STUDY ON SEROPREVALENCE OF IgM ANTIBODIES AGAINST THE AGENTS OF TORCH INFECTIONS AMONG THE PATIENTS VISITING NATIONAL PUBLIC HEALTH LABORATORY

A
DISSERTATION
SUBMITTED TO THE CENTRAL DEPARTMENT OF MICROBIOLOGY
TRIBHUVAN UNIVERSITY

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF THE DEGREE OF MASTER OF SCIENCE IN MICROBIOLOGY (MEDICAL)

BY
SUJATA LAMICHHANE

CENTRAL DEPARTMENT OF MICROBIOLOGY
TRIBHUVAN UNIVERSITY
KIRTIPUR, KATHMANDU, NEPAL
2007

-SUJATA LAMICHHANE 2007

RECOMMENDATION

This is to certify that **Miss SUJATA LAMICHHANE** has completed this dissertation work entitled **"Study on seroprevalence of IgM antibodies against the agents of TORCH infections among the patients visiting National Public Health Laboratory"** as a partial fulfillment of Master of Science Degree in Microbiology under our supervision. To our knowledge, this work has not been submitted for any other degree.

Ms. Shaila Basnyat
Assistant Professor
Central Department of Microbiology
Tribhuvan University
Kirtipur, Kathmandu

Prof. Dr. Sarala Malla, M.D.
Director General
Department of Health Services
Ministry of Health and Population and
Coordinator
M. D. Pathology Subject Committee
NAMS, Bir Hospital

Date: ……

CERTIFICATE OF APPROVAL

On the recommendation of **Ms. Shaila Basnyat and Prof. Dr. Sarala Malla,** this dissertation work of **Miss Sujata Lamichhane,** entitled **"Study on seroprevalence of IgM antibodies against the agents of TORCH infections among the patients visiting National Public Health Laboratory"** has been approved for the examination and is submitted to the Tribhuvan University in the Partial fulfillment of the requirements for **Master of Science Degree in Microbiology (Medical).**

_____

Dr. Anjana Singh
Head of Department
Central Department of Microbiology
Tribhuvan University
Kirtipur, Kathmandu
Nepal

Date: **……**

BOARD OF EXAMINERS

Recommended by:

Ms. Shaila Basnyat
Supervisor

Prof. Dr. Sarala Malla
Supervisor

Approved by:

Dr. Anjana Singh
Head of Department

Examined by:

Bishnu Tiwari
Microbiologist
Nepal Red Cross Society
Central Blood Transfusion Service
External Examiner

Binod Lekhak
Assistant Professor
Central Department of Microbiology
Tribhuvan University
Internal Examiner

Date: **……**

ACKNOWLEDGEMENT

First of all, I would like to express my sincere gratitude and heartfelt appreciation to my respected supervisor **Prof. Dr. Sarala Malla, Director General, Department of Health Services** for her constant inspiration, superb guidance and great support during this research work.

I would equally like to express my earnest gratitude and heartfelt appreciation to my supervisor, **Ms. Shaila Basynat, Assistant Professor, Central Department of Microbiology, Tribhuvan University** for her constant encouragement, remarkable guidance and incredible support in the completion of this research.

I am much obliged to honorable **Dr. Anjana Singh, Head of Department, Central Department of Microbiology, Dr. Prakash Ghimire** and all the teachers and staffs of Central Department of Microbiology, Tribhuvan University, all of whom have been very inspiring and supportive.

I am indebted to **Mr. Shyam Khanal** for his constant encouragement and overwhelming support during the whole laboratory work at NPHL. I am immensely grateful to **Mr. Shyam Prakash Dumre** for his help in the preparation of this thesis. I am also thankful to **Mr. Laxman Maharjan, Mr. Bir Bdr. Poudel, Mr. Omkar Shrestha, Mr. Ramji Sapkota, Mr. Purna Kumar Shrestha** and all the staffs of NPHL for their help and cooperation throughout the laboratory work.

I would like to acknowledge my friends **Padma Shrestha, Rojita Tuladhar, Kamil Prajapati and Khagendra K.C.** for their supportive contributions during this research work. I am equally thankful to my brothers **Sujan Lamichhane** and **Subhash Lamichhane** for their help during computer settings.

