ISOLATION OF BACTERIA FROM CLINICAL MASTITIS AND THEIR ANTIBIOGRAM PATTERN

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Received: 29-04-2014, Accepted: 31-05-2014

ABSTRACT

Milk samples from the 18 clinical cases of mastitis, were subjected to cultural isolation and antibiogram studies. The predominant bacterial isolates recovered from clinical cases of mastitis were *Staphylococcus sp.* followed by *Escherichia coli*, *Streptococcus sp.* and *Klebsiella sp*. Antibiogram pattern of these isolates revealed that most of the isolates were sensitive to enrofloxacin and ceftriaxone followed by gentamicin, erythromycin and lincomycin. Most of the isolates were resistant to tetracycline.

Key words: Clinical Mastitis, Bacteria, Antibiogram

INTRODUCTION

Mastitis is one of the most costly diseases of lactating animals. Mastitis is caused by many bacteria, which include the coliform group (specifically *Escherichia coli*, *Enterobacter* sp and *Klebsiella* sp), *Streptococci, Staphylococci, Corynebacteria, Pasteurella, Mycoplasma, Leptospira, Yersinia, Mycobaceteria, Pseudomonas, Serratia,* and other organisms like fungi, yeasts and virus (Kotowshi, 1988). The gram positive bacteria are the main cause of mastitis, *Staphylococcus aureus* being, the causal agent of the most frequent clinical and sub clinical mastitis, (Cruz-Carillo *et al.,* 2007). Drug resistance is a major problem in veterinary medicine practice. Resistance in some cases has been attributed to genome of the bacteria also. However as the sensitivity or resistance pattern varies from one study to other, from one geographical area to other, it is essential to study the organisms involved in cases of mastitis and their antibiotic sensitivity pattern from time to time to effectively treat the cases of mastitis.

MATERIALS AND METHODS

Milk samples were collected from 18 cows with acute mastitis presented to Veterinary College Hospital, Bangalore, Veterinary College dairy farm, Bangalore and Teaching Veterinary Clinical Service Complex, Yehalanka, Bangalore from August 2008 to January 2009 and were subjected to cultural isolation and antimicrobial sensitivity test using disc diffusion method as per Cruickshank *et al*. (1975) on Muller Hinton agar plate. The antibiotic discs used in the present study were enrofloxacin, gentamicin, tetracycline, ceftriaxone, lincomycin and erythromycin.

RESULTS AND DISCUSSION

1. Isolation and identification

The frequency of isolation of different bacterial isolates from clinical mastitis cases is depicted in Table 1. The present study could yield 20 isolates, out of this 70 per cent of the isolates were Gram-positive and remaining 30

per cent detects were Gram-negative. This indicated that Gram-positive organisms were the main causative agents of mastitis in cows. Similar observations were made by Cruz-Carillo *et al.* (2007). But Jones and Ward (1990) reported that gram negative organisms were predominant organisms causing mastitis.

The predominant bacterial isolates recovered were *Staphylococcus sp.* (45 %), followed by *Escherichia coli* (25 %), *Streptococcus sp.* (25 %) and *Klebsiella sp.* (5%). In the present study *Staphylococcus sp. was the major pathogen causing mastitis in cattle and similar observations were made by* Sumathi (2005) and Rajeev (2006). In contrast, Varma *et al.* (2000) reported high prevalence of *E. coli*, followed by *Staphylococcus* sp. Rao *et al.* (1989) reported high prevalence of *Streptococcus agalactiae* followed by *Staphylococcus aureus*. Rahman *et al., (*1984) reported high prevalence of *Staphylococcus aureus* followed by *Streptococcus.* Wani and Bhat (2003) reported high prevalence of *Staphylococcus aureus* followed by *Klebsiella sp.* This variation may be due to changing scenario of pathogen from time to time, from herd to herd and from one geographical area to other.

2. Antibiogram of isolated organisms

The antibiogram patterns of different bacterial isolates were depicted in Table 2. Most of the *Staphylococcus sp.* isolates were sensitive to enrofloxacin (88.89%), erythromycin (88.89%), lincomycin (88.89%); followed by ceftriaxone (66.67%), gentamicin (55.56%) and tetracycline (33.34%). Similar observations were made by Owens *et al.* (1997), who reported high sensitivity to enrofloxacin (95 %) followed by erythromycin (90 %). In contrast, they also reported highest sensitivity to tetracycline (100 %), whereas in our study 67 % of *Staphylococcus* sp. found to be resistant to tetracycline.

Table 1. The frequency of isolation of different bacterial agents from clinical mastitis cases

Bacterial Isolate	n=20	Percent Sensitivity
Staphylococcus sp	9	45
Streptococcus sp	5	25
E coli	5	25
Klebsiella	1	5

Table 2. The antibiogram pattern of different bacterial isolates

Isolates	Staphylococcus sp	Streptococcus sp	E coli	Klebsiella sp
Antibiotic disc	Percent Sensitivity			
Enrofloxacin	88.89	100	80	20
Gentamicin	55.56	40	80	20
Tetracycline	33.34	60	60	-
Ceftriaxone	66.67	60	80	20
Lincomycin	88.89	20	60	-
Erythromycin	88.89	20	60	-

The *Streptococcus.* sp were found to be highly sensitive to enrofloxacin (100 %); followed by tetracycline (60%), ceftriaxone (60%), gentamicin (40%), lincomycin (20%) and erythromycin (20%). These findings are in accordance with Rameshkumar and Anshusharma (2002) who had reported highest sensitivity to enrofloxacin (100 %). In contrast Owens *et al.* (1997) reported highest sensitivity to erythromycin (92 %). These variations could be due to change in sensitivity pattern from place to place, herd to herd and time to time.

E. coli, isolates were sensitive to enrofloxacin (80 %), gentamicin (80%), ceftriaxone (80%) followed by tetracycline (60%), lincomycin (60%) and erythromycin (60%). The similar observation was made by Prabhakar *et al.* (1988) and Vijayalakshmi and

Prathaban (2007) with minor changes in sensitivity pattern.

The *Klebsiella sp isolates* showed least sensitivity to enrofloxacin (20%), gentamicin (20%), ceftriaxone (20%). Complete resistance was observed to tetracycline, lincomycin and erythromycin.

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