DETECTION OF REACTIVATION OF CYTOMEGALOVIRUS IN RENAL TRANSPLANT RECIPIENTS

Thesis

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سُورَةُ البَقَرَةِ
بِسْمِ اللَّهِ الرَّحْمَٰنِ الرَّحِيمِ
قَالُوا
سُبْحَانَكَ لَا عِلْمَ لَنَا إِلَّا مَا عَلَّمْتَنَا ۖ
إِنَّكَ أَنتَ الْعَلِيمُ الْحَكِيمُ
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Abstract

Background: Cytomegalovirus infection in renal transplant recipients is a major clinical problem that may cause significant morbidity and mortality. Infection can occur as a result of reactivation of latent virus or new infection from donor tissues.

Objectives: To assess the incidence of cytomegalovirus (CMV) reactivation, and to determine the predictive factors for CMV reactivation in renal-transplant patients also to compare CMV-DNA amplification using qRT-PCR with serologic assays of CMV-IgM antibodies to detect CMV reactivation.

Study design: Sixty patients were included in this study. They were classified into 3 groups based on the post transplantation period during which the study was performed. ELISA was used to detect the pre-transplantation CMV serostatus for the donor and the recipient as well as the recipient post transplantation CMV serology. CMV DNAemia was assessed by qRT-PCR first on whole blood (WB). Whenever a positive result was obtained; the assay was then performed on plasma to detect the difference between them.

Results: CMV reactivation occurred in two patients following the treatment of their rejection episode and was detected by qRT-PCR using whole blood and not in plasma.

Conclusion: *Cytomegalovirus* reactivation was not high in the studied patients, which may be due to the presence of pre -existing immunity in the form of neutralizing antibody, and that treatment of an episode of acute allograft rejection was the most important risk for CMV reactivation within the first year post-transplantation. qRT-PCR is an important tool in predicting subsequent or ongoing disease, while detection of anti CMV-IgM antibodies is not sensitive enough for diagnosis

Keywords: *Cytomegalovirus*, Kidney Transplantation, Reactivation, Acute rejection, Immunosuppressive therapy.

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List Of Abbreviations

Ab	Antibody
ADCC	Antibody-dependent cell-mediated cytotoxicity
Ag	Antigen
AIDS	Acquired immune deficiency syndrome
ALG	Antilymphocytic globulin
ALL	Acute lymphoblastic leukemia
AP	Assembly protein
BKV	BK virus
BMT	Bone marrow transplantation
CARI	Caring for Australians with Renal Impairment
CD	Clusters of differentiation
CDV	Cidofovir
CMV	Cytomegalovirus
CNS	Central nervous system
CP	crossing point
CPE	Cytopathic effect
CsA	Cyclosporin A
C_T	Threshold cycle
CTL	Cytotoxic T-cell
CVS	Cardiovascular system
D/R	Donors/recipients

DB	Dense bodies
DM	Diabetes Mellitus
DMSO	Dimethyle sulfoxide
DNA	Deoxyribonucleic Acid
dNTP	desoxynucleoside triphosphate
dTTP	desoxythimidine triphosphate
dUTP	desoxyuridine triphosphate
EBV	Epstein-Barr virus
EDTA	Ethylene-diamine-tetraacetic acid
EHV1	Equine Herpesvirus
ELISA	Enzyme-linked immunosorbent assay
ER	Endoplasmic reticulum
ESRD	End stage renal disease
FRET	Fluorescence resonance energy transfer
gB gene	Glycoprotein B gene
GC	Guanine & Cytosine
GCV	Gancyclovir
H&E	Hematoxylin and eosin, a standard tissue stain
H_2O	Water
H_2O_2	Hydrogen peroxide
H_2SO_4	Sulpheric acid
HAART	Highly active anti-retroviral therapy
HBV	Hepatitis B Virus
HCMV	Human cytomegalovirus

HCV	Hepatitis C Virus
HD	Hemodialysis
HHV	Human herpesvirus
HHV-8	Human herpesvirus 8
HIV	Human Immunodeficiency Virus
HLA	Human leukocyte antigen
Hr	Hour
HRPO	Horse radish peroxidase
HSCT	Haematopoietic stem cell transplant
HSV	Herpes Simplex Virus
HVS	Herpesvirus Saimiri
IE genes	Immediate early genes
IF	Immunofluorescence
IgA	Immunoglobulin A
IgG	Immunoglobulin G
IgM	Immunoglobulin M
IHMF	The International Herpes Management Forum.
INF(-α)	Interferons -α
IU	International unit
Kbp.	Kilo base pair
KS	Kaposi's sarcoma
L genes	Late genes
Lab	Laboratory
LED	Light emitting diode

MGPs	Magnetic glass particles
MHC	Major histocompatibility complex
MIE gene	Major immediate-early gene
ml	Milliliter
MMF	Mycophenolate mofetil
mmol/L	Millimols per litre
NK cells	Natural killer cells
Nº	Number
^{o}c	Degree Celsius
OKT3	Orthoclone
PBLs	Peripheral blood leukocytes
PBMCs	Peripheral blood mononuclear cells
PCR	Polymerase chain reaction
PD	Peritoneal dialysis
PFA	Pyrophosphate analogue
pp	Phosphoprotein
PRV	Pseudorabies virus
PVAN	Polyomavirus-associated nephropathy
Qn PCR	quantitative PCR
RBC	Red blood cells
RNA	Ribonucleic acid
RPR	Rapid plasma regain
RT- PCR	Real-time polymerase chain reaction
RTR	Renal transplant recipients

SCT	Stem cell transplant
SE	Standard error of the mean
SOT	Solid organ transplant
SPSS	Statistical Product and Service Solutions (formerly Statistical Package for Social Sciences).
TMB	Tetramethyl benzidine
TST	Tuberculin skin test
UL	Unique long
US	Unique short
UTI	Urinary tract infection
vICA	Viral inhibitor of caspase-8 induced apoptosis
vMIA	Viral mitochondrial inhibitor of apoptosis
WB	Whole blood
WBC	White Blood Cell, White Blood Cell Count
WHO	World Health Organisation
µg	Microgram

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INTRODUCTION & AIM OF WORK

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