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Research Article

Diagnostic Study of She Camel Subclinical Mastitis in Al-Hyadia District – Al-Najaf Province

Hayder M. Al-Rammahi*, Abdulameer Abed Hatem, Asaad Chasib Al-Atabi

College of Veterinary Medicine/ University of Kufa, Kufa /Iraq.

Abstract | This study was carried out at Al-Hyadia arid area/Al-Najaf on 82 she camels. Based on bacterial isolation, the subclinical mastitis was detected in 24 out of 82 she camels at percentage rate of 19.68%. The highest percentage of isolates was17.68 and 12.92 for Coagulase –ve *Staphylococci* followed by *Streptococcus spp*., respectively. The percentages rate of *Staphylococcus aureus*, E. *coli* and *Micrococcus spp* were 10.2%, 8.16% and 4.08%, respectively. Based on bacterial isolation as confirmed diagnosis of subclinical mastitis, the milk samples with Coagulase –ve *Staphylococci*, *E. coli* and *Staphylococcusaureus* revealed score 3 to California mastitis test (CMT) reaction with pH ranged 7.5-6.73 and electric conductivity 8.1-7.9 ms/cm, while in *Streptococcus spp*. and *Micrococcus* revealed score 2 to CMT reaction with pH ranged 6.89-6.44 and electric conductivity 7.81-7.68 ms/cm. In conclusion, the results of the present study approved investigation of subclinical mastitis in she camel and its causative agents. Moreover, CMTcan be approved as fast and effective, but less sensitive in diagnosis of subclinical mastitis.

Keywords | CMT, *Camelus dromedaries*, Iraq subclinical mastitis

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***Correspondence** | Hayder M. Al-Rammahi, College of Veterinary Medicine/ University of Kufa, Kufa /Iraq; **Email**: hayderm.alrammahi@uokufa.edu.iq
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INTRODUCTION

There are a great demand for the milk and dairy products in the past decades, however the needs has been increased because the huge demand due to growing of populations worldwide (Tiwari et al., 2013). Camel breeding plays an important role in the life of the desert inhabitants. Camel milk is an important source of protein and energy and some vitamins such as vitamin C, which is difficult for the Bedouin to get them from other sources (Saleh and Faye, 2011). Mastitis is the main problem facing milk production in dairy animals. Moreover it has zoonotic and economic importance (Tibary and Anouassi, 2000).The cornerstone in the prevention of mastitis in milk animals is the early treatment of sub-clinical mastitis, which depends mainly on the diagnosis of this disease as soon as possible through early detection methods (Abdulrahman,1995). Many methods have been advised for rapid diagnosis of subclinical mastitis in dairy animals which based mainly on inflammation products such as California mastitis test (CMT), somatic cell count (SCC), pH estimation and electrical conductivity (Salah and Faye, 2011; Viguier et al., 2009; Younan et al., 2001). The present study conducted to assess subclinical mastitis in Arabian camels in Al-Najaf province.

MATERIALS AND METHODS

Study Area and Animals

The study was carried out at Al- Hyadia arid district which was located 38 km western to Al-Najaf were 82 she camels (at variousl actation stages). Clinical examination was done for all animals with particular attention to udders.

Milk Sampling

After stimulation of milking by camel calf, each udder quarter was washed and disinfected with 70% ethanol. The first few drops were discarded and 10 ml of milk placed in aseptic plain tube. All samples were kept in icebox (4C°) and transported immediately to laboratory for examination.

Bacteriological Examination

Bacteriological examinations were carried out following standard methods according to methods described by Quinn et al. (1994). Briefly, a loop-full of milk was streaked on 5% sheep blood agar, and incubated aerobically at 37 ^{0}C for 24-48 hours. Identification of bacterial isolates was based on colonies morphology, Gram's stain reaction, and haemolytic characteristics on blood agar and catalase test. *Staphylococci* and *Micrococci* were identified by growth on manitol salt agar, coagulase production, catalase and oxidase tests. Gram's stain negative isolates were sub-cultured on MacConcky agar and further tested using triple sugar Iron TSI agar, Indol, methyl red,Voges-Proskauer, citrate utilization test, urea and oxidase reaction.

