SCREENING OF HIV AMONG THE BLOOD DONORS AND DELIVERY CASES VISITING MATERNITY WARD OF AMDA HOSPITAL OF DAMAK

A

Dissertation Submitted to the Central Department of Microbiology Tribhuvan University

In Partial Fulfillment for the award of the Degree of Master of Science in Microbiology (Medical)

> By Dinesh Dhungana

Central Department of Microbiology Tribhuvan University Kirtipur, Kathmandu, Nepal 2009

RECOMMENDATION

This is to certify that **Mr. Dinesh Dhungana** has completed this dissertation work entitled "**Screening of HIV among the Blood Donors and Delivery Cases visiting Maternity ward of AMDA Hospital of Damak**" as a partial fulfillment of M.Sc. Degree in Microbiology under our supervision. To the best of our knowledge, this work has not been submitted for any other degree.

Prof. Dr. Shreekant Adhikari, Ph.D. Central Department of Microbiology Tribhuvan University Kirtipur, Kathmandu

Mr. Bishnu Raj Tiwari

Quality Control Officer/Microbiologist Nepal Red Cross Society, Central Blood Transfusion Service, Kathmandu

Date:

CERTIFICATE OF APPROVAL

On the recommendation of **Prof. Dr. Shreekant Adhikari** and **Mr. Bishnu Raj Tiwari** this dissertation work of Mr. **Dinesh Dhungana** entitled "Screening of HIV among the Blood Donors and Delivery Cases visiting Maternity ward of AMDA Hospital of Damak" is approved for the examination and is submitted to Tribhuvan University in partial fulfillment of the requirements for M.Sc. Degree in Microbiology (Medical).

Date: _____

Dr. Dwij Raj Bhatta, Ph.D. Head of the Department, Central Department of Microbiology, Tribhuvan University, Kirtipur, Kathmandu Nepal

.

BOARD OF EXAMINERS

Recommended by:

Prof. Dr. Shreekant Adhikari, Ph.D. Supervisor

Mr. Bishnu Raj Tiwari, M.Sc Supervisor

Approved by:

Dr. Dwij Raj Bhatta, Ph.D. Head of the Department

Examined by:

Prof. Dr. N R Tuladhar External Examiner

Mr. Komal Raj Rijal Lecturer Internal Examiner

Date:

ACKNOWLEDGEMENT

I would like to express my cordial gratitude to my respected supervisors Professor Dr. Shreekant Adhikari, Central Department of Microbiology, Tribhuvan University, Mr. Bishnu Raj Tiwari, Quality Control Officer, Nepal Red Cross Society, Central Blood Transfusion Service, Kathmandu for their full support and expert guidance during this dissertation.

I am especially grateful to Associate Professor Dr. Dwij Raj Bhatta, Head of the Central Department of Microbiology for his help and support.

I would like to express my deep sincere gratitude to my respected supervisor Mr. Bishnu Raj Tiwari, for his constant inspiration and valuable suggestions during the entire period of my dissertation work.

I am very much thankful to Mr. Amrit Pandey, Lab In charge of AMDA hospital Damak and Mr. Nirajan K.C for providing the laboratory facility.

I am grateful to Mr. Ramesh Bhattrai, Miss Uma Shrestha and Tanka Prasad Dahal for their cooperation during the laboratory work.

I am also thankful to all the teachers and staffs of Central Department of Microbiology and to all my colleagues especially to my brother Mr. Bikash Basnet for their valuable suggestions and helping hands to complete my research work.

Finally, I would like to express my deepest gratitude to my family especially my mother for their blessings, and encouragement for the successful completion of this work.

Date: _____

Dinesh Dhungana

ABSTRACT

The study was a descriptive cross sectional study conducted in Nepal Red Cross Society Blood transfusion service and AMDA hospital situated in Damak, Jhapa over a period of five month from July 2008 to November 2008 with the objective to find the HIV seroprevalence among the blood donors and pregnant/delivery women.

A total of 2005 sera samples, 795 of the blood donors and 1210 delivery case were tested for HIV antibodies using the EIA based rapid test kits HIV TRI-DOT, Determine HIV 1/2 and Capillus HIV 1/2.

The overall seroprevalence of anti HIV antibodies was observed to be 0.10% i.e. (2/2005). Higher seroprevalence was observed among the blood donors 0.13% (1/795) with 100% seropositivity in male donors than among the delivery cases 0.08% (1/1210) (P>0.05). Interestingly in both cases prevalence was found only in the age group 21-30 years which is considered as sexually active age with overall seroprevalence of 0.17% (P>0.05). This is in contrast with all the other findings around the world.

Though current study does not show any sign of alarming condition of HIV infection it indicates the silent presence of HIV among the general low risk group people of the society.

