

Contents

LIST OF CONTENTS

CHAPTER NO.	CONTENTS	PAGE NO.
	LIST OF TABLES	
	LIST OF FIGURES	
	LIST OF PLATES	
	LIST OF APPENDICES	
I	INTRODUCTION	1
II	REVIEW OF LITERATURE	
	A. Definition, types and prevalence of NTDs	10
	B. Risk factors of NTDs	19
	C. Complications of NTDs	26
	D. Diagnostic tests for NTDs	28
	E. Folic acid in the prevention of NTDs and related studies	31
III	METHODOLOGY	
	Phase 1 Assessment of prevalence of NTDs in Erode Town	39
	Phase 2 Survey on the possible influence of maternal factors on NTDs and the problems faced by the pregnant mothers of NTD cases	42
	Phase 3 Counseling women aspiring for pregnancy to prevent occurrence of NTDs and	43
	Phase 4 Evaluation of the efficacy of periconceptional supplementation of folate alone as well as in combination with multivitamin or iron in preventing the recurrence of NTDs	53

CHAPTER NO.	CONTENTS	PAGE NO.
IV	RESULTS AND DISCUSSION	
	A. Prevalence of NTDs in Erode town	63
	B. Possible influence of maternal factors on NTDs and the problems faced by the pregnant mothers of NTD cases	93
	C. Impact of counseling women to prevent occurrence of NTDs and	110
	D. Evaluation of the efficacy of periconceptual supplementation of folate alone as well as in combination with multivitamin or iron in preventing the recurrence of NTDs	132
V	SUMMARY AND CONCLUSION	177
	BIBLIOGRAPHY	
	APPENDICES	
	PUBLICATIONS	

LIST OF TABLES

TABLE NO.	TITLE	PAGE NO.
I	Environmental exposures associated with increased risk of NTDs	22
II	Year wise incidence of NTDs at selected hospitals of Erode town	64
III	Total number and incidence rates of reported NTDs in Erode town during 2000-2004	66
IV	Total number and incidence rates of reported NTDs by gender in Erode town during 2000-2004	69
V	Total number and incidence rates of reported NTDs by maternal age in Erode town during 2000-2004	72
VI	Total number and incidence rates of reported NTDs by maternal literacy in Erode town during 2000-2004	76
VII	Total number and incidence rates of reported NTDs by parity in Erode town during 2000-2004	78
VIII	Total number and incidence rates of reported NTDs by weeks of gestation in Erode town during 2000-2004	81
IX	Total number and incidence rates of reported NTDs by birth weights in Erode town during 2000-2004	84
X	Total number and incidence rates of reported NTDs by type of delivery in Erode town during 2000-2004	87
XI	Total number and incidence rates of reported NTDs registered in Erode town during 2000-2004	90
XII	Incidence Rates of NTDs – A Comparison (2000-2004)	91

TABLE NO.	TITLE	PAGE NO.
XIII	Maternal age and prevalence of NTDs	93
XIV	Age at marriage and prevalence of NTDs	94
XV	Type of family and incidence of NTDs	95
XVI	Family size and incidence of NTDs	96
XVII	Monthly family income and type of NTDs	97
XVIII	Educational status and type of NTDs	98
XIX	Consanguinity and type of NTDs	99
XX	Parity and type of NTDs	100
XXI	Birth spacing and type of NTDs	101
XXII	Time of identification and type of NTDs	102
XXIII	Physiological problems faced by women during NTD affected pregnancy	103
XXIV	Psychological problems faced by women during NTD affected pregnancy	104
XXV	Time of intake of supplements by women during NTD affected pregnancy	105
XXVI	Type of supplements taken during NTD affected pregnancy	106
XXVII	Mode of delivery of the NTD affected infants	107
XXVIII	Weeks of gestation at the time of delivery of NTD affected infants	107
XXIX	Medical expenses incurred during NTD affected pregnancy	108

TABLE NO.	TITLE	PAGE NO.
XXX	Survival of the NTD affected infants	109
XXXI	Socio economic profile of the selected women	111
XXXII	Type of diet consumed	112
XXXIII	Food consumption pattern of folic acid rich foods by the selected women	113
XXXIV	Medicinal supplements taken during periconceptual period	117
XXXV	Mean food intake of the selected women	118
XXXVI	Mean nutrient intake of the selected women	121
XXXVII	Mean anthropometric measurements of the selected women	123
XXXVIII	BMI of the selected women	124
XXXIX	Clinical status of the selected women	125
XL	Mean haemoglobin levels of the selected women	126
XLI	Mean serum folate levels of the selected women	128
XLII	Correlation coefficient values between specific nutrient intakes and biochemical levels	130
XLIII	Nutritional knowledge scores of the selected women	131
XLIV	Demographic details of the experimental groups	133
XLV	Consanguinity among the experimental groups	134
XLVI	Information regarding NTD affected pregnancy	135

