SERO-EPIDEMIOLOGY OF MEASLES AND RUBELLA IN NEPAL

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 MEDICAL MICROBIOLOGY

BY
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2010

RECOMMENDATION

This is to certify that **Mr. Bimal Paudel** has completed this dissertation work entitled **"Sero-epidemiology of Measles and Rubella in Nepal"** 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.

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CERTIFICATE OF APPROVAL

On the recommendation of **Dr. Dwij Raj Bhatta and Dr. Mukunda Sharma,** this dissertation work of **Mr. Bimal Paudel,** entitled **"Sero-epidemiology of Measles and Rubella in Nepal"** 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).**

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ABSTRACT

Background: Measles and Rubella are endemic in Nepal with Measles causing greatest morbidity and mortality in children among all vaccine preventable diseases and increasing no. of Rubella cases posing greater public health challenge of congenital defects.

Methods: This study was designed to estimate sero-prevalence of Measles and Rubella in Nepalese population based at NPHL, with WHO-IPD. During the period of March 2009 to February 2010, a total of 1009 specimens from suspected Measles/Rubella cases were tested for anti-Measles IgM and anti-Rubella IgM.

Results: Out of 1009 suspected cases, 53.5% were male and 46.5% were female. Of the total suspected cases tested by ELISA technique, 1.8% cases were Measles positive whereas 49.7% cases were Rubella positive. Among confirmed Measles positive 55.6% cases were from male and 44.4% cases were from female similarly 50.5% cases were male and 49.5% were female among all confirmed Rubella positive. Highest no. of Measles positive cases were from age group 5-15 years (44.4%) followed age group 1-5 years (38.9%), below 1 year (11.1%) and 15-45 years (5.6%). Collectively 94.4% Measles positive cases were from age group up to 15 years and rest 5.6% from above 15 years. Similarly Highest no. of Rubella positive cases were also from age group 5-15 years (60.7%) followed by 1-5 years (28.3%), below 1 year (4.2%), 15-45 years (3.2%) and above 45 years (0.2%). Collectively 96.6% Rubella positive cases were from age group up to 15 years and rest 3.4% from above 15 years. Measles positive cases were clustered in summer season (61.1%) with highest in July (44.4%). Most of the Rubella positive cases were observed in summer season (47.1%) followed by spring season (44.9%) with highest no. in June (113, 22.6%). Among 60 districts, Measles positive cases were observed only from 11 districts while Rubella positive cases were observed from 43 districts. The highest no. of Measles positive cases were confirmed in Kathmandu district (27.8%) followed by Doti (22.2%). The highest no. of Rubella positive cases were observed in Mahottari district (15.6%) followed by Dang (14.2%), Kathmandu (11.4%), Bhaktapur (6.4%) Dhankuta (5.2%) and Gorkha (3.6%). These six districts accounted 56.3% of total Rubella positive cases. Measles positive cases were equal from CDR and FWDR 6(33.3% each). Highest no. of Rubella positive cases were from CDR (46.1%) followed by EDR(22.4%), MWDR(16%), WDR(9%) and FWDR(5%). Majority of Measles and Rubella positive cases were from Hill and Terai region. Higher sero-positivity rate (7.6%) for measles was observed in patients who were unvaccinated compared to vaccinated (1.2%).

Conclusion: The actual Measles and Rubella burden can be estimated by strengthening and expanding the diagnostic facilities in the country. Further strengthening the vaccination strategies for measles along with need to introduce Rubella containing vaccine in immunization program should be emphasized.

Key words: Measles, Rubella, serum, epidemiology, vaccination

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LIST OF ABBREVIATIONS

A	Adenine
C	Cytosine
CDC	Centre for Disease Control and Prevention
CDR	Central Development Region
CMI	Cell Mediated Immunity
CF	Complement Fixation
CFR	Case Fatality Rate
COV	Cut-off Value
CPE	Cytopathic Effect
CRS	Congenital Rubella Syndrome
CSF	Cerebro Spinal Fluid
DNA	Deoxyribo Nucleic Acid
DoHS	Department of health Service
EDR	Eastern Development Region
EIA	Enzyme Immuno Assay
ELISA	Enzyme Linked Immunosorbent Assay
EPI	Expanded Programme on Immunization
FWDR	Far-western Development Region
G	Guanine
HI	Haemagglutination inhibition
Ig	Immunoglobulin
IgA	Immunoglobulin A
IgD	Immunoglobulin D
IgE	Immunoglobulin E
IgG	Immunoglobulin G
IgM	Immunoglobulin M
IPD	Immunization Preventable disease
MHC	Major Histocompatibility Complex
MMR	Mumps Measles Rubella
MNC	Mean Negative Control

MPC	Mean Positive Control
MR	Measles Rubella
MV	Measles Virus
MWDR	Mid-western Development Region
NA	Not Available
NDV	Newcastle Disease Virus
NIP	National Immunization Programme
NPHL	National Public Health Laboratory
OD	Optical Density
ORF	Open Reading Frame
PCR	Polymerase Chain Reaction
PHA	Passive Hemagglutination
QNS	Quality not sufficient
RNA	Ribo Nucleic Acid
RT-PCR	Reverse Transcriptase-Polymerase Chain Reaction
SEAR	South East Asia Region
SIA	supplemental immunization activity
SLAM	Signaling Lymphocyte Activation Module
SMO	Surveillance Medical Officer
SSPE	Subacute Sclerosing Panencephalitis
U	Uracil
UK	United Kingdom
USA	United States of America
UV	Ultra Violet
WDR	Western Development Region
WHO	World Health Organization
WPR	West Pacific Region

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