
22.	Labrador	M	6 yrs.	<i>Staphylococcus</i> sp.	AZM,AMS,AK,CIS	AMC,CIP,CZX, AX,CTR	NIT,CXM,CIT
23.	Spitz	F	2.5 yrs	<i>Staphylococcus</i> sp.	CIT,CZX,AX,AK,CIP,CXM,NIT	CIS,CTR,AMS,	AZM,AMC,
24.	Lassa	M	6 months	<i>Staphylococcus</i> sp.	CIS,NIT,AK,CIT, AZM	AMS, CTR	CXM,AMC,CIP,CZX,AX
25.	Pug	F	2.3 months	<i>Streptococcus</i> sp.	CIS,CIT,AX,AK,CTR, CIP,AZM		AMC,AMS,NITCXM,CZX
26.	Boxer	F	4 yrs.	<i>Streptococcus</i> sp.	CZX,CXM,CIP,AX, AMS	CTR,AZM,AK	AMC,NIT,CIS,CIT
27.	Labrador	M	4 yrs.	<i>Streptococcus</i> sp.	CZX,AMC,CIT,CIS,AK, NIT	CIP	AX,CTR,CXM,AMS,AZM
28.	Spitz	F	1yr.	<i>Streptococcus</i> sp.	AMS,CTR,CIS,NIT,AK,	CIT, AZM,AX	CXM,AMC, CIP,CZX
29.	Beagle	M	1.5 months.	<i>Streptococcus</i> sp.	AMC,AMS, NIT,CXM,CZX	CIS,CIT,AX	AK,CTR,CIP,AZM
30.	Mongrel	F	7 yrs.	<i>Streptococcus</i> sp.	AZM,AMS,AK,CIS,NIT	AMC,CIP,CZX, AX,CTR	CXM,CIT

Fig.1 Showing pyoderma lesion before treatment



Fig.2 Showing pyoderma lesion after treatment



Fig.3 Showing gram positive cocci, *Staphylococcus* sp. on Gram's stain

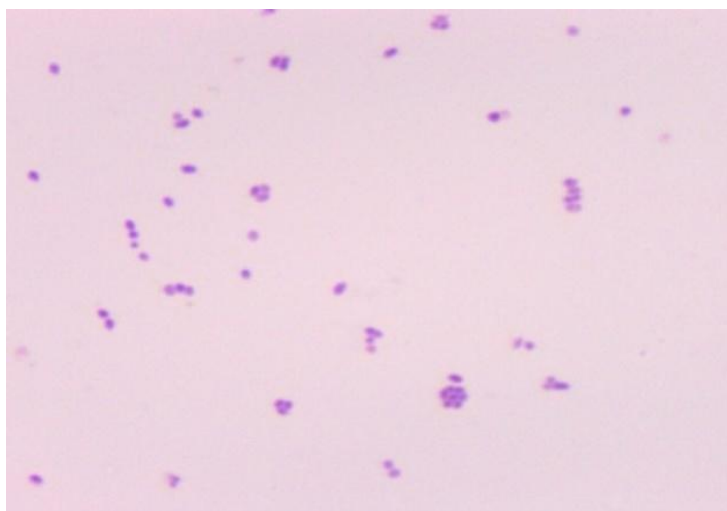


Fig.4 Showing gram positive cocci both *Staphylococcus* sp. and *Streptococcus* sp. on Gram's stain

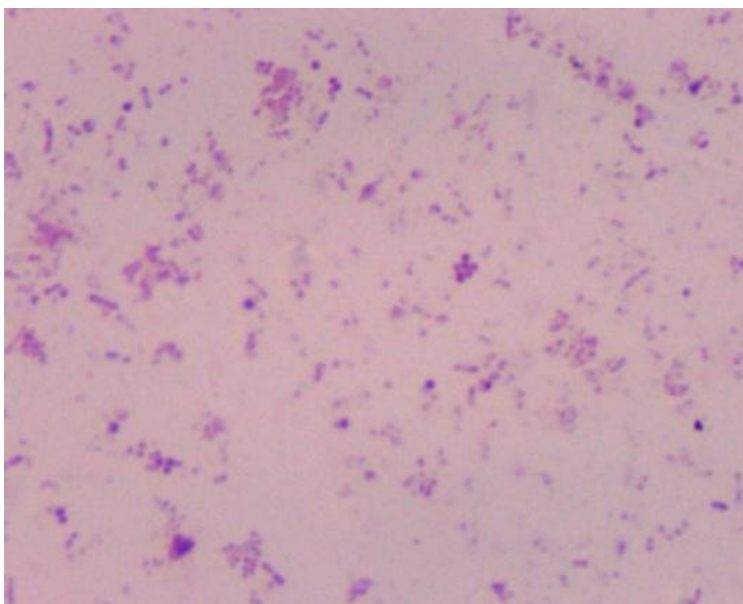


Fig.5 Showing zone of inhibition



Five dogs of group C were treated with Lixen palatab + DermSpot spot on (50% Ceramides, 25% Cholesterol) 3 (60%) dogs recovered after treatment for 10 days, and the 5 dogs of group D were treated with tablet Lizbid (Linezolid) + DermSpot spot on 4 (80%) dogs recovered after treatment for 15 days without any side effects. Dash *et al.*, (2017) reported that linezolid was highly effective to gram positive bacteria in comparison to cefexime and cefpodoxime. Ceramide-containing emulsion

(ceramide, cholesterol and fatty acid) was used by Popa *et al.*, (2012) with successful result.

References

Bauer, A. W., Kirby, W. M. M., Sherris, J. C. and Turck, M. (1966). Antibiotic Susceptibility Testing by a Standardized Single Disk Method. *American Journal of Clinical Pathology*, 45: 493.

- Cerasela, V. (2013). Bacterial pyoderma in dogs. *Bulletin UASVM, Veterinary Medicine*, 70 (2): 321-328.
- Cherni, J. A., Boucher, J. F., Skogerboe, T. L., Tarnacki, S., Gajewski, K. D. and Lindeman, C. J. (2006). Composition of the efficacy of cefpodoxime proxetil and cephalexin in treating bacterial pyoderma in dogs. *International Journal of Applied Research in Veterinary Medicine*, 4 (2): 113-118.
- Dash, S., Jyotiranjana, T., Das, L. P., Sahoo, R., Mohapatra, S. and Das, Manoranjan. (2017). Management of demodicosis (*Demodex canis*) associated with secondary bacterial infections in Dog. *The Pharma Innovation Journal*, 6 (9): 372-375.
- Kwochka, K.W. (2005). *In vitro* placebo-controlled time-kill comparison of an aqueous rinse formulation containing miconazole nitrate and chlorhexidine gluconate against bacterial and fungal cutaneous pathogens. *Veterinary Dermatology*, 16: 200-201.
- Mason, L. S. (1991). Canine pyoderma. *Journal of Small Animal Practice*, 32: 381-386.
- Neffgen, H. (1904). *Der Veterinar Papyrus von Kahun*. S. Calvary and Co, Berlin (Cited by Muller and Kirk, 1976).
- Popa, I., Remoue, N., Osta, B., Pin, D., Gatto, H., Haftek, M. and Portoukalian, J. (2012). The lipid alterations in the stratum corneum of dogs with atopic dermatitis are alleviated by topical application of a spingolipid-containing emulsion. *Clinical and Experimental Dermatology*, 37: 665-671.

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