TABLE NO.	TITLE	PAGE NO.
XLVII	Type of NTDs prevalent in the experimental groups	137
XLVIII	Period of survival of the NTD affected infants in the experimental groups	139
XLIX	Physiological problems faced by the experimental groups with NTDs	140
L	Psychological problems faced by the experimental groups with NTDs	141
LI	Time of identification and termination of NTD affected pregnancy by the experimental groups	142
LII	Time and type of supplements taken by the experimental groups	143
LIII	Outcome and cost of pregnancy among the experimental groups	144
LIV	Sex of the NTD affected infants of the experimental groups	145
LV	Mean biometrics of the NTD affected foetuses of the experimental groups	146
LVI	Mean food intake of the experimental groups	149
LVII	Mean nutrient intake of the experimental groups	152
LVIII	Mean weight gain among the experimental groups	155
LIX	BMI grades of the experimental groups	156
LX	Knowledge scores of the experimental groups before and after counseling	157
LXI	Mean serum folate levels of the experimental groups before and after supplementation	158
LXII	Impact of supplementation on mean serum folate levels among the experimental groups- A comparison	160

TABLE NO.	TITLE	PAGE NO.
LXIII	Correlation coefficient values between total folate intake and serum folate levels among the experimental groups	161
LXIV	Mean haemoglobin levels of the experimental groups before and after supplementation	162
LXV	Impact of supplementation on mean haemoglobin levels among the experimental groups- A comparison	164
LXVI	Correlation coefficient values between iron intake and haemoglobin levels among the experimental groups	165
LXVII	Factor analysis in Group A	167
LXVIII	Factor analysis in Group B	169
LXIX	Factor analysis in Group C	171
LXX	Mean foetal biometrics of the experimental groups	172
LXXI	Pregnancy outcome	173
LXXII	Mean anthropometric measurements of the new borns	175

LIST OF FIGURES

FIGURE NO.	TITLE	PAGE NO.
1	NTD and its types	12
2	Outline of the study	62
3	Incidence rates of reported NTDs in Erode town during 2000-2004	67
4	Incidence rates of reported NTDs by gender in Erode town during 2000-2004	70
5	Incidence rates of reported NTDs by maternal age in Erode town during 2000-2004	73
6	Incidence rates of reported NTDs by maternal literacy in Erode town during 2000-2004	76
7	Incidence rates of reported NTDs by parity in Erode town during 2000-2004	79
8	Incidence rates of reported NTDs by weeks of gestation in Erode town during 2000-2004	82
9	Incidence rates of reported NTDs by birth weights in Erode town during 2000-2004	85
10	Incidence rates of reported NTDs by type of delivery in Erode town during 2000-2004	88
11	Food intake of the selected women before and after counseling	119
12	Nutrient intake of the selected women before and after counseling	122
13	Impact of counseling on the hemoglobin levels of the selected women	127
14	Haemoglobin levels of the selected women based on WHO classification	127

FIGURE NO.	TITLE	PAGE NO.
15	Impact of counseling on the serum folate levels of the selected women	129
16	Serum folate levels of the selected women	129
17	Mean food intake of the experimental groups before and after counseling	150
18	Mean nutrient intake of the experimental groups before and after counseling	153
19	Impact of folate supplementation on serum folate levels of experimental groups	159
20	Impact of folate supplementation on haemoglobin levels of experimental groups	163

LIST OF PLATES

PLATE NO.	TITLE	PAGE NO.
1	Features of neural tube development and NTDs	13
2	Development of teaching aids with health professionals	48
3	Folders exhibited in hospital notice board for the public	48
4	Developed teaching aids	49
5	Counseling sessions using posters	52
6	Counseling mothers with a previous NTD affected pregnancy	52
7	Folic acid supplements	55
8	Ultra scanning and anthropometric measurements of the newborn	60
9	Type of NTDs	138

LIST OF APPENDICES

APPENDIX NO.	TITLE
I	NTD cases reported in the hospitals in Erode town during 2000-2004
II	Interview schedule for NTD affected pregnancies during 2003-2004
III	Interview schedule for women aspiring for pregnancy
IV	Procedure for estimation of haemoglobin and serum folate
V	Clinical examination schedule
VI	Copy of the developed teaching aids
VII	Questionnaire for assessing nutritional knowledge
VIII	Interview schedule for the experimental groups
IX	Individual mean food intake of the selected women before and after counseling
X	Individual mean nutrient intake of the selected women before and after counseling
XI	Individual height, weight and BMI of the selected women
XII	Individual serum folate and haemoglobin levels of the selected women before and after counseling
XIII	Individual knowledge scores of the selected women before and after counseling
XIV a,b,c	Individual mean food intake of Groups A, B and C before and after counseling
XV a,b,c	Individual mean nutrient intake of Groups A, B and C before and after counseling
XVI	Individual anthropometric measurements of the experimental groups

APPENDIX NO.	TITLE
XVII	Individual knowledge scores of the experimental groups before and after counseling
XVIII	Individual haemoglobin and serum folate levels of the experimental groups before and after counseling
XIX	Individual foetal biometrics at 22 nd week of pregnancy
XX	Individual anthropometric measurements of the newborns