الآيـــــة

:

بسم الله الرحمن الرحيم

قال تعالى:

﴿اقْرَأْ بِاسْمِ رَبِّكَ الَّذِي خَلَقَ (١) خَلَقَ الإِنسَانَ مِنْ عَلَقٍ(٢)اقْرَأْ وَرَبُّكَ الأَكْرَمُ(٣)

الَّذِي عَلَّمَ بِالْقَلَمِ(٤) عَلَّمَ الإِنسَانَ مَا لَمْ يَعْلَمْ(٥)﴾

صدق الله العظيم

الايات (**١ من ٥**) من سورة العلق

Dedication

I dedicate this work to:

My parents

Who gave me the meaning of life

My brothers and Sisters

Who support me always

And to

Anyone who taught me characters

Acknowledgment

Firstly, I wish to pay my sincere respect and thanks to ALMIGHTY ALLAH, the Greatest and merciful in offering me health and strength to successfully accomplish this work.

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Abstract

Staphylococcus aureus is an important pathogen inflicting a variety of diseases affecting human health. Of the several disease-causing toxins released by virulent strains of the pathogen, is Panton Valentine Leukocidin (PVL).

This is a descriptive cross-sectional study conducted in the Research Laboratory, Sudan University of Science and Technology in the period from April to September 2012. The aim of this study was to detect PVL toxin encoded gene of *Staphylococcus aureus* within Methicillin Resistant *S. aureus* (MRSA) and assess its relation to the type of infection with the organism's virulence.

One hundred and seventy samples were collected from patients presented with clinical signs and symptoms of *Staphylococcus aureus* infecting different sites. Phenotypic cultural methods were adopted to identify the pathogen. Antibiotic susceptibility testing for methicillin was performed on the identified isolates. The DNA was extracted by phenol-chloroform method. Amplification of the gene coding for PVL was demonstrated using PCR analysis.

Out of 170 tested isolates, 89 were methicillin resistant *S. aureus* (MRSA), 15 methicillin intermediate *S. aureus* (MISA) and the 66 were Methicillin Sensitive *S. aureus* (MSSA).

The PVL gene was amplified from DNA extracted from 2 (2.2 %) MRSA isolated from patients presented with wound skin infections and 87 (97.8 %) MRSA isolates taken from different infection sites were negative to PVL gene.

This study concluded that released PVL toxin by MRSA was probably linked with severe infection of the patients. More sampling and research work are required to determine prevalence and role of the toxin in increasing disease severity among Sudanese patients.

الخلاصـــــــــة

المكورات العنقودية الذهبية من اهم الممرضات التي تلحق مجموعة من الأمراض التي تأثر علي صحة الإنسان. من عدة أمراض ناتجة عن السموم من السلالات الضارية، يوجد سم البانتون فلانتين ليكوسيدين.

هذة دراسة وصفية أجريت في مختبر أبحاث، جامعة السودان للعلوم والتكنولوجيا في الفترة من أبريل الى سبتمبر 2012. وكان الهدف من هذه الدراسة الكشف عن جين بانتون فالينتاين ليكوسيدين من المكورات العنقودية الذهبية المقاومة للميثيثلين, وتقييم ارتباطه بنوع الإصابة مع ضراوة البكتريا.

تم جمع 170 عينة من المرضى يعانون من الأعراض والعلامات الإكلينيكية للإصابة بالمكورات العنقودية الذهبية ومصابون في مواقع مختلفة من الجسم. وقد أعتمدت الطرق المظهرية والتزريعية للتعرف علي العوامل المسببة للأمراض.تم اجراء اختبار الحساسية للمضاض الحيوي الميثيثلين على العزلات التي تم التعرف عليها. تم إستخراج الحمض النووي من العينات بواسطة طريقة الفينول كلوروفورم. وتم اختبار البلمرة التسلسلي الجزيئي لتضخيم جين البانتون فالنتاين ليكوسيدين.

من 170 عينة، كان منهم 89 مكورات ذهبية عنقودية مقاومة للميثيثلين، 15 مكورت ذهبية عنقودية متوسطة الحساسية 66 ومنهم مكورات ذهبية حساسة للميثيثلين.

أظهرت النتائج أنه تم الكشف عن البانتون فالنتاين ليوكوسيدين جين في 2 من سلالة المكورات العنقودية الذهبية المقاومة للميثيثلين (2.2%) من إصابات الجروح، و 87 كانت سلبية (97.8%) والتي كانت من سلالة المكورات العنقودية الذهبية المقاومة للميثيثلين ايضا من عينات مختلفة.

إختتمت هذة الدراسة ان سم البانتون فلانتاين ليكوسيدين الذي صدر من المكورات الذهبية العنقودية المقاومة للميثيثلين مرتبطا مع حالات المعاناة الشديدة للمرضي . ويلزم مزيد من أعمال الفرز والبحوث لتحديد مدى إنتشار ودور هذا السم في زيادة المرض في المرضي السودانيين.

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List of abbreviations

TSST-1	Toxic shock syndrome toxin-1
ET	Exfoliative toxins
PVL	Panton–Valentine leukocidin
SE	Staphylococcal enterotoxins
CA-MRSA	Community-acquired methicillin-resistant *S.aureus*
MRSA	methicillin resistant *S.aureus*
MISA	Methicillin intermediate *S.aureus*
MSSA	Methicillin sensitive *S.aureus*
CONS	Coagulase-negative staphylococci
CRF	Coagulase reacting factor
H_2O_2	Hydrogen peroxide
IL	Interleukin
SSSS	Staphylococcal scalded skin syndrome
MSCRAMMs	Microbial Surface Components Recognizing Adhesive Matrix Molecules
VRSA	Vancomycin resistant *S.aureus*
MSA	Mannitol Salt Agar
$BrCl_2$	Barium chloride

SDS	Sodium dodecyl sulfate
CTAB	Compound Hexadecyl trimethyl Ammonium Bromide
SPSS	Statistical package for social sciences
NCCLS	National committee of clinical laboratory standard
TBE	Tris Borate EDTA
EDTA	Ethylene diamine tetraacetic acid