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بسم اللّه الرحمن الرحيم

شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم

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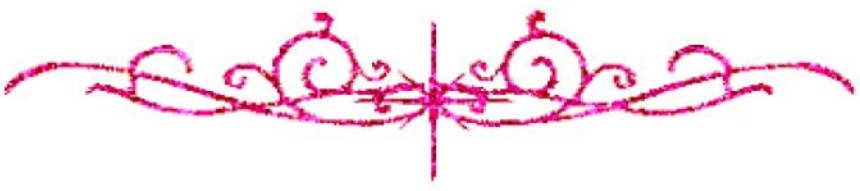

بالرسالة صفحات
لم ترد بالأصل

Rapid Identification and Antimicrobial Susceptibility of Gram Negative Bacteria Detected in Positive Blood Culture Bottles

Thesis

Submitted for Partial Fulfillment of
Master Degree in **Clinical Pathology**

By

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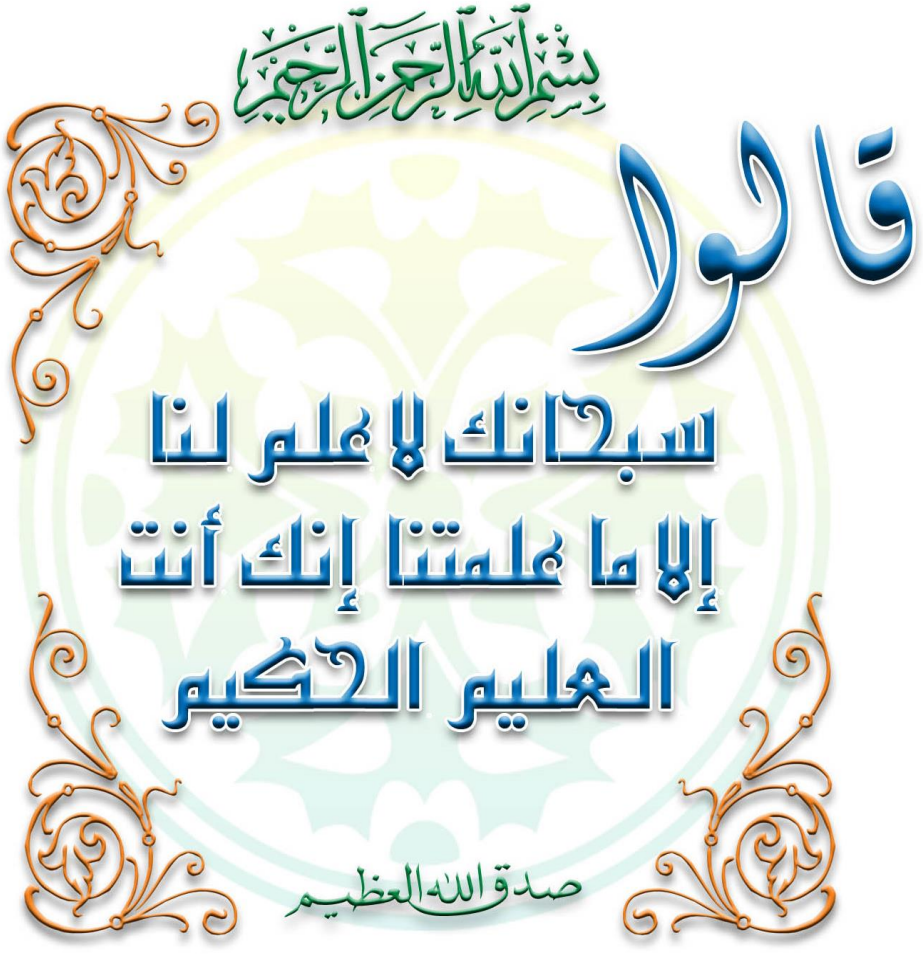