Finally, I am greatly obliged to **my parents** without whose constant inspiration and unconditional support, this work would not have been completed.

_____

Date: **……** Sujata Lamichhane

ABSTRACT

A study was conducted among patients suspected of TORCH (*Toxoplasma gondii*, Rubella virus, Cytomegalovirus and Herpes simplex virus) infections visiting National Public Health Laboratory (NPHL), Kathmandu, Nepal. The study was conducted at the Immunology section of NPHL for five months from May-September 2006. The main aim of this study was to determine the seroprevalence of TORCH infections among the suspected patients of different age groups and gender and to correlate this data with different disease conditions.

Serum samples collected from 276 patients were tested for TORCH infections by IgM Enzyme Linked Immunosorbent Assay (ELISA). Only 23.19% (64/276) of the samples showed presence of IgM antibodies against TORCH agents. Higher seroprevalence of TORCH (IgM) was found in females (26.32%) than in males (16.28%). However, the association of TORCH infection with the gender was not found to be statistically significant ($P>0.05$).

Among 219 suspected cases of *Toxoplasma*, 4.88% (2/41) of male and 15.73% (28/178) of female patients were positive to anti-*Toxoplasma* IgM. Similarly, 9.37% (3/32) of the male and 3.73% (6/161) of the female patients among 193 suspected cases were positive to anti-Rubella IgM, 14.70% (5/34) of the male and 11.04% (18/163) of the female patients among 197 suspected cases were positive to anti-CMV IgM and 9.46% (7/74) of the male and 11.90% (20/168) of the female patients among 242 suspected cases were positive to anti-HSV IgM. An overall prevalence of 13.70%, 4.66%, 11.67% and 11.16% to *T. gondii*, Rubella virus, CMV and HSV respectively was found.

An overall prevalence of IgM antibodies were found to be 15.43% (25/162), 4% (6/150), 9.33% (14/150) and 11.49% (17/148) to *Toxoplasma*, Rubella, CMV and HSV respectively among 164 female patients with bad obstetric history (BOH).

Associations of *Toxoplasma* infection with meat eating habit and rearing cats were found to be statistically significant ($p<0.05$).

Key words: TORCH infection, serum, IgM, ELISA, Female with BOH

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF PHOTOGRAPHS

LIST OF APPENDICES

LIST OF ABBREVIATIONS

µl	:	Microlitre
AIDS	:	Acquired Immune Deficiency Syndrome
BOH	:	Bad Obstetric History
CAR	:	Congenitally Acquired Rubella
CDC	:	Centre for Disease Control and Prevention
CMI	:	Cell Mediated Immunity
CMV	:	Cytomegalovirus
CNS	:	Central Nervous System
CRS	:	Congenital Rubella Syndrome
CSF	:	Cerebro Spinal Fluid
CT	:	Computed Tomography
DNA	:	Deoxyribo Nucleic Acid
EEGs	:	Electroencephalograms
EIA	:	Enzyme Immuno Assay
ELISA	:	Enzyme Linked Immunosorbent Assay
HBsAg	:	Hepatitis B surface Antigen
HIV	:	Human Immuno Deficiency virus
HSV	:	Herpes Simplex Virus
IF	:	Immuno Fluorescence
IFAT	:	Indirect Fluorescent Antibody Technique
Ig	:	Immunoglobulin
IgA	:	Immunoglobulin A
IgG	:	Immunoglobulin G
IgM	:	Immunoglobulin M
IU	:	International Unit
LP	:	Lumbar Puncture
MMR	:	Mumps Measles Rubella
MRI	:	Magnetic Resonance Imaging

NHANES : National Health and Nutrition Examination Surveys

NPHL : National Public Health Laboratory

PCR : Polymerase Chain Reaction

RNA : Ribo Nucleic Acid

RSA : Recurrent Spontaneous Abortions

RT-PCR : Reverse Transcriptase-Polymerase Chain Reaction

STI : Sexually Transmitted Infections

TORCH : *Toxoplasma*, Rubella, Cytomegalovirus and Herpes Simplex Virus

TSL-PAMF: *Toxoplasma* Serology Laboratory-Palo Alto Medical Foundation

UK : United Kingdom

US : United States

VDRL : Venereal Disease Research Laboratory

VZV : Varicella Zooster Virus