California Mastitis Test (CMT)

CMT was carried out according to method mentioned by Jilo et al. (2017), briefly by adding equal parts (5 ML) of milk and CMT reagent in each paddle wells according to arrangement of quarters with slight rotation movement of paddle. The reactions were interpreted according to gel formation as score 0:no gel formation; score 1 slight (slim) gel formation,which disappeared with movement;score 2 distinctive slim formation; score 3 gel formation as mass to bottom of paddle.

Somatic Cell Count (SCC)

The direct microscopic somatic cell counting method was carried out by spreading of 1 µL of thoroughly mixed milk from each samples over 1 cm^2 area on a glass slides, air drying and were stained by Newman-Lampert stain as described by Ali et al. (2016).

Electric Conductivity and PH

Each milk samples was examined by milk electrical conductivity meter (Dramaniski) after calibration of device with standard buffer solutions. Milk Ph was measured by pH-meter.

RESULTS

According to bacterial isolation, the subclinical mastitis was detected in 24 out of 82 She camels in percentage rate 19.68%. The Coagulase –ve *Staphylococci* revealed the highest percentage 17.68% of isolates followed by *Streptococcus spp*. (12.92%), while the percentage rate of *Staphylococcus aureus*, *E. coli* and Micrococcus were 10.2%, 8.16% and 4.08% respectively (Table 1).

Subclinical mastitis was diagnosed based to bacterial isolation from the milk samples accompanied with California mastitis test and the relation was made between the isolated bacteria and CMT score. score 3 CMT score 3 was seen with Coagulase –ve *staphylococci*, *E. coli* and *Staphylococcus aureus* with PH ranged 7.5-6.73 and electric conductivity 8.1-7.9 ms/cm. While CMT score 2 was observed with *Streptococcus spp*. and *Micrococcus* isolates with PH ranged 6.89-6.44 and electric conductivity 7.81-7.68 ms/cm (Table 2).

Table 1: Reveals percentages of the isolates

Isolate	No. isolates	%
Coagulase –ve Staphyloocci	26	17.68
Streptococcus spp.	19	12.92
Staphylococcus aureus	15	10.2
E. coli	12	8.16
Micrococcusspp.	6	4.08

Table 2: Reveals the relationship between isolates, SCC, CMT, pH and electric conductivity

Isolates	SCC 10^3	CMT	PH	Electric conductivity ms/cm
Coagulase –ve Staphyloocci	300	3	7.5	8.1
E. coli	260	3	7.43	7.93
Staphylococcus aureus	180	3	6.73	7.9
Streptococcus spp.	120	2	6.89	7.81
Micrococcus	110	2	6.44	7.68
No isolate	36	0	6.31	6.13

DISCUSSION

The results of bacteriological isolations revealed that Coagulase –ve *staphylococci* and *Streptococcus spp* were the main causative agents with percentages of 17.68% and 12.92 %, respectively. These results are in agreements with previous reported studies (Al Salihi et al., 2017; Al-Juboori et al., 2013). Other researchers also recorded that these organisms are major mastitis causative agents in she-camels (Yagoob and Sanaa, 2005). The entrance of infection is the teat canal, through teat the infection reaches the mammary gland. There are two sources of infective agent- the udder- where many bacteria like *Streptococcus agalactia* and *Staphylococcus aureus* may be present as normal inhabitant and the environment- where causative agents like *E.coli* persist as recorded by Seifu and Tafesse, (2010).

The skin surface of the camel has many microorganisms as inhabitant population and from where the organisms may have the chance to invade through contamination by the handlers. Spread of infection is possible through bedding ground by discharges of affected gland; these results are agreement with Abdurahman, (1995). In conclusion, this study found that bacteriological isolation were accurate method to determine the causative agents of mastitis. In

addition, the measurement of EC is an inexpensive, simple and rapid method when compared to SCC. Moreover, this study found that the electrical conductivity (EC) test can be done on site and California mastitis test (CMT) was fast, cost effective but with low sensitivity.

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CONLICT OF INTEREST

There is no conflict of interest regarding the publication of this manuscript for any other authorities

AUTHORS CONTRIBUTION

All authors contributed equally.

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