# SEROEPIDEMIOLOGICAL STUDY OF DENGUE VIRUS INFECTION IN PARSA DISTRICT OF NEPAL

**A DissertationSubmitted to the Department of Microbiology**

**Kantipur College of Medical Science**

**(*Affiliated to Tribhuvan University*)**

**In Partial Fulfillment of the Requirements for the Award of Degree of Master of Science in Microbiology**

**(Medical)**

**By**

**SHRAWAN KUMAR SINGH**

**Department of Microbiology**

**Kantipur College of Medical Sciences**

**Sitapaila, Kathmandu, Nepal**

**TU Registration No: 5-2-33-592-2007**

**Exam Roll No: 18773**

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# RECOMMENDATION

This is to certify that **Mr. Shrawan Kumar Singh** has completed this dissertation work entitled **"Seroepidemiological study of dengue virus infection in Parsa district of Nepal** "as a partial fulfillment of the requirements of M.Sc. degree in Microbiology (Medical) under our supervision. To **our** knowledge this work has not been submitted for any other degree.

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|---|---|---|
| ..... | ..... | ..... |
| **Dr. Basu Dev Pandey** | **Mr. Nabaraj Adhikari** | **Mr. Upendra Thapa Shrestha** |
| MD, Ph.D. | | |
| Supervisor | Supervisor | Supervisor |
| Director | Program Co-ordinator | Head of Department |
| Everest International Clinic | Kantipur College of | Kantipur College of |
| and Research Center | Medical Science | Medical Science |
| Kalanki, Kathmandu | Sitapaila, Kathmandu | Sitapaila, Kathmadu |

Date: ……..

# CERTIFICATE OF APPROVAL

On the recommendation of the supervisors **Dr. Basu Dev Pandey**, **Mr.Upendra Thapa Shrestha** and **Mr**. **Nabaraj Adhikari**, this dissertation work of **Mr**. **Shrawan Kumar Singh,** entitled **"Seroepidemiological study of dengue virus infection in Parsa district of Nepal"**has been approved for the examination and is submitted to Tribhuvan University in partial fulfillment of the requirement for M.Sc degree in Microbiology **(Medical).**

**……**

**Mr.Upendra Thapa Shrestha**

Head

Department of Microbiology

Kantipur College of Medical Sciences

(*Affiliated to Tribhuvan University*)

Sitapaila, Kathmandu, Nepal

Date: -……

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Supervisor

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**Mr. Nabaraj Adhikari**

Supervisor

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**Mr. Upendra Thapa Shrestha**

Head of Department

**Examined by:** ……

**Ms. Binita Nepal**

Lecturer

Kantipur College of Medical Science

Internal Examiner

……...

**Mr. Puspa Raj Dahal**

Teaching Assistant

Trichandra Multiple Campus

External Examiner

**Date:** ……

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Date: ……  Shrawan Kumar Singh

# ABSTRACT

Dengue fever (DF) is an emerging mosquito borne viral disease and important public health problem in low land of Terai region which is also expanding to hilly region of Nepal. The study aims to shed light on the clinical, epidemiological and serological aspects associated with dengue virus infections (DVI) and its implications in future diagnosis, management, prevention and control of the disease in Nepal. Two hundred sixty one serum samples were collected from patients suspected of dengue virus infection visiting hospitals of Parsa districts during July- December of 2013 and tested by IgM Capture Enzyme linked immunosorbent assay (Standard Diagnostic INC., Korea) and Dengue IgM/IgG Rapid immunochromatographic test kit(Panbio, Australia).The anti-dengue IgM positivity was found to be 18.8% and 15.3% by IgM capture Enzyme linked immunosorbent assay and Rapid immunochromatographic test respectively. Among 49 anti-dengue IgM positive cases, the highest numbers 40(15.3%) cases were observed in age group of 15-50 years. Student was the most commonly affected with the highest number of positive cases 16(6.2%). Patients with Joint pain, retro-orbital pain and Skin rash as clinical symptoms were more likely to be diagnosed as anti-dengue IgM positive. The highest numbers 41(20.6%) of cases have duration of fever more than 5 days among IgM positive cases. Knowledge of dengue was found in 20(11.6%) of anti-dengue IgM positive cases. Water logging 15(10.9%) and Travel to endemic area 10(37%) were found as the more likely risk factors in anti-dengue IgM positive cases. Flower pot was found as the most likely breeding place with the highest number of positive cases 19(36.5%).Use of net 87.3% and change stored water 85.8% was the most likely used preventive measures respectively. The diagnostic accuracy of RDT for the detection of IgM antibody is low. So it would be better to use ELISA test than RDT whenever possible.

***Keywords:*** **DVI, IgM Capture ELISA, RDT**

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# ABBREBRATION

| | |
|---|---|
| **ADE** | Antibody Dependent Enhancement |
| **APCs** | Antigen Presenting Cells |
| **Den(1-4)** | Dengue (1-4) |
| **DF** | Dengue fever |
| **DHF** | Dengue Hemorrhagic fever |
| **DSS** | Dengue Shock Syndrome |
| **DV** | Dengue Virus |
| **DVI** | Dengue Virus infection |
| **EC** | Endothelial Cells |
| **EDCD** | Epidemiology and Disease Control Division |
| **EICRC** | Everest International Clinic and Research Centre |
| **ELISA** | Enzyme linked Immuno Sorbent Assay |
| **HLA** | Human Leukocyte Antigen |
| **HRP** | Horse reddish peroxidase |
| **IL** | Interleukin |
| **JE** | Japanese Encephilitis |
| **MAB** | Monoclonal Antibody |
| **NHRC** | Nepal Health Research Council |
| **PAHO** | Pan American Health Organization |
| **PCR** | Polymerase chain Reaction |
| **RDT** | Rapid Diagnostic Test |
| **RNA** | Ribonucleic Acid |
| **RT-PCR** | Reverse Transcriptase PCR |
| **SEARO** | South East Asian Region |
| **TAE** | Tris-acetate EDTA |
| **TMB** | Tetramethylbenzidine |
| **WHO** | World Health Organization |