Significance of Rapid Screening Methods as Rule-out Tests for Urinary Tract Infections in Catheterized Patients

Thesis

Submitted for partial Fulfillment of Master Degree in Basic Medical Science
(Microbiology & Immunology)

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2012

إمكانية إستخدام طرق الفحص السريعة كدليل على عدم وجود عدوى المجارى البولية فى المرضى المقثطرين

رسالة
توطئة للحصول على درجة الماجستير
فى العلوم الطبية الأساسية
(الكائنات الدقيقة والمناعة)

مقدمة من

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2012

First and foremost thanks to "ALLAH" who is the most beneficial and the most merciful.

I would like to express my deep sincere appreciations and thanks to my great teacher ***Prof. Maha Muhammad Fathy*** *Professor of Medical Microbiology and Immunology, Faculty of Medicine, Ain Shams University, who was been kind enough to spare no effort and no time to advice, to supervise, to teach and to give willingly and lavishly from her inexhaustible treasure of knowledge.*

I wish to thank ***Dr. Soha Abd El-Rahman El-Hady*** *Ass. Prof. of Medical Microbiology & Immunology, Faculty of Medicine, Ain Shams University for her kind supervision, tremendous assistance and valuable criticism.*

I am greatly honored to express my deep gratitude to Brigadier-General ***Dr. Raafat Zaher Abd El-Rahman,*** *Consultant of Microbiology and Immunology, Military Central Labs, Military Medical Academy. He gave me much of his time, experience, meticulous advice, kind support and mastery teaching, without his care this work could never be within hands.*

I also want to thank all my colleagues in Military Central Labs for their kind help and encouragement especially Major ***Dr. Ahmed Gad Taha.***

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List of Abbreviations

ABUTI	Asymptomatic Bacteremic Urinary Tract Infection
AUC	Area under curve
CA-ASB	Catheter associated asymptomatic bacteruria
CAPD	Continuous ambulant peritoneal dialysis
CAUTI	Catheter associated urinary tract infection
CDC	The Center for Disease Control and Prevention
CFU	Colony forming units
CLED	Cystine-Lactose-Electrolyte-Deficient
CNS	Coagulase-negative staphylococci
CORUR	Corynebacterium urealyticum
COS	Corynebacterium species unspecified
CRE	Carbapenem- Resistant *Enterobacteriaceae*
CRKP	Carbapenem- Resistant *Klebsiella pneumoniae*
CSU	Catheter specimen of urine
CTX-M	Cefotaxime-M
ECDC	European Centre for Disease Prevention and Control
ESBLs	Extended spectrum ß-lactamases
GAG	Glycosaminoglycan
HAIs	Healthcare-acquired infections
HPF	High power field
ICU	Intensive Care Unit
IVP	Intravenous pyelogram

LE	Leucocyte esterase
LTC	Long-term care
LTCF	Long-term care facilities
LUTI	Lower urinary tract infection
MBLs	Metallo beta lactamases
MRI	Magnetic resonance imaging
MDR	Multiple drug resistance
NDM-1	New Delhi metallo-β-lactamase-1
NDM-2	New Delhi metallo-β-lactamase-2
NPV	Negative predictive value
OIF	Oil immersion field
OUTI	Other Urinary Tract Infection
OXA-48	Oxacillinases-48
PEARLS	Pan European Antimicrobial Resistance using Local Surveillance
PPV	Positive predictive value
ROC	Receiver Operating Curve
SHV-1	Sulfhydryl variable-1
SHV-2	Sulfhydryl variable-2
SUTI	Symptomatic Urinary Tract Infection
TEM-1	Temoniera-1
TEM-2	Temoniera-2
TEM-3	Temoniera-3
UTI	Urinary tract infection
UUTI	Upper urinary tract infection

TSST-1	Toxic shock syndrome toxin-1
UA	Urinalysis
VIM	Verona Integron-Encoded Metallo- β -Lactamase
VUR	Vesicouretheral reflux
WBC	White blood cell

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Introduction and Aim of the Work

Introduction

Urinary tract infection (UTI) is the most common nosocomial infection and constitutes about (30% - 40%) of all hospital acquired infection**.** Most of these infections follow urinary catheterization. Some studies found higher risk of hospital mortality in patients with catheter-associated UTI **(*Rosenthal et al., 2003*)**. Many risk factors have been demonstrated to increase the risk of catheter associated UTI. These include prolonged catheterization, other infections, diabetes, malnutrition, renal failure, placement of the drainage tube above the level of the bladder, female gender and old age (***Tambyah 2004***).

As antimicrobial resistance rates increase, there is growing concern about inappropriate and unnecessary antimicrobial use (***Fahey et al., 2003***). Suspected UTI is one of the most common indications for antimicrobial use, with much prescribing of antimicrobials based on clinical symptoms and signs without confirmation by culture (***Andrew et al., 2006***). The most common organisms infecting the urinary tract include *E.coli, Klebsiella pneumoniae, Proteus species, Staphylococcus species and Pseudomonas* (***Wagenlehner, et al., 2006***). The emergence of multidrug-resistant extended-spectrum β-lactamase-producing Gram negative organisms emphasizes the increasing risks associated with unnecessary antimicrobial use (***Colodner et al., 2004***).

The frequency of UTI generates a significant workload for the laboratory. Most specimens sent to a laboratory will show no evidence of infection when tested, and consequently, there has been considerable interest in ways to screen out specimens before processing them for culture by a rule-out test strategy as microscopic examination of urine and dipstick urinalysis testes (***Smith et al., 2003***).

Aim of the Work

This work aimed at evaluating the performance of simple screening methods as microscopic urine analysis and dipstick tests for urine leukocyte esterase and nitrite in order to use the negative results of these methods as rule out tests to exclude catheter associated urinary tract infections in hospitalized patients in Kobry Elkobah Military Hospital. Moreover, the antimicrobial profile of the isolated pathogens was determined to help guiding empirical antimicrobial therapy.

Review of Literature