

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

قال تعالى :

(وَالَّذِينَ إِذَا فَعَلُوا فَاحِشَةً أَوْ ظَلَمُوا أَنْفُسَهُمْ ذَكَرُوا اللَّهَ
فَاسْتَغْفَرُوا لِذُنُوبِهِمْ وَمَنْ يَغْفِرُ الذُّنُوبَ إِلَّا اللَّهُ وَلَمْ
يُصِرُّوا عَلَى مَا فَعَلُوا وَهُمْ يَعْلَمُونَ (135) أُولَئِكَ جَزَاءُهُمْ
مَغْفِرَةٌ مِنْ رَبِّهِمْ وَجَنَّاتٌ تَجْرِي مِنْ تَحْتِهَا الْأَنْهَارُ
خَالِدِينَ فِيهَا وَنِعْمَ أَجْرُ الْعَامِلِينَ (136))

صدق الله العظيم

سورة آل عمران

الآية (135- 136)

DEDICATION

To My

PARENTS

TEACHERS

BROTHERS AND

SISTERS

FRIENDS

COLLEAGUES

ACKNOWLEDGMENTS

Firstly, thank to Almighty ALLAH who gave me health and
.power to do this study

I would like to express my sincere thanks and gratitude to
my supervisor **Dr. Yousif Fadlalla HamedElnil** whose
stimulating suggestion, help, knowledge, experience and
.encouragement helped me in all times of study

I would like to say thank you to my beloved parents who
have been the source of encouragement and teach me to
.fulfill my dreams

A special thanks to my Fiancé **Mohammed Bushra
Abed El Mahmoud** for his vital encouragement, support,
.and valuable advices

I would like also to thank my friends and colleague
Hoyam Badradeen Hamid Alhosain for her close
.assistance in this work

My appreciation to all members and staff of the College of
Medical Laboratory Science, SUST, for help ,cooperation
.and encouragement

I would like to acknowledge and extend my heartfull
gratitude to all human for their participation and
.cooperation

Finally, very special thanks to my colleagues for their
.unlimited support throughout this study

ABSTRACT

This study was conducted during the period from April to August 2013 to determine the seroprevalence of human cytomegalovirus (HCMV) among renal transplant recipients . at East Nile Model Hospital

A total of 120 patients were included in this study. One hundred (n=100) subjects were renal transplant recipients attending the clinics of East Nile Model Hospital for clinics care, the remaining twenty (n=20) subject were apparently healthy, non of the renal transplant recipients with no history of renal transplant included as control group. The ages of all .the patients ranged from 20-60 years

Personal and clinical data were collected by questionnaire after a verbal consent, serum samples were collected, tested for CMV IgG and IgM using enzyme-linked immunosorbent .(assay (ELISA

Out of the 100 renal transplant recipients tested 90\100 (90%) and out of control group tested 19\20 (95%) were positive for CMV IgG. While Out of the 100 renal transplant recipients tested only 2\100 (2%) and out of the control group tested 1\20(5%) were positive for CMV IgM. The age, and distribution among male and female were significantly associated ($p < 0.05$) with CMV IgG\IgM seropositivity. While the educational level were not significantly ($p > 0.05$) .associated with CMV infection

The results revealed that the IgG and IgM of HCMV increased with ages. Also the results showed that the incidence of CMV .((IgG, IgM) was significantly increased in males ($P < 0.05$

ملخص الأطروحة

أجريت هذه الدراسة لتحديد الانتشار المصلي لفيروس مضخم الخلايا بين متلقي الكلي بمستشفى شرق النيل النموذجي. شملت الدراسة مائة وعشرون شخص (120). (100) منهم كانوا أشخاص يأتون لعيادات مستشفى شرق النيل النموذجي للرعاية الطبية وباقي العدد عشرون (20) كانوا أشخاص سليمين ظاهرياً لم يجري لهم عملية نقل كلي من قبل أدرجوا في الدراسة كمجموعة ضابطة للاختبار. أعمار كل الأشخاص الذين اختبروا كانت تتراوح ما بين 20 إلى 60 سنة.

تم جمع المعلومات الشخصية والطبية عن طريق الاستبيان بعد موافقتهم الشفوية ومن ثم أخذت العينات وفحصت لمعرفة احتوائها علي أجسام مضادة من النمط IgG والنمط IgM لفيروس مضخم الخلايا باستخدام اختبار الإليزا.

من مجموع 100 من متلقي الكلي 90\100 (90%) و 19\20 (95%) من مجموعة الأشخاص الضابطين للاختبار غير متلقي الكلي كانت لديهم أجسام مضادة من النمط IgG، بينما من مجموع 100 من متلقي الكلي 2\100 (2%) و 1\20 (5%) من مجموعة الأشخاص الضابطين للاختبار غير متلقي الكلي كانت لديهم أجسام مضادة من النمط IgM لفيروس مضخم الخلايا.

