بسم الله الرحمن الرحيم

MONA MAGHRABY

شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم

MONA MAGHRABY

شبكة المعلومات الجامعية

التوثيق الإلكتروني والميكروفيلم

جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها
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Some bacteriological and immunological studies on subclinical mastitis in cows

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Microbiology
Bacteriology – Immunology – Mycology

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Abstract

Subclinical mastitis has been considered the most important problem in dairy farms all over the world. Decrease of milk yield is the major fraction of financial losses in addition to other causes. Adoption of subclinical mastitis (SCM) control programs are seen in many countries. The current diagnosis of SCM depends on the detection of inflammatory reaction and microbial culturing. Somatic cell count (SCC) is now the screening tool for the inflammatory reaction and as there are many other effectors that may alter SCC, another screening tool is required to be used instead of SCC or together with it.

The study was applied on 528 bovine quarters' milk samples of 137 Holstein Friesian cows belonged to two groups of herds. 338 quarter milk samples of 85 cows from large, organized and intensive farm herds (group A) and 190 samples of 52 cows from small, medium non-organized farms and small holders' herds (group B).

On relative to total examined quarters, SCM quarters and recovered isolates, ***S. dysgalactiae*** was the most isolated pathogen and constituted 13.66 %, 32 % and 26.85 % followed by ***S. epidermidis*** (7.77%, 18.2% and 5.29%) then ***S. saprophyticus*** (7.56%, 17.7% and14.87%), ***E. coli*** (7.35%, 17.2% and 14.46%), ***S. uberis*** (5.25%, 12.3% and 10.33%), ***S. aureus*** (3.6%, 8.37% and 7.02%), ***S. agalactiae*** (2.31%, 4.41% and 4.56%) and ***Proteus vulgaris*** (2.1%, 2.9% and 4.13%) respectively. At last, each **of *B. cereus, M. luteus and P. aeruginosa*** constituted 0.42%, 0.98% and 0.83% respectively.

In group A, the most isolated was ***S. dysgalactiae*** (25.8%) followed by ***S. epidermidis*** (16.1%), ***S. saprophyticus*** (14.8%), ***E. coli*** (12.9%)***, S. uberis*** (1.96%)***, S. aureus*** (10.3%)***,*** and ***S. agalactiae*** (3.2%).

In group B, the most obtained isolates were ***S. dysgalactiae*** (28.7%) followed by ***E. coli*** (17.2%) then ***S. saprophyticus*** (14.9%), ***S. epidermidis*** (13.8%), ***S. uberis*** (9.2%), ***Proteus vulgaris*** (6.9%) and ***S. agalactiae*** (6.9%).

Geometric mean of the SCC in group (A) was higher than that of the group (B) which were 548000 and 455000 cell/mL respectively.

Geometric mean of lactate dehydrogenase (LDH), Glutamic oxaloacetic transaminase (GOT) and alkaline phosphatase (ALP) were 378, 147 and 469 IU/L respectively. Higher LDH, GOT and ALP mean in case of SCM in the organized farm group (419, 158 and 488 IU/L respectively) in relative to non-organized farms group (359, 150 and 446 IU/L respectively).

PCR amplification and gene detection were conducted on the extracted DNA of the isolated pathogens. Detection of the amplified products of ***E. coli*** (231bp), ***S. agalactiae*** (280 bp), ***S. aureus*** (108 bp), ***S. epidermidis*** (124 bp), ***S. dysgalactiae*** (270 bp) and ***S. uberis*** (330 bp) revealed a confirmation of 100%, 72%, 40%,73%, 75% and 100% of isolates respectively.

More strong significant positive correlation of ALP (r (203) = 0.50, P = 0.001) with SCC in screening samples in comparison with LDH (r (203) = 0.174, P = 0.01.) and GOT (r (203) = 0.317, P = 0.001).

Dedication

I dedicate this thesis to:

To my late Brother

To my late Wife

To my Mother and Father

To my Daughters

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I am greatly indebted to gracious Allah for helping me to carry out this work.

I would like to express my sincere gratitude and deep appreciation to The ***late Prof. Dr. Mohamed Kamal Mahmoud Refai****, Professor of Microbiology, Faculty of Veterinary Medicine, Cairo University.*

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I pray to God to mercy them, and let their dormitories in spacious paradises. I pray to God to descend them in dwellings of messengers and martyrs of Allah's in gardens of bliss. I pray to God to benefit many with their knowledge and reward them with their good deeds in the gardens of bliss, Amen.

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ALP	Alkaline phosphatase
ALT	Alanine aminotransferase
APP	Acute phase protein
AST	Aspartate transaminase (AST) or aspartate aminotransferase, also known as AspAT/ASAT/AAT or (serum) glutamic oxaloacetic transaminase (GOT, SGOT)
BMEC	Bovine mammary epithelial cells
BMSC	Bulk milk somatic cell count
CFU	Colony forming unit,
CM	Clinical mastitis
CMT	California mastitis test
CNS	Coagulase-negative Staphylococcus spp.
CPS	Coagulase-positive Staphylococcus spp.
DI-IIA	The Dairy Herd Improvement Association
DNA	Deoxyribonucleic acid
E. coli	***Escherichia coli***
EMB	Eosine methylene blue agar medium
GBS	Group B Streptococcus
GOT	Glutamic oxaloacetic transaminase
Hb	haptoglobin
ID	Identification
IMI	Intramammary infection.
IMVIC test	Indole, Methyl red, Vogas Proskauer and Citrate tests
IP	Interpretation
LDH	Lactate dehydrogenase
LW-N L-X	Levowitz-Weber / Newman-Lampert xylene stain
MAA	Milk amyloid A
MIC	Minimum inhibitory concentration
MLST	Multilocus sequence typing
mPCR	Multiplex polymerase chain reaction
NAGase	N-Acetyl-Beta-D-glucosaminidase
NAGase	N-acetyl glucosaminidase
NAS	Non-aureus Staphylococcus spp.
PFGE	Pulsed field gel electrophoresis
PMA	Propidium monoazide
PMNs	Polymorphonuclear cells
RFLP	Restriction fragment length polymorphism
S. agalactiae	***Streptococcus agalactiae***
S. aureus	***Staphylococcus aureus***
S. dysgalactiae	***Streptococcus dysgalactiae***
S. epidermidis	***Staphylococcus epidermidis***
S. saprophyticus	***Staphylococcus saprophyticus***
S. uberis	***Streptococcus uberis***
SCC	Somatic cell count
SCM	Subclinical mastitis
SFMT	Surf field mastitis test
VP	Vogas Proskauer test
WST	White side test