Enhanced Detection of Methicillin Resistant *Staphylococcus aureus* (MRSA) & Effect of some Local Agents on them

Thesis

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Contents

Continued..

Continued..

Continued..

List of Tables

Continued..

List of Figures

Continued..

List of Abbreviations

Abbreviation	Full term
AST	Active survillance test
β-lactam	Beta lactam
BlaZ	BLaZ gene
CA-MRSA	Community acquired methicillin resistant *Staphylococcus aureus*
Cao	Coagulase
ccr gene	cassette chromosome recombinase gene
ccrA/ccrB or ccrC	cassette chromosome recombinase A/B or C
CDC	Center for disease control and prevention
CLSI	Clinical and laboratory standard institute
CoNS	Coagulase negative *Staphylococci*
DHFR	Dihydrofolate reductase
DNase	Deoxyribonuclease
EPIC	European Prevalence of Infection in Intensive Care Study
EU	European Union
FAME	fatty acid modifying enzyme
Fc /IgG	(Fragment, crystallizable)/ Immunoglobulin G
FDA	Food and Drug administration
FEM	Factor Essential for Methicillin
Fn	Functional Description
H_2O	Water molecule
H_2O_2	Hydrogen peroxide
HAIs	healthcare-associated infections (HAIs)

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Abbreviation	Full term
HA-MRSA	Health care associated methicillin resistant *Staphylococcus aureus*
HCW	Health care workers
HIV	Human Immunodeficiency Virus
Hlg	Hlg locus
ICU	Intensive Care Unit
IDSA	Infectious Diseases Society of America
IL-8	Interleukin-8
kDa	Kilo-dalton
luk	luk gene
lukF-PV and lukS-PV	lukF-PV and lukS-PV genes
MBC	Minimal bactericidal concentration
Mbp	Million base pairs
MDRB	Multidrug resistant bacteria
MGEs	mobile genetic elements
MHC	Major Histocompatibility Complex
MIC	Minimal inhibitory concentration
MRSA	Methicillin Resistant *Staphylococcus aureus*
MSA	Mannitol salt agar
MSCRAMMs	microbial surface components recognizing adhesive matrix molecules
MSSA	Methicillin Sensitive *Staphylococcus aureus*
Mu50	The first clinical strain of *S. aureus* resistant to vancomycin

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Abbreviation	Full term
NDM-1	New Dehli metallo-beta-lactamase 1.
Ng	Nano gram
NPV	Negative predictive value
Nuc	Nuclease
O2	Oxygen
PAA	Peracetic acid
PBP2	Pencillin binding protein 2
PBP2a	Pencillin binding protein 2a
PCR	Polymerase chain reaction
Ppm	Part per million
PPV	Positive predictive value
PVL	Panton Valentine leucocidin
rRNA	ribosomal RNA
SAK	Staphylokinase
SaPIs	*S. aureus* pathogenicity islands
SCCs	Staphylococcal cassette chromosomes
SCVs	Small-colony variants
SE	Staph. Enterotoxins
SEL	Staph. Enterotoxins like
Spa	Staphylococcal protein A
TESSy	The European Surveillance System
TNFR1	tumor necrosis factor receptor 1
TSST-1	toxic shock syndrome toxin-1
USA	The United States of America
VanA	Vancomycin resistance gene

Continued..

Abbreviation	Full term
VISA	Vancomycin intermediate resistant *Staphylococcus aureus*
Vitek	Immuno Diagnostic Assay System
VRE	Vancomycin resistant *Enterococci*
VRSA	Vancomycin resistant *Staphylococcus aureus*
WHO	World Health Organization

Abstract

In the present study, we use CHROMagar ™ medium as a rapid method taking only 24 hrs. for MRSA detection from 70 clinical specimens (exudates or pus) and 25 nasal swabs (health care personnel) in comparison to the conventional method which needs 48 hrs., the validity values obtained were 100% sensitivity, specificity, PPV and NPV of cefoxitin disc diffusion method versus 93.8% sensitivity, 100% specificity, 100% PPV and 97% NPV of the chromogenic agar in identification of MRSA isolates from nasal swabs, burn and wound discharge samples collectively. Also we test the effect of some antiseptics Agents on the MRSA isolates. The used antiseptics were acetic acid (5%), betadine (10%), sodium hypochlorite´´ dakin's solution´´ (4%) and H_2O_2 (10%). Minimal inhibitory concentration (MIC) & minimal bactericidal concentration (MBC) of the different antiseptics were measured against the *MRSA* isolates. These results revealed that acetic acid was effective in the range of 5% to 0.63%, while betadine was effective in the range of 10% to 1.25%, also H2O2 was effective in the range of 10% to 0.63% but Dakin's solution was effective in the range of 0.5% to 0.063%.

Keywords: *Staphylococcus aureus* - MRSA – Chromogenic agar – Conventional methods – local antiseptic agents.