ANTIBIOGRAM OF *SALMONELLA* SEROVARS FROM THE BLOOD OF CLINICALLY SUSPECTED ENTERIC FEVER PATIENTS VISITING ALKA HOSPITAL

A

DISSERTATION SUBMITTED TO THE
CENTRAL DEPARTMENT OF MICROBIOLOGY

TRIBHUVAN UNIVERSITY

KIRTIPUR, KATHMANDU, NEPAL

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR
THE AWARD OF DEGREE OF
MASTER OF SCIENCE IN MICROBIOLOGY
(Environment and Public Health)

BY

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RECOMMENDATION

This is to certify that **Mr. Hari Jung Chand** has completed this dissertation work entitled **"ANTIBIOGRAM OF *SALMONELLA* SEROVARS FROM THE BLOOD OF CLINICALLY SUSPECTED ENTERIC FEVER PATIENTS VISITING ALKA HOSPITAL"** as a partial fulfillment of the requirements of M. Sc. degree in Microbiology (Environment and Public Health) under our supervision. To our knowledge, this work has not been submitted for any other degree.

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ABSTRACT

Enteric fever is endemic in Nepal having a significant public health burden and includes typhoid fever caused by *Salmonella* serotype Typhi and paratyphoid fever caused by *Salmonella* serotypes Paratyphi A, B, and C. A cross sectional study was carried out in clinically suspected enteric fever patients visiting Alka Hospital during July 2011 to February 2012 to determine the prevalence of enteric fever and antibiogram pattern of *Salmonella* isolates.

Out of 1202 blood samples collected, only 86 (7.2%) showed positive blood culture result among which 56 (65.1%) isolates were *Salmonella* Typhi and 30 (34.9%) isolates were *Salmonella* Paratyphi A. Prevalence of enteric fever was higher in female patients (40/542; 7.4%) than in male patients (46/660; 7.0%), in age group 11-21 years (28/220; 12.7%), and in the months of July and August. *Salmonella* Typhi isolates were 100% sensitive to chloramphenicol, cotrimoxazole, cefixime, ceftriaxone, ciprofloxacin and gentamicin followed by 98.2% sensitive to amoxycillin, ofloxacin and 89.3% sensitive to azithromycin. Similarly *Salmonella* Paratyphi A isolates were 100% sensitive to amoxycillin, cotrimoxazole, ceftriaxone and gentamicin followed by 96.7% sensitive to chloramphenicol, ciprofloxacin, ofloxacin, cefixime and 86.7% sensitive to azithromycin. None of the *Salmonella* isolates were multi drug resistant (MDR). About 91.1% *S.* Typhi and 90.0% *S.* Paratyphi A isolates were nalidixic acid resistant (NAR). None of the nalidixic acid resistant *S.* Typhi were ciprofloxacin resistant whereas 1 (3.7%) nalidixic acid resistant *S.* Paratyphi A isolate was resistant to ciprofloxacin. This study revealed the increasing frequency of nalidixic acid resistant *Salmonella* isolates and re-emergence of susceptibility to conventional first line drugs.

Keywords: Enteric fever, Multi drug resistant (MDR), Nalidixic acid resistant, *Salmonella*

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF PHOTOGRAPHS

LIST OF APPENDICES

LIST OF ABBREVIATIONS

AIDS	Acquired Immune Deficiency Syndrome
ASM	American Society of Microbiology
ATCC	American Type Culture Collection
BA	Blood Agar
CDC	Centre for Disease Control
CLSI	Clinical and Laboratory Standards Institute
DOHS	Department of Health Services
ESBL	Extended Spectrum Beta Lactamase
HIV	Human Immunodeficiency Virus
MA	MacConkey Agar
MIC	Minimum Inhibitory Concentration
MDR	Multi Drug Resistant
MDRST	Multi Drug Resistant *Salmonella* Typhi
MHA	Mueller Hinton Agar
MIC	Minimum Inhibitory Concentration
MR	Methyl Red
NA	Nutrient Agar
NB	Nutrient Broth
NAR	Nalidixic Acid Resistant
NARST	Nalidixic acid resistant *Salmonella* Typhi
NPHL	National Public Health Laboratory
QRDR	Quinolones Resistant-Determining Chromosomal Region
SIM	Sulphide Indole Motility
SPIs	Salmonella pathogenicity islands
SPS	Sodium Polyanethol Sulphonate
SPSS	Statistical Package for Social Science
TMP-SMX	Trimethoprim-sulfamethoxazole
TPD	Tetramethyl *p*-phenylene diamine dihydrochloride
TSI	Triple Sugar Iron Agar
TUTH	Tribhuvan University Teaching Hospital
VP	Voges-Proskauer
WHO	World Health Organization