شبكة المعلومات الجامعية

بسم الله الرحمن الرحيم

شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم

شبكة المعلومات الجامعية

جامعة عين شمس

التوثيق الالكتروني والميكروفيلم

قسم

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بالرسالة صفحات لم ترد بالاصل

GENOTYPIC AND PHENOTYPIC MARKERS OF NOSOCOMIAL *STAPHYLOCOCCUS AUREUS* STRAINS ISOLATED FROM SUEZ CANAL UNIVERSITY HOSPITAL IN ISMAILIA

Thesis in Partial Fulfillment of

M.D. Degree in Medical Microbiology & Immunology

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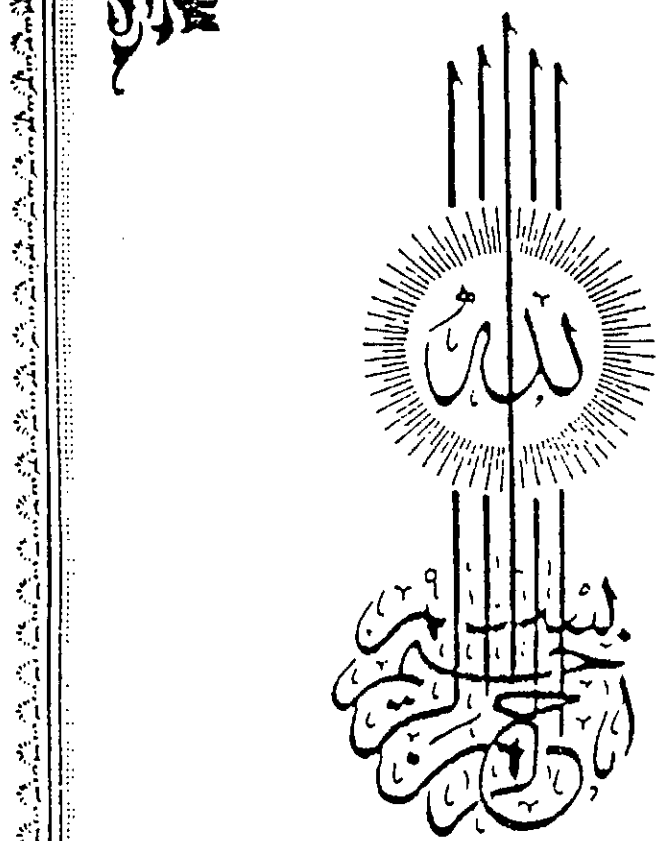

قَالُوا سُبْحَانَكَ لَا عِلْمَ لَنَا إِلَّا مَا
عَلَّمْتَنَا إِنَّكَ أَنْتَ الْعَلِيمُ الْحَكِيمُ.

صَدَقَ اللهُ الْعَلِيُّ
البقرة - ٣٢-

DEDICATED TO MY PARENTS

MY HUSBAND & CHILDREN

MOHAMED, RANA AND AHMED

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List of Abbreviations

AMC: Amoxicillin-Clavulanic acid.

AP PCR: Arbitrary Primed Polymerase Chain Reaction.

BOMRSA: Borderline Methicillin Resistant *S. aureus*.

CDC: Centers for Disease Control & Prevention.

CE: Cephradine.

CHEF DrII: Contour-Clamped Homogenous Electric Field Drive II.

CTX: Cefotaxime.

CXM: Cefuroxime.

DP: Methicillin.

E: Erythromycin.

E. coli: Escherishia coli.

FA: Fatty Acids.

GM: Gentamycin.

HAI: Hospital Acquired Infection.

HAP: Hospital Acquired Pneumoniae.

HBA: Horse Blood Agar.

HPF: High Power Field.

ICS: International Collaborative Study.

ICU: Intensive Care Unit.

Kb: Kilobase-pair.

ODD: Oxacillin Disk Diffusion.

OFX: O'Floxacin.

OSAS: Oxacillin Salt Agar Screen.

LSM: Lipovitellin Salt Mannitol Agar.

Md: Megadalton.

MIC: Minimal Inhibitory Concentration.

MODSA: Modified Penicillin Binding Protein *S. aureus*.

MRSA: Methicillin Resistant *S. aureus*.

MSSA: Methicillin Sensitive *S. aureus*.

NCCLs: National Committee for Clinical Laboratory standards.

PBP2a: Penicillin Binding Protein2a.

PCR: Polymerase Chain Reacion.

PFGE: Pulsed Field Gel Electrophoresis.

PPA: Phenolphthalein Phosphate Agar.

RAPD: Random Amplified Polymorphic DNA.

RD: Rifampicin.

REA: Restriction Endonuclease Analysis.

RFLP: Restriction Fragment Length Polymorphism.

RTD: Routine Test Dilution.

***S. aureus*:** *Staphylococcus aureus*.

Spp.: Species.

SSMA: Soft Salt Mannitol Agar.

SXT: Trimethoprim-Sulfamethoxazole.

TE: Tetracycline.

TSS: Toxic Shock Syndrome.

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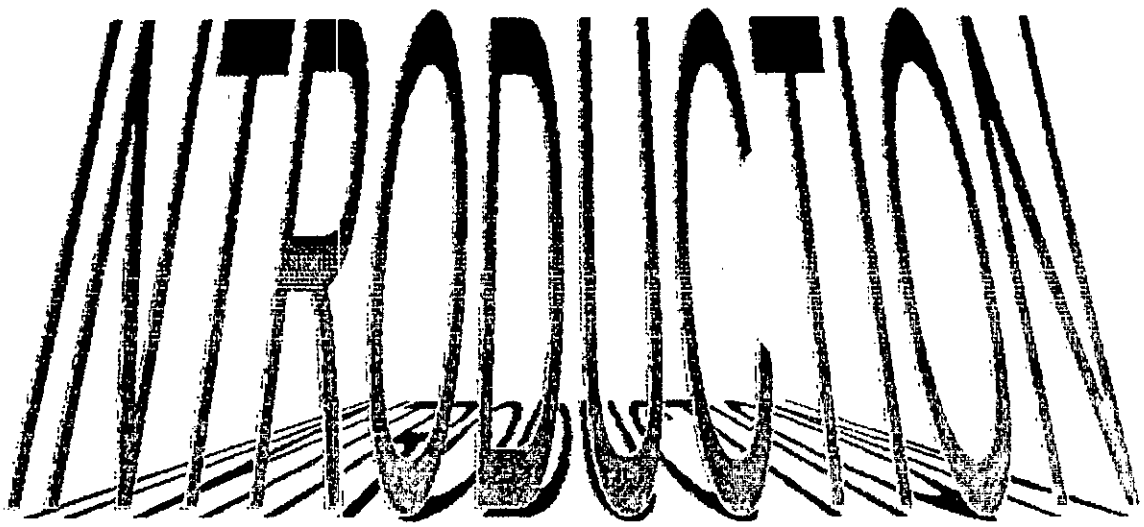
INTRODUCTION

Introduction

The genus Staphylococci is Gram positive cocci that is non-motile, non-sporing and is the most important group in the family Micrococcaceae **(Wagner, 1992).** *S. aureus* is among the most prominent pathogens in both community-acquired and nosocomial infections **(Kloos and Lambe, 1991).** The close interaction between colonized susceptibility of the resident population and hospitalized patients, often leads to nosocomial outbreaks associated with a single strain **(Mulligan, *et al.*, 1993).**

Emergence of resistant strains to most antibiotics became a great problem in any hospital due to haphazard use of a wide range of antibiotics **(Horan, *et al.*, 1986).** Antibiotic resistance among nosocomial *S. aureus* strains became common, especially methicillin resistance **(Smeltzer, *et al.*, 1997 and Van-Wamel, *et al.*, 1995).** Resistance of staphylococci to several antimicrobial agents contributes to their ability to survive in the hospital environment and to spread among patients **(Brumfitt and Hamilton-Miller, 1989).** *S. aureus* was representing a major cause of surgical wound infection in a study in the center of disease and control (CDC, USA)), as the isolation rate was 25% **(Robert and Weinstein, 1998).**

Epidemiological markers are laboratory techniques used to distinguish between isolates of the same species **(Smeltzer, *et al.*, 1996).** Marker systems are used as tools in many areas of microbiology but most commonly are used to detect and confirm common source of outbreaks, routes of transmission and to establish relationships of patients isolates to one another and the environment **(Van-Belkum, *et al.*, 1995).**

Typing markers enable us to determine whether previously virulent clones are present in a set of strains or not and help in recognizing outbreaks **(Wenzel, 1985).** A useful marker should be sensitive and the typing profiles should be spread among the strains without any predomination. The method must be standardized to allow comparison of results from one laboratory to another and has good reproducibility and finally, typing techniques preferred to be easy to perform as well as inexpensive **(Tenover, *et al.*, 1994).**

No single typing technique available can fulfill all requirements of the discrimination between the isolates as for example phenotypic methods (biotyping, antibiogram, and phage) often lack a sufficiently high degree of resolution or are hampered by marginal reproducibility. On the other hand, genotypic methods (plasmid profile, pulsed field gel electrophoresis and polymerease chain reaction)