سورة البقرة الآية: ٣٢

ABSTRACT

Background: Blood stream infection (BSI) is one of the most serious situations in infectious disease .Accurate and timely identification of the causative agent and determination of its antimicrobial susceptibility profile are essential for guiding targeted and effective antimicrobial treatment. Current methods involve culturing of blood in a liquid medium and subsequently subculturing of signal positive bottles on solid media in order to obtain isolated colonies that can be further used in identification and susceptibility testing of the isolates. The standard method requires additional 48-72hours following the appearance of a positive signal in order to provide a reliable patient report. On the other hand, rapid identification of the causative agent and determination of its susceptibility profile by direct inoculation of the biochemical test media with the blood-broth mixtures from signal positive bottles and performing primary susceptibility testing might help reducing the time needed for provision of results compared to the standard isolated-colony based method and hence would help the rapid initiation of effective and targeted antimicrobial therapy and reduce the bacteremia-related morbidity and mortality.

Objective: The aim of the present study was to determine the accuracy and precision of the non-standard methods (direct identification and susceptibility testing using the blood/broth mixture) by comparing its results to those of the standard isolate-based identification and susceptibility testing methods.

Material and method: The study included 52 signal blood culture bottles yielding gram negative isolates. Bottles were selected amongst blood culture bottles submitted to the Main Microbiology laboratory, Ain Shams University hospital, for culture and antimicrobial susceptibility testing during the period between May 2018 and October 2018.

a portion of the blood-broth mixture was aspirated from positive blood culture bottles, after being well mixed, and was subcultured onto agar media for the isolation of the causative agent and subsequently determination of its antimicrobial susceptibility profile was performed. Another part of the aspirated blood-broth mixture was diluted with sterile saline, its turbidity was adjusted against a 0.5McFarland standard and was used to inoculate directly the biochemical test media panel used for the identification of gram negative organisms as well as to perform direct (primary) antimicrobial susceptibility.

Results: The present study revealed there was 100% categorical agreement between the results of the direct biochemical inoculation method and those of the standard isolate-based inoculation method regarding the identification of the causative agent. The results of the direct biochemical identification method were also consistent giving rise to a 100% within-run precision categorical agreement and a 100% between-run precision categorical agreement.

The overall categorical agreement between the results of the standard isolate-based AST method and the results of the direct (primary susceptibility) AST method was 96.3% for the

signal blood culture media. The major error rate was 0.5% whereas the minor error rate was 3.3% .

Consistent results were also obtained for the AST done directly from the signal blood culture bottles since the between-run and within-run precision categorical agreement were 96.3% and 98.6%, respectively.

Conclusion: the overall performance of the AST done directly from positive blood culture bottles fulfilled the acceptable performance criteria specified in the Cumitech 31A so the direct method can be used for the earlier determination of AST and identification of Gram negative bacteria and thus to reduce the time for early initiation of appropriate antibiotic

Acknowledgments

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Ola Ali Mahmoud Ali

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Abb.	Full term
ACCM	*American College of Critical Care Medicine*
AK	*Amikacin*
AMC	*Amoxicillin/clavulinic*
ANC	*Absolute neutrophil count*
ASM	*American Society of Microbiology*
AST	*Anti microbial susceptibility test*
BC-GN	*Gram-Negative- Blood Culture*
BC-GP	*Gram-Positive –Blood culture*
BP	*Blood pressure*
BSI	*Blood Stream Infection*
CAZ	*Ceftazidime*
CA	*Categorical agreement*
CBC	*Complete blood picture*
CFU	*Colony forming unit*
CIP	*Ciprofloxacin*
CLRs	*C-type lectin receptors*
CN	*Gentamicin*
CRO	*Ceftriaxone*
CRP	*C-reactive protein*
CTX:	*Cefotaxime*
DCs	*Dendritic cells*
DIC	*Disseminated intravascular coagulopathy*
DNA	*Deoxyribonucleic acid*
DO	*Doxycycline*
EOS	*Early onset sepsis*
ESI-MS	*Electrospray ionization mass spectrometry*
FEB	*Cefepime*
FISH	*Fluorescent in situ hybridization*
FOX	*Cefoxitin*
GBS	*Group B streptococci*
G-CSF	*Granulocyte colony-stimulating factor*
GN	*Gram negative*