Evaluation of the Chromogenic medium ChromID CPS for Isolation & Identification of Urinary Tract Pathogens

Thesis

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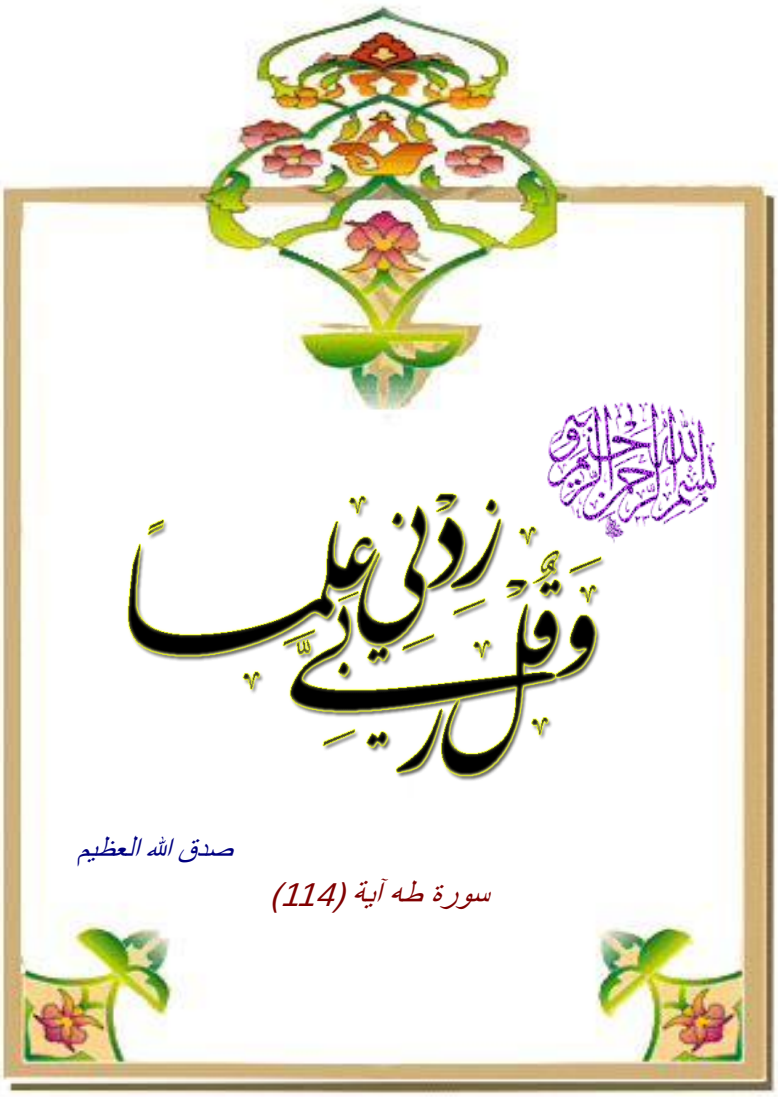

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Nehal Fathy Ahm

Contents

List of Abbreviations

Afa	:	Afimbrial adhesions
AMP	:	Antimicrobial peptides
ASB	:	Asymptomatic bacteriuria
BA	:	Blood agar
CAUTI	:	Catheter-associated urinary tract infection
CDC	:	Centers for Disease Control
CFU	:	Colony Forming Unit
CLED	:	Cystine lactose electrolyte-deficient
CNF1	:	Cytotoxic necrotizing factor 1
DsDNA	:	Double-stranded DNA
ED	:	Emergency departments
GBS	:	Group B Streptococcus agalacticae
HBD2	:	Human betadefinsins 2
HIV	:	Human immunodeficiency virus
IDSA	:	Infectious Disease Society of America
KESC	:	Klebsiella, Enterobacter, Serratia a Citrobacter
KTRs	:	Kidney transplantation recipients
LE	:	Leukocyte esterase
MAC	:	MacConkey agar media
MSU	:	Mid-stream sample of urine

List of Abbreviations (Cont.)

SCIs	:	Spinal cord injuries
THP	:	Tamm-Horsfall protein
UPEC	:	Uropathogenic *E.coli*
UTIs	:	Urinary tract infections

List of tables

List of tables (Cont.)

List of Figures

List of Figures (Cont.)

Introduction

Urinary tract infections (UTI) are considered one the most common bacterial infections. They affect up to 1 million individuals annually. There are limited data on t true impact of UTIs in the developing world. In USA, UT are responsible for 7 million physician visits and more th 100,000 hospital admissions annually ***(Renuart et al., 2013***

The total annual direct and indirect cost due to UTIs the US alone is estimated to be greater than US$ 1.6 billi ***(Talan et al., 2004)***. Globally, they cause not only significant amount of morbidity, but also a significa financial burden ***(Habte et al., 2009).***

Rapid identification of the infecting organism provid useful information to the clinician for appropriate antibio choice prior to organism susceptibilities being available a can alert infection control teams to potential outbrea ***(Merlino et al., 1996).***

Most urinary tract infections are caused by gra negative bacteria like *Escherichia coli, Klebsiella sp Proteus mirabilis, Pseudomonas aeruginosa, Acinetobac spp.,* and *Serratia spp,* and gram-positive bacteria such

Enterococcus spp and *Staphylococcus spp* ***(Grude et a 2001)***.

In recent years, a range of chromogenicmedia has be made commercially available for the improved isolation a identification of urinary tract pathogens ***(Scarparo et a 2002)***. These media detect key microbial enzymes diagnostic markers for pathogens through the use "chromogenic" substrates incorporated into a solid-aga based matrix ***(Van et al., 2011).***

In contrast to conventional culture media, chromogen media allow direct colony color-based identification of t pathogen from the primary culture ***(Kumar et al., 2010)***. Th not only minimizes the need for further identification tes but also reduces the time required to report the results to t clinician to facilitate early initiation of antibiotic thera ***(Lakshmi et al., 2004)***.

In addition, routine use of chromogenic media carri the potential for cost savings in the clinical microbiolo laboratory since they could potentially save the time a expense of performing assimilation panels and oth fermentative or biochemical tests ***(Horvath et al., 2003).***

Furthermore, the diagnosis of urinary tract infectio contributes significantly to the daily workload in microbiology laboratory; hence any innovation that tends reduce the workload is always welcome when a high-qual standard is still maintained ***(Hengestler et al., 1997).***

Aim of the work

To compare between the use of chromID CPS agar a the conventional culture and identification methods as reference to conclude the best way for rapid diagnosis of t most frequent urinary tract pathogens reducing the burden biochemical characterization, allowing the clinician commence an initial course of antibiotics.

Urinary Tract Infections

Urinary Tract Infection (UTI) is one of the mo common infections which affect humans, cause significa distress to individuals, and is associated with high healthca and social costs. If UTI is not treated by primary health ca providers, it can cause serious potential consequences, su as pyelonephritis and bacteremia. In addition, it is believ that UTIs have become increasingly resistant to first-li antibiotic therapy ***(Tehrani et al., 2014).***

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UTIs account for more than 100,000 hospi admissions annually, ***(Foxman et al., 2002)***. They al account for at least 40% of all hospital-acquired infectio and are, in the majority of cases, catheter-associate Bacteriuria develops in up to 25% of patients who require urinary catheter for > 7 days, with a daily risk of 5%. It h been estimated that an episode of healthcare-associat (nosocomial) bacteriuria adds significantly to the direct co of acute-care hospitalization. In addition, the pathogens a fully exposed to the nosocomial environment, includi selective pressure by antibiotic or antiseptic substanc Nosocomial UTIs therefore comprise perhaps the largo

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