كانت هنالك علاقة ذات دلالة إحصائية (القيمة الاحتمالية اقل من 0.05) بين كل نوع وعمر متلقي الكلي من جهة ومعدل ايجابية الأجسام المضادة من النمط المضادة من النمط IgM لفيروس مضخم الخلايا من الجهة الأخرى.

وجد في هذه الدراسة أن المستوى التعليمي ليست لها علاقة ذات دلالة إحصائية (القيمة الاحتمالية اكبر من 0.05) بالإصابة بفيروس مضخم الخلايا.

TABLE OF CONTENTS

.NO	Subjects	.Page No
	الآية	i
	Dedication	ii
	Acknowledgments	iii
	Abstract, English	iv
	Abstract, Arabic	v
	Tables of Contents	vi
	List of Tables	ix
	Abbreviations	x
CHAPTER ONE: INTRODUCTION		
1.1	Background	1
1.2	Rationale	2
1.3	Objectives	2
1.3.1	General objective	2
1.3.2	Specific objectives	3
CHAPTER TWO: LITERATURE REVIEW		
2.1	Introduction	4
2.2	History	4
2.3	Classification	5

2.4	Structure of virus	5
2.5	Properties of CMV	7
2.6	Replication of CMV	8
2.7	Transmission	8
2.8	Epidemiology	9
2.9	Pathogenesis	10
2.10	Pathogenicity	10
2.10.1	Infection in immunocompetent	10
2.10.2	Infection in immunocompromised patients	11
2.10.3	Infection in pregnant women	11
2.10.4	Congenital and neonatal infection	12
2.10.5	Infection in renal recipient	12
2.11	Immunity	13
2.12	Laboratory diagnosis	15
2.12.1	Collection of specimens	16
2.12.2	Cell culture	16
2.12.3	Shell vial assay	17
2.12.4	Cytopathology	17

2.12.5	Serology	19
2.12.6	Polymerase chain reaction	20
2.13	Treatment	20
2.14	Prevention and control	21

CHAPTER THREE: MATERIALS AND METHODS

3.1	Study design	23
3.2	Study area and population	23
3.3	Study duration	23
3.4	Patient groups	23
3.5	Sample collection	23
3.6	Sampling technique	24
3.7	Data collection	24
3.8	Ethical consideration	24
3.9	Laboratory work	24
3.9.1	ELISA for detection of CMV IgM antibodies	24
3.9.1.1	Procedure	24
3.9.1.2	Calculation of control values and cut-off	25
3.9.1.3	Interpretation of the results	26
3.9.2	ELISA for detection of CMV IgM antibodies	26
3.9.2.1	Procedure	26

.3.9.2		
2.	Calculation of control values and cut-off	26
3.9.2.		
3	Interpretation of the results	27
.3		
9.2.4	Data analysis	27
CHAPTER FOUR: RESULTS		
4.1	Detection of CMV IgG positive subjects among the renal transplant recipients and the control group	28
.4.2	Detection of CMV IgM positive subjects among the renal transplant recipients and control group	28
.4.3	The effect of age on CMV IgG and IgM prevalence	29
.4.4	The effect of sex on CMV IgG and IgM prevalence	30
CHAPTER FIVE: DISCUSSION		
5.1	Discussion	32
5.2	Conclusion	33
5.3	Recommendations	33
	References	35
	Appendices	41

LIST OF TABLES

Table .no	Legend	.Page no
4.1	Detection of CMV IgG positive subjects among the	28

	renal transplant recipients and the control group	
.4.2	Detection of CMV IgM positive patients among the renal transplant recipients and control group	29
4.3	The effect of age on prevalence of CMV IgG	29
4.3	The effect of age on prevalence of CMV IgM	30
4.4	The effect of sex on prevalence of CMV IgG	30
4.4	The effect of sex on prevalence of CMV IgM	31

ABBREVIATIONS

AIDS	Acquired immunodeficiency syndrome
CMV	Cytomegalovirus
CID	Cytomegalic Inclusion Disease
COV	Cut-off value
CPE	Cytopathic effect
EPV	Epstein-Barr virus
EIA	Enzyme Immunoassay
ELISA	Enzyme-Linked Immunosorbent Assay
HAART	Highly active antiretroviral therapy
HCMV	Human cytomegalovirus
HFFF	Human fetal foreskin fibroblast
HHV-5	Human herpesvirus 5
HHV-6	Human herpesvirus 6
HHV-7	Human herpesvirus 7

HIV	Human immunodeficiency virus
HSV	Herpes simplex virus
PCR	Polymerase chain reaction
pp65	Phosphoprotein 65
RF	Rheumatoid factor
SET	Stem cell transplantation
SOT	Solid-organ transplantation
	SLE Systemic Lupus Erythematous
SPSS	Statistical Package of Social Sciences
TLRs	Toll-like receptors
TMB	Tetramethylbenzidine