Key words: HIV, Seroprevalence, Blood donors, delivery cases

LIST OF CONTENTS

	Page No.
Title page	i
Recommendation	ii
Certificate of Approval	iii
Board of Examiners	iv
Acknowledgement	V
Abstract	vi
List of Contents	vii
List of Figures	xi
List of Tables	xii
List of Abbreviations	xiv
List of Photographs	xvi
List of Annexes	xvii
CHAPTER I: INTRODUCTION	1
CHAPTER II: OBJECTIVES	5
2.1 General Objective	5
2.2 Specific Objectives	5
CHAPTER III: LITERATURE REVIEW	6
3.1 Human Immunodeficiency Virus	6
3.1.1 Discovery and Origin of HIV	6
3.1.2 Classification, HIV groups and subtypes	7
3.1.3 General Properties of HIV	8
3.2 Replication	9
3.3 Bio-safety, Disinfection and Inactivation	10
3.4 Epidemiology	

3.4.1 Global prevalence	12	
3.4.2 HIV/AIDS in Nepal	14	
3.5 Risk factors and Transmission of HIV	17	
3.6 Multiple infection	21	
3.7 Pathogenesis and Clinical features	21	
3.8 Laboratory diagnosis of HIV Infection	24	
3.9 Treatment		
3.10 Prevention		
CHAPTER IV: MATERIALS AND METHODS	33	
4.1 Materials	33	
4.1.1 Equipments	33	
4.1.2. Test kits	33	
4.1.3 Glass wares and others	33	
4.2 Methodology	34	
4.2.1 Study site and study period	34	
4.2.2 Study population	34	
4.3 Collection of Blood sample	34	
4.3.1 Separation of serum /plasma	35	
4.4 Laboratory testing		
4.4.1 Detection of anti HIV-1 and 2 antibodies	35	
by HIV TRI-DOT Test Kit		
4.4.2 Detection of anti HIV-1 and 2 antibodies	35	
by Determine Test Kit		
4.4.3 Detection of anti HIV-1 and 2 antibodies	35	
by Capillus Test Kit		
4.5 Statistical analysis	35	
4.6 Diagnostic strategy		
4.6. 1 HIV testing strategy	36	

CHAPTER V: RESULTS	37	
5.1 Pattern of Study Population		
5.2 Seroprevalence of HIV among the Blood Donor		
5.3 Age and Sex Specific Seroprevalence of HIV among Blood Donors	40	
5.4 HIV Seroprevalence among Volunteer and Replacement Blood Donors	41	
5.5 Seroprevalence of HIV among Delivery Cases	41	
5.6 Age Specific Seroprevalence of HIV among Delivery Cases	42	
5.7 Comparative HIV Seroprevalence among Blood Donors and	43	
Delivery Cases		
5.8 Age Specific Comparison of HIV Seroprevalence among	43	
Blood Donors and Delivery Cases		
CHAPTER VI: DISCUSSION AND CONCLUSION	45	
6.1 Discussion	45	
6.2 Conclusion	50	
CHAPTER VII: SUMMARY AND RECOMMENDATION	51	
7.1 Summary	51	
7.2 Recommendation	52	
REFERENCE	53	

ANNEXES

LIST OF FIGURES

Figure 3.1: HIV-1 Virion and genomic organization of HIV-1	8
Figure 5.1.1: Type of Donation and Gender Wise Distribution of Blood Donors	38
Figure 5.1.2: Age and Sex Wise Distribution of Blood Donors	39
Figure 5.1.3: Month and Age Wise Distribution of Delivery Cases	39

LIST OF TABLES

Table 5.2: Seroprevalence of HIV among the Blood Donors	40
Table 5.3: Distribution of HIV Seropositive among Blood Donors	40
according to Age Groups	
Table 5.4: Distribution of HIV Seropositive Males and Females	41
according to Type of Donation	
Table 5.5: Seroprevalence of HIV among Delivery Cases	42
Table 5.6: Distribution of HIV Seropositive Delivery Case	42
according to Age Group	
Table 5.7: Seroprevalenc of HIV among the Blood Donors and Delivery Cases	43
Table 5.8: Distribution of HIV Seropositive Blood Donors and Delivery Cases	44
according to Age Group	

LIST OF ABBEREVIATIONS

AIDS:	Acquired Immuno Deficiency Syndrome
AMDA:	Association of Medical Doctors of Asia
ART:	Antiretroviral Therapy
CSW:	Commercial sex workers
CDC:	Centers for Disease Control and Prevention
NRCS,SCD:	Nepal Red Cross Society Sub Chapter Damak
ELISA:	Enzyme linked Immunosorbent Assay
EIA:	Enzyme Immunoassay
FSW:	Female Sex Workers
FHI:	Family Health International
UNAIDS:	United Nation Acquired Immuno Deficiency Syndrome
HIV-1:	Human Immuno Deficiency Virus type-1
HIV-2:	Human Immuno Deficiency Virustype-2
HTLV:	Human T-cell Lymphotropic Virus
HAART:	Highly active antiretroviral therapy
IBBS:	Integrated Bio-Behavioral Surveillance Study
IDUs:	Intravenous Drug Users
LAV:	Lymphadenopathy-associated virus
MSM:	Men having Sex with men
MTCT:	Mother to Child Transmission
NCASC:	National Center for AIDS and STD control
PCR:	Polymerase Chain Reaction
RT:	Reverse Transcriptase
RNA:	Ribo nucliec Acid
SPARSHA:	Society for Atmosphere and Related Support to HIV and AIDS
STD:	Sexually Transmitted Disease
UNAIDS:	United Nations Programme on HIV/AIDS
WHO:	World Health Organization

LIST OF PHOTOGRAPHS

- Photograph 1: HIV TRI-DOT kit showing positive result for Anti HIV-1 and 2 Antibodies test
- Photograph 2: Determine and Capillus kit showing positive result for Anti HIV-1 and 2 Antibodies test

LIST OF ANNEXES

ANNEX-I	Blood Donors form (used as questionnaire)
ANNEX-II	Literature of HIV TRI-DOT test kit
ANNEX-III	Literature of Determine HIV1/2 test kit
ANNEX-IV	Literature of Capillus HIV1/2 test kit