Annual Report

2009-10



Regional Medical Research Centre for Tribals
(Indian Council of Medical Research)
Jabalpur

All rights reserved. No part of this report should be copied or reproduced in any form without the written permission of the Director, RMRCT (ICMR) Jabalpur

PREFACE

It gives me immense pleasure to present the Annual Report of the centre for the year 2009-10. This year centre has moved forward with some new but promising projects. During the period the centre has strengthened its ties with state government and tribal welfare department with new initiatives. Dignitaries from the State Government visited the centre on several occasions.

In the event of swine flu pandemic alert, centre promptly responded by establishing a testing facility for H1N1P for quick diagnosis and in this direction it works in close co-ordination with state health authorities. Till date the centre has tested more than 500 suspected samples from various districts of Madhya Pradesh State. The work on malaria, tuberculosis, haemoglobinopathies and nutrition are also being carried out with vigor. This year we have also initiated some projects on socio-behavioural aspects of health and diseases.

In view of the emerging and reemerging infectious diseases we endeavour to capacity building by training our staff on biosafety.

As always scientists of the centre have participated in national and international conferences and presented their work. The quantity and quality of publications has greatly advanced. Apart from research, the centre also contributes considerably in academics. Now the centre is equipped with a trainee hostel for residential accommodation for the students involved in various research activities, trainings and workshops.

Centre regularly provides services through its various clinics and testing centre. Workshops and trainings were organized from time to time on fluorosis, malaria and HIV/AIDS for dissemination of knowledge and capacity building. Extracurricular activities like vigilance week, Hindi fortnight (Pakhwada) were observed by the centre. The foundation day of the centre on 1st of March was also celebrated with zeal and enthusiasm.

Finally, I would like to take this opportunity to acknowledge the unstinting support of Lt. General D. Raghunath, SAC chairman and other SAC members. I also wish to thank Dr.V.M.Katoch, Secretary to the Govt. of India, Department of Health Research, Ministry of Health and Family Welfare and Director General, ICMR for his constant encouragement and support to the centre.

Neeru Singh
Director

CONTENTS

Genetic Disorders	1
Vector Borne Diseases	10
Communicable Diseases	34
Community Health	40
Social and Behavioural Studies	48
Translational Research Outcomes	59
Regular Activities	60
Publications of Research Papers	65
Conference/ Workshop/ Meeting attended	67
Events	70
Appendices	73

1. GENETIC DISORDERS

1.1 Protection Provided by Haemoglobinopathies in Uncomplicated and Severe *Plasmodium Falciparum* Malaria

Date of Starting	:	February 2009
Duration	:	2 Years
Status	:	Ongoing
PI	:	Dr. R. B. Gupta
Funding	:	ICMR Tribal Sub-Plan

Malaria is a major health problem in India particularly in the tribal predominant areas of Central India. Most of the mortality and complications in malaria are often due to *Plasmodium falciparum*. In addition, populations of Central India, especially tribes, also suffer from red cell disorders like sickle haemoglobin, α-thalassaemia type II, β-thalassaemia and G-6-PD deficiency. These genetic disorders provide some protection or advantageous selection against *P. falciparum* malaria. Hence a prospective study is undertaken to observe the protection imparted by these red cell disorders. Present study is the first of its kind in India.

Objective

To observe the protective effect of common haemoglobinopathies (sickle haemoglobin, α-thalassaemia, β -thalassaemia trait etc.) in terms of malarial episodes and parasitemia, and Duffy antigens in mild (*P. falciparum*) and severe malaria (cerebral malaria).

Methodology

Baiga dominated 