بسم الله الرحمن الرحيم

MONA MAGHRABY

شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم

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جامعة عين شمس

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MONA MAGHRABY

Screening of Asymptomatic Bacteriuria in Sickle Cell Pediatric Patients

Thesis

Submitted for Partial Fulfillment of Master Degree in Clinical Pathology

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2021

سورة البقرة الآية: ٣٢

Acknowledgment

First and foremost, I feel always indebted to ALLAH, the Most Kind and Most Merciful.

I'd like to express my respectful thanks and profound gratitude to Assist. Prof. Dalia Hosni Abdel Hamid, Assistant Professor of Clinical Pathology, Faculty of Medicine, Ain Shams University for her keen guidance, kind supervision, valuable advice and continuous encouragement, which made possible the completion of this work.

I am also delighted to express my deepest gratitude and thanks to Assist. Prof. Marwa Abdel Rasoul El-Ashry, Assistant Professor of Clinical Pathology, Faculty of Medicine- Ain Shams University, for her kind care, continuous supervision, valuable instructions, constant help and great assistance throughout this work.

I am deeply thankful to Dr. Sara Mostafa Makkeyah, Lecturer of Pediatrics, Faculty of Medicine - Ain Shams University, for her great help, active participation and guidance.

Nouran Osama

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Abb.	Full term
ACS	**Acute chest syndrome**
AER	**Albumin excretion rate**
ASB	**Asymptomatic bacteriuria**
AST	**Antimicrobial susceptibility testing**
BA	**Blood agar**
CA	**Chromogenic agar**
CFU	**Colony forming unit**
CLED	**Cystine lactose electrolyte deficient**
CMV	**Cytomegalovirus**
E.coli	***Escherichea coli***
EBV	***Epstein-Barr virus***
FISH	**Fluorescence in situ hybridization**
GFR	**Glomerular filtration rate**
Glu	**Glutamic acid**
Hb	**Hemoglobin**
HIV	**Human immunodeficiency**
HPF	**High power field**
MAC	**MacConkey agar**
MALDI-TOF	**Matrix-assisted laser desorption ionization-time of flight**
RBCs	**Red blood cells**
S. saprophyticus	*Staphoccocus saprophyticus*
S. typhi	*Salmonella typhi*
S.aureus	***Staphylococcus aureus***
SCA	**Sickle cell anaemia**
SCD	**Sickle cell disease**

List of Abbreviations Cont...

Abb.	Full term

SPP*..... *Species

Strept.pneumoniae.Streptococcus pnumoniae

UPEC..... Uropathogenic *E.coli*

UTIs ..... Urinary tract infections

Val ..... Valine

INTRODUCTION

Sickle cell disease (SCD) is a multi-systemic disease of episodic acute illness and severe organ damage. It is one of the autosomal-recessive monogenic disorders worldwide ***(Piel et al., 2017).*** SCD is a genetic mutation in which GTG is substituted for GAG in the sixth codon of the β-globin gene leading to replacement of the hydrophilic glutamic acid residue (Glu) with a hydrophobic valine residue (Val) at the sixth position in the β-globin chain, resulting in a mutated hemoglobin molecule in individuals RBCS ***(Eaton and Bunn, 2017)***.

Evidence from several studies indicated that SCD patients are more prone to develop bacteriuria compared to their healthy counterparts ***(Chukwu et al., 2011).*** Urinary tract infection (UTI) in SCD patients is precipitated by impaired immunological state like deficiency in serum opsonins and defective phagocytosis as well as altered blood flow in renal vasculature ***(Nicolle et al., 2005).***

Urine samples are relatively sterile. Bacteriuria is considered significant if colony count is equal to or greater than 1×10^5 CFU/ml ***(Rowe and Juthani, 2014)***, significant bacteriuria may be either symptomatic or asymptomatic ***(Vasudevan, 2014).*** Asymptomatic bacteriuria (ASB) is isolation of bacteria with count equal to or greater than 10^5CFU/ml in two consecutive appropriately collected fresh voided mid- stream urine samples of the same organism for a

child with no accompanying symptoms of infection ***(Nicolle et al., 2019).*** Urine culture is the gold standard method to diagnose ASB ***(Selek et al., 2017)***.

Traditionally Blood agar (BA) and MacConkey agar (MAC) media are being used together by most of the laboratories, Cystine lactose electrolyte-deficient (CLED) agar has been added lately. In last few decades, several chromogenic media have been developed and commercialized as ***UriSelect™ 4*** and ***CHROMagar*** media allowing direct and presumptive identification of organisms on the plate itself on the basis of distinct colony colour by reaction of genus-or species-specific enzyme with a suitable chromogenic substrate, this consequently reduce the burden of biochemical reactions and reduce the reporting time ***(Biji et al., 2017).***

AIM OF THE WORK

The current study aims to investigate the prevalence of asymptomatic bacteriuria, its major determinants and its effect on kidney functions in SCD for early detection & treatment.