IOSR Journal of Agriculture and Veterinary Science (IOSR-JAVS)
e-ISSN: 2319-2380, p-ISSN: 2319-2372. Volume 9, Issue 6 Ver. I (Jun. 2016), PP 33-35
www.iosrjournals.org

Bacteriological and Antibiogram Studies Of Milk Samples Of Clinical Mastitis In Goats.

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Abstract: *The objectives of the study was to isolate the major bacteria responsible for clinical mastitis and their antibiogram in goats in and around Hyderabad. Total of 18 milk samples were collected and of which 26 bacterial pathogens were isolated viz., 12/18 Staphylococcus spp. (66.66%) (8/18 coagulase positive Staphylococcus spp. (44.44%), 4/18 coagulase negative Staphylococcus spp. (22.22%) were predominant followed by 9/18 Escherichia coli (50%), 3/18 Klebsiella spp. (16.67%) and 2/18 Streptococcus spp. (11.11%). The whole milk cultures from 18 affected quarters showed 94.44 per cent sensitivity to ceftriaxone followed by amoxicillin + clavulanic acid (88.88%), gentamicin (61.11%), enrofloxacin (55.55%), ampicillin (44.44%) and doxycycline (33.33%). However, all (100%) whole milk cultures were resistant to penicillin G.*

Keywords: *mastitis, antibiogram, coagulase, ceftriaxone, amoxicillin.*

I. Introduction

Mastitis in goats is a universal disease associated with inflammation of the mammary gland and is characterized by changes in the physical characteristics of the udder or milk (Nazifi *et al.*, 2011). Intramammary infection of dairy goats are mainly of bacterial origin (Marin *et al.,* 2007) of which *Staphylococcus* is a major pathogen (Contreras *et al.,* 2007). Coliforms are probably among the major etiological organism of clinical mastitis (Shathele, 2009).

II. Materials And Methods

The present investigation was carried out among the twelve mastitic goats that were presented to the Campus Veterinary Hospital and Veterinary Ambulatory Clinic of TVCC, College of Veterinary Science, Rajendranagar, Hyderabad for a period of twelve months *i.e.,* from June, 2013 to May, 2014 with the history and signs of enlargement of udder and abnormal milk (quality and quantity). Clinical mastitis was assessed based on palpation of udder for severity of inflammation and milk secretions for gross abnormalities.

Milk samples were collected aseptically from the affected quarters for cultural isolation and antibiogram. The antibiotic sensitivity of the whole milk sample cultures was done in vitro by disc diffusion method on brain heart infusion (BHI) agar plates for the antibiotics discs ceftriaxone (CTR, 30µg), amoxyclav (AMC, 30µg), gentamicin (G, 10 µg), enrofloxacin (Ex, 5 µg), ampicillin (AMP, 10 µg), doxycycline (DO, 10 µg) and penicillin G (10units).

III. Results And Discussion

The bacterial pathogens isolated from eighteen quarters of clinical mastitis in the present study were 12/18 *Staphylococcus* spp. (66.67%) (8/18 coagulase positive *Staphylococcus* spp. (44.44%), 4/18 coagulase negative *Staphylococcus* spp. (22.22%), 9/18 *Escherichia coli* (50%), 3/18 *Klebsiella* spp. (16.67%) and 2/18 *Streptococcus* spp. (11.11%). The present results are in close association with the findings of Sharma *et al.* (1999) who reported that *Staphylococcus* (coagulase positive *Staphylococcus* spp. (44.76%) and coagulase negative *Staphylococcus* spp. (22.86%)) was the predominant organism isolated from mastitis milk samples followed by *Streptococcus* spp., *E.coli, Bacillus* spp., *Cornyebacterium* spp. and *Pseudomonas* spp. whereas, Ajuwape *et al.* (2005) isolated coagulase-negative *Staphylococcus* (50.9%) as predominant organism followed by *Escherichia coli* (15.1%), *Streptococcus* spp. (9.4%), *Bacillus cereus* (7.5%), *Mannhiemia haemolytica* (5.7%), *Corynebacterium* spp. (5.7%) and *Klebsiella pneumoniae* (5.7%). Pal *et al.* (2011) isolated *E.coli* alone and mixed infection with *Staphylococcus aureus* and *E.coli* from per-acute and acute gangrenous mastitis in goats. Islam *et al.* (2011) isolated *Staphylococcus aureus* (36.36%) as major pathogen followed by coagulase negative *Staphylococcus* spp. (27.27%), *Eschericia coli* (18.18%), *Streptococcus* spp. (9.09%) and unidentified gram negative bacteria (9.09%) from clinical mastitis in goats.

The another major isolate in our study was *E.coli* (50%). Higher prevalence of *E.coli* (30%) was reported by Ameh and Tari (2000). The higher prevalence of coliforms might be due to the unclean environment in which the goats are maintained. Quite a large number of bacterial agents are present in environment, surrounding the sheds, beddings, contaminating the fodder and water where the animals are kept. Animals

contract the infection of udder from unhealthy surroundings. The environmental pathogens most commonly found are the *Streptococcus uberis, Streptococcus dysgalactiae, Streptococcus equinus, Streptococcus bovis, E.coli, Klebsiella* spp, *Citrobacter* spp, *Enterobacter* spp, *Pseudomonas* spp, *Serratia* spp, *Proteus* spp. (Radostitis *et al.,* 2000).

Analysis of the isolation pattern during the present study revealed that the predominant organism was *Staphylococcus* spp. followed by *Escherichia coli, Klebsiella* spp. and *Streptococcus* spp. Mono microbial infection was noticed in 55.55% (10/18) of the quarters of which *Staphylococcus* spp. was noticed in a total of 5/18 (27.77%) (coagulase positive *Staphylococcus* spp. in 4/18 (22.22%) and coagulase negative *Staphylococcus* spp. in 1/18 (5.55%) quarters and *E.coli* in 5/18 (27.77%) quarters as single entity. Whereas, mixed infection with coagulase positive *Staphylococcus* spp. and *E.coli* was noticed in 1/18 (5.55%), coagulase negative *Staphylococcus* spp. and *E.coli* was noticed in 2/18 (11.11%), coagulase positive *Staphylococcus* plus *Klebsiella* in 2/18 (11.11%) quarters, coagulase negative *Staphylococcus* plus *Klebsiella* in 1/18 (5.55%), coagulase positive *Staphylococcus* plus *Streptococcus* in 1/18 (5.55%) quarters and *Streptococcus* plus *E.coli* in 1/18 (5.55%) quarters. Single etiological agents were isolated from 55.56 per cent of the quarters whereas mixed infection was detected in 44.44 percent of the quarters. Sarker and Samad (2011) reported mono microbial infection in 76.27% of the infected quarters and mixed infection in 16.95% of the quarters. The fact that the variation in the isolation of organisms causing mastitis may be a result of differences existing in the agro-climatic zones favouring the endemicity of a particular bacterial agent in a particular area supported by the local husbandry practices and the kind of mastitis treatment practices prevailing in that particular area. The etiological agents that cause mastitis vary widely within the population depending on the managemental practices and geographical area. In the present study, out of 18 quarter milk samples, nine were *E.coli* and three were *Klebsiella* isolates which were found to be the environmental pathogens. Out of nine *E.coli*, six were found in goats which were during their early stage of lactation. Similarly, two out of three *Klebsiella* isolates were found in goats during their early stage of lactation. Most new infections occur during the early part of the dry period and in the first two months of lactation, especially with the environmental pathogens (Radostitis *et al.*, 2000).

The antibiogram of 18 whole milk cultures revealed 94.44 per cent sensitivity to ceftriaxone followed by amoxicillin + clavulanic acid (88.88%), gentamicin (61.11%), enrofloxacin (55.55%), ampicillin (44.44%) and doxycycline (33.33%). All (100%) whole milk cultures were resistant to penicillin G. The sensitivity pattern recorded in the present study is in close accordance with those of Pal *et al*. (2011) who recorded that isolates were sensitive to amoxicillin, cloxacilin, gentamicin and cholortetracycline but resistant to penicillin and streptomycin. Sreeja *et al.* (2013) recorded that the *Staphylococcus* isolates were 97% sensitive to ceftrioxone. The difference in sensitivity patterns of microbes to various antimicrobials observed could be ascribed to ecological reasons, seasonal variations, unidentical microbial pattern, multiple drug resistance and area specificity.

The higher sensitivity to amoxicillin + clavulanic acid and ceftriaxone in the present study could be due to very rare use of these antibiotics in the treatment of mastitis. The resistance pattern of all isolates to penicillin G may be attributed to the extensive and often injudicious use of penicillins in treating mastitis (Ghose and Sharda, 2003).

IV. Conclusion

In the present study total of 26 bacteria were isolated from 18 milk samples that were collected aseptically from the affected quarters of which 12/18 *Staphylococcus* spp. (66.66%) (8/18 coagulase positive *Staphylococcus* spp. (44.44%), 4/18 coagulase negative *Staphylococcus* spp. (22.22%) were predominant followed by 9/18 *Escherichia coli* (50%), 3/18 *Klebsiella* spp. (16.67%) and 2/18 *Streptococcus* spp. (11.11%) and the isolates showed highest sensitivity of 94.44 per cent to ceftriaxone followed by amoxicillin + clavulanic acid (88.88).

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