



Detection and Genotyping of Methicillin Resistance *Staphylococcus aureus* Infection and Colonization of Surgery Patients

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CONTENTS

Title	Page No.
Abbreviations	I
List of Tables	IV
List of Figures	VI
Abstract	IX
Introduction	1
Aim of the work	5
1. Literature Review	
1.1 <i>Staphylococcus aureus</i>	6
1.1.1 History of <i>Staphylococcus aureus</i> strains discovery	6
1.1.2 Taxonomy and classification of <i>Staphylococcus</i> species	10
1.1.3 Morphology of <i>Staphylococcus aureus</i>	11
1.1.4 Culture conditions and characteristics	11
1.1.5 Habitat	12
1.1.6 Epidemiology of <i>S. aureus</i>	13
1.1.7 Genome of <i>Staphylococcus aureus</i>	14
1.1.8 Pathogenesis of <i>S. aureus</i>	16
1.1.9 Colonization of <i>S. aureus</i>	22
1.2 Methicillin Resistant <i>Staphylococcus aureus</i> (MRSA)	24
1.2.1 Evolution of MRSA	24
1.2.2 Epidemiology of MRSA	25
1.2.3 Differences between CA-MRSA and HA-MRSA	29

CONTENTS

Title	Page No.
1.2.4 Transmission of MRSA	31
1.2.5 Mechanism of resistance of MRSA	35
1.2.6 Risk factors for colonization and infection by MRSA	43
1.2.7 Laboratory Diagnosis of Staphylococcal Infections	45
1.2.8 Resistance of MRSA to antimicrobial agents	54
1.2.9 MRSA Decolonization and Treatment	58
2. Materials and Methods	
2.1 Materials	65
2.1.1 Population study	65
2.1.2 Patients information and data history	65
2.1.3 Media	66
2.1.4 Reagents, buffers and solutions	72
2.2 Methods	75
2.2.1 Samples collection	75
2.2.2 Culturing method	75
2.2.3 Identification of <i>S. aureus</i> isolates	75
2.2.4 Maintenance of MRSA isolates	79
2.2.5 Identification and differentiation of MRSA from other <i>S. aureus</i> isolates	79
2.2.6 Standards and criteria used for classification of MRSA in to Community Acquired and Hospital Acquired	81
2.2.7 <i>In vitro</i> antibiotics sensitivity testing of all CA-MRSA and HA-MRSA isolates	82
2.2.8 Genotypic detection of <i>mecA</i> , <i>femA</i> , <i>femB</i> , PVL genes and Intgron class I and II genes in MRSA by PCR	84

CONTENTS

Title	Page No.
2.2.9 Patients Management for MRSA Decolonization	91
2.2.10 Statistical analyses	92
3. Results	
3.1 Study population	93
3.2 Detection of Methicillin Resistance <i>S. aureus</i> MRSA from patients samples by conventional methods	97
3.3 Distribution of MRSA isolates	104
3.4 Classification of MRSA isolates	108
3.5 Susceptibility of all MRSA isolates (CA –MRSA and HA MRSA) to different antibiotics/ Antimicrobial classes	113
3.6 Genotyping of HA-MRSA and CA-MRSA isolates	119
3.7 Patients Management for MRSA Decolonization	138
4. Discussion	141
5. Summary	168
6. Conclusion and Recommendation	173
7. References	175
8. Index	221
8. Arabic Summary	240

APPREVIATIONS

ACH	Acute-Care Hospital/Healthcare
ACM	Arginine Catabolic Mobile Element
AK	Amikacin
AMS	Ampicillin/sulbactam
AUG	Amoxicillin/ Clavulanic Acid
BHI	Brain heart infusion broth
BPEI	Branched Poly Ethylenimine
BSI	Blood Stream Infection
C	Chloramphenicol
CA	Community Acquired
CDC	Centers for Disease Control and Prevention
CIP	Ciprofloxacin
CLSI	Clinical and Laboratory Standards Institute
CNS	Coagulase Negative Staphylococci
<i>crr</i>	Chromosome recombinase Ge
CV	Core Variable
CXM	Cefuroxime
DA	Clindamycin
D-Ala-D-Ala	D-alanyl-D- alanine
DNA	Deoxyribonucleic acid
DNase	Deoxyribonuclease
dsDNA	double stranded DNA
E	Erythromycin
EDTA	Ethylene Di-amine Tetra Acetic acid
ELISA	Enzyme linked immunosorbent assay
EMRSA	Epidemic MRSA
ETT	Endo-Tracheal Tube
F	Nitrofurantoin
FDA	Food and Drug Administration
FOX	Cefoxitin
HA	Hospital/Healthcare Acquired
HAIs	Healthcare-Associated Infections
ICU	Intensive Care Unit
IDSA	Infectious Disease Society of America
IPM	Imipenem

APPREVIATIONS

laMRSA	livestock-associated MRSA
LTCF	long-term care facilities
LZD	Linezolid
<i>mecA</i>	Methicillin Resistance Gene
MEM	Meropenem
MGE's	Mobile Genetic Elements
MHC	Major Histocompatibility Complex
MIC	Minimum Inhibitory Concentration
MRSA	Methicillin Resistant <i>Staphylococcus aureus</i>
MSA	Mannitol salt agar
NAMRU 3	Naval Medical Research Unit No. 3
OD	Optical Density
OFX	Ofloxacin
ORSAB	Oxacillin Resistance Screening Agar Base
PBP	Penicillin-Binding Protein
PCR	Polymerase Chain Reaction
PRSA	Penicillin-resistant <i>S. aureus</i>
PVL	Panton Valentine leukocidin
Q-D	Quinupristin-dalfop
RA	Rifampin
rDNA	ribosomal DNA
RNA	Ribonucleic Acid
SA	<i>Staphylococcus aureus</i>
SAg	Super-Antigen Genes
SaPIs	<i>Staphylococcus aureus</i> Pathogenicity I
SCF	Cefoperazone / Sulbactam
SDW	Sterile Distilled Water
SEM	Scanning Electron Microscopy
SSI	Surgical site infection
SXT	Trimethoprim/ sulfameth
TAE	Tris Acetate EDTA
TE	Tri-HCl EDTA
TEC	Teicoplanin
<i>Tn</i>	Transposons
TSB	Tryptone soya broth
TSST-1	Toxic shock syndrome toxin
UTI	Urinary tract infection

APPREVIATIONS

VA	Vancomycin
VISA	Vancomycin Intermediate <i>Staphylococcus aureus</i>
VRSA	Vancomycin Resistant <i>Staphylococcus aureus</i>

LIST OF TABLES

No	Title	Page
1	Virulence factors of <i>S. aureus</i>.	17
2	Diameter of zone of inhibition (in mm) of different group of antibiotics according to CLSI (2012), with their mode of action.	83
3	Primers used to initiate PCR.	87
4	Amplification reaction components setup of reaction master mix for each 25- μ l reaction.	88
5	Age ranges for all subjected Patients.	94
6	Distribution of collected samples per genders.	95
7	Results of cefoxitin 30 μ g disc diffusion susceptibility test and ORSAB sub-culturing.	100
8	Percentage of MRSA isolates infections among <i>S. aureus</i> isolates.	103
9	Percentage and distribution of MRSA positive isolates per Gender.	104
10	Distribution of MRSA as per age ranges.	105
11	Distribution of MRSA isolates relative to each clinical site.	107
12	Percentage and distribution of CA-MRSA and HA-MRSA in different clinical sites.	109
13	Distribution and classification of CA-MRSA and HA-MRSA per gender.	110
14	Distribution of CA-MRSA and HA-MRSA as per age ranges.	112
15	Susceptibility pattern of MRSA isolates to different antibiotics (AB).	114
16	Percentages of susceptibility of CA-MRSA and HA-MRSA to different antibiotics.	116
17	Prevalence of different tested genes in all MRSA isolates.	134

LIST OF TABLES

No	Title	Page
18	Prevalence of different tested genes in HA-MRSA and CA-MRSA.	135
19	Correlation between clinical site of specimens and existence of PVL, integron I and integron II genes in MRSA isolates.	137
20	Percentage of successful MRSA decolonization from nasal, groin and axilla.	139

LIST OF FIGURES

No	Title	Page
1	Colonies of Staphylococcus aureus.	12
2	Distributions of Patients per Age.	94
3	Distribution of collected samples per genders.	95
4	Distribution of collected samples and specimens as per deferent sites.	96
5	Gram stained film prepared from the identified S. aureus colonies.	97
6	Growth of MRSA on mannitol salt agar (MSA), oxacillin resistance screening agar base (ORSAB) and disk diffusion susceptibility test.	99
7	Positive catalase test.	101
8	Growth of MRSA on deoxyribonuclease (DNase) agar.	102
9	Positive tube coagulase test	102
10	Percentage of MRSA isolates infections among S. aureus isolates.	103
11	Percentage of patients with individual MRSA-positive isolates.	104
12	Percentage and distribution of MRSA relative to gender.	105
13	Distribution of MRSA relative to age ranges.	106
14	Percentage and distribution of positive MRSA samples in each clinical site.	107
15	Distribution of CA-MRSA and HA-MRSA in different clinical sites.	109
16	Percentage, distribution and classification of positive MRSA per gender.	111
17	Distribution of CA.MRSA and HA-MRSA as per different age ranges	112

LIST OF FIGURES

No	Title	Page
18	Susceptibility pattern of MRSA isolates to different antibiotics.	115
19	Susceptibility pattern of CA-MRSA isolates to different antibiotics.	117
20	Susceptibility pattern of HA-MRSA isolates to different antibiotics.	118
21	Ethidium bromide-stained agarose gel of specific PCR products of mecA gene for some of HA-MRSA bacteria isolates.	120
22	Ethidium bromide-stained agarose gel of specific PCR products of mecA gene for some of CA-MRSA bacterial isolates.	121
23	Ethidium bromide-stained agarose gel of specific PCR products of femA gene for some of HA-MRSA bacteria isolates.	122
24	Ethidium bromide-stained agarose gel of specific PCR products of femA gene for some of CA-MRSA bacteria isolates.	123
25	Ethidium bromide-stained agarose gel of specific PCR products of femB gene for some of HA-MRSA bacteria isolates.	124
26	Ethidium bromide-stained agarose gel of specific PCR products of femB gene for some of CA-MRSA bacterial isolates.	125
27	Percentage of existence of femB gene in CA-MRSA.	125
28	Ethidium bromide-stained agarose gel of specific PCR products of lukS-PV and lukF-PV (PVL) gene of HA-MRSA isolates.	126
29	Percentage of existence of PVL gene in HA-MRSA.	127

LIST OF FIGURES

No	Title	Page
30	Ethidium bromide-stained agarose gel of specific PCR products of <i>lukS</i> -PV and <i>lukF</i> -PV (PVL) gene of CA-MRSA isolates.	128
31	Percentage of existence of PVL gene in CA-MRSA.	128
32	Ethidium bromide-stained agarose gel of specific PCR products of class I integron gene of HA-MRSA isolates.	129
33	Ethidium bromide-stained agarose gel of specific PCR products of class II integron gene of HA-MRSA isolates.	130
34	Percentage of prevalence of integrons class I and class II genes in HA-MRSA.	131
35	Ethidium bromide-stained agarose gel of specific PCR products of class I Integron gene of CA-MRSA isolates.	132
36	Ethidium bromide-stained agarose gel of specific PCR products of class II integron gene of CA-MRSA isolates.	133
37	Percentage of prevalence of integrons class I and class II in CA-MRSA.	133
38	Prevalence of existence of different genes in MRSA isolates.	135
39	Prevalence of existence of different genes in HA-MRSA and CA-MRSA isolates.	136
40	Correlation between clinical site of specimens and existence of PVL, integron class I and integron II genes in MRSA isolates.	137
41	Percentage of colonized MRSA isolates relative total isolated MRSA.	138
42	Percentage of successful MRSA decolonization from each site (nasal, groin and axilla).	139
43	Percentage of total successful MRSA decolonization.	140

Abstract

Methicillin-resistant *Staphylococcus aureus* (MRSA) is one of the major health hazards responsible for a large number of nosocomial (hospital acquired) infections worldwide and became of greater public health concern since the emergence of community acquired MRSA.

Out of 338 *Staphylococcus aureus* isolates collected from 374 patients, 108 (32.2 %) showed positive growth on Oxacillin Resistance Screening Agar Base (ORSAB) selective media for MRSA while only 105 (31.1%) isolates showed resistance to 30 µg cefoxitin susceptibility test and classified as MRSA. Among the MRSA isolates (105), 77 (73.3%) were identified as community acquired (CA) MRSA and 28 (26.7%) isolates were hospital acquired (HA) MRSA.

The frequency of resistant and susceptibility towards 19 antibiotics revealed that all MRSA (100%) isolates were sensitive to vancomycin (VA 30 µg) and linezolid (LZD 30 µg).

All of CA-MRSA and HA-MRSA isolates were screened for *mecA*, *femA*, *femB*, *lukS*-PV and *lukF*-PV (PVL) genes and intgrons class I and class II genes. Both *mecA* and *femA* genes were present in all (100%) HA-MRSA and CA-MRSA isolates. *femB* gene was recovered from all HA-MRSA isolates and 72 (93.5%) of CA-MRSA isolates.

PVL gene was detected in 8 (28.6 %) HA-MRSA isolates and seventy-one (92.2%) CA-MRSA.

Class I integron gene was recovered from 17 (60.7%) HA-MRSA isolates and 29 (37.7%) CA-MRSA isolates, while class II integron gene was recovered from only 3 (10.7%) HA-MRSA isolates and from five (6.5 %) CA-MRSA isolates.

Decolonization measures were applied on all colonized sites as per CDC, (2007) recommendation and the results of successful decolonization were 90.9% from nasal, 93.9% from groin and 80% from axilla and the total percentage of 91.8% successful decolonization was achieved.