

شبكة المعلومات الجامعية التوثيق الإلكتروني والميكروفيلو

بسم الله الرحمن الرحيم





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جامعة عين شمس التوثيق الإلكتروني والميكروفيلم قسم

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Detection of Colistin Resistant Gram Negative Bacilli in Intensive Care Unit Patients Admitted to Ain Shams University Hospitals

Thesis

For Partial Fulfillment of **Master Degree** in **Medical Microbiology and Immunology**

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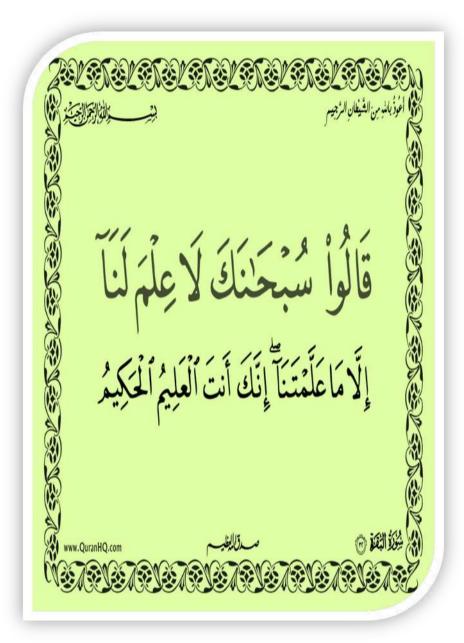
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List of Abbreviations

AST : Antimicrobial susceptibility testing

ATP : Adenosine triphosphate

BMD : Broth microdilution method

CAMPs : Cationic antimicrobial peptides

CLED : Cystine-Lactose-Electrolyte-Deficient-medium.

CLSI : Clinical and Laboratory Standards Institute.

CMS : Colistin methanesulfonate.

CPSs : Capsular polysaccharides

CSU : catheter-stream urine

Dl : Deciliter

DTT : Dithiothreitol

EA : Essential agreement.

ECV : epidemiological cutoff value.

EDETA : Ethylenediaminetetraacetic acid

ESBL : Extended-spectrum β-lactamase

ETA : Ethanolamine.

GI : Gastrointestinal

GNB : Gram-negative bacteria.

HPLC: High-Performance Liquid Chromatography.

ICU: Intensive Care Unit

IU : International unit

IV : Intravenous

Kdo : Ketodeoxyoctulosonate.

Kg : Kilo Gram

KPC : *Klebsiella pneumoniae* carbapenemase

LAMP : Loop-mediated isothermal amplification.

L-Ara4N : 4-amino-4-deoxy-L-arabinose.

LPS: Lipopolysaccharide.

MBLs : Metallo-beta-lactamases

Mcr : Mobilized colistin resistance

MDR : Multi drug resistance.

Mg : Milli Gram

MH : Muller Hinton

MMS : MICRONAUT MIC-Strip.

MSU : Mid-stream urine samples

MTS : MIC Test Strip.

Ng : Neisseria gonorrheae

Nm : Neisseria meningitidis

OMP : Outer membrane porines

OST : Osthole

PCR : Polymerase Chain Reaction

PEA : Phosphoethanolamine

PR : Plasmid-borne

SPSS : Statistical package for Social Science.

STC : SensitestTM Colistin

TA : Tracheal aspirate

TCS: Two-component system

UV : Ultraviolet light

VME : Very major error.

WHO : World Health Organization.

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Abstract

Background: Colistin is the last choice for serious infections caused by multidrug-resistant (MDR) Gram negative bacteria (GNB) and one of the prominent causes for spreading the resistance is Plasmid-borne (PR) Mobile colistin Resistance (*mcr*). Broth microdilution method (BMD) is the reference tool for colistin MIC determination, but it has many obstacles, so commercial BMD methods had been developed that are more user-friendly than the reference method and (Liofilchem ® ComASPTM) is one of them, which we used to determine colistin MIC in this study.

Objective: to detect colistin resistant gram negative bacilli by ComASPTM Colistin (formerly Sensi TestTMColistin) among Intensive Care Unit (ICU) patients admitted to Ain Shams university hospitals and screen the presence of *mcr-1* gene by Polymerase Chain Reaction (PCR) in colistin resistant isolates.

Methodology: This observational cross-sectional study was performed in the Medical Microbiology and Immunology Department, Faculty of Medicine, Ain Shams University between June 2019 to November 2019. One hundred isolates of Gram negative bacilli were obtained from patients admitted at different ICUs of Ain Shams University

Hospitals. Full identification was done by conventional microbiological methods, Then MIC was measured for all isolated organisms by using commercial BMD ComASPTM Colistin. Lastly, PCR was done for colistin resistant isolates to detect *mcr-1* gene.

Results: 60% of the Gram negative bacilli isolates were *K.pneumoniea*. Colistin resistance was 14% among 100 (GNB), Prevalence of *mcr-1* gene was 7.1%.

Conclusion: Commercial BMD ComASPTM Colistin is a simple and uncomplicated method for detecting colistin susceptibility.

Keywords: Colistin resistance, *mcr-1* gene, ComASPTM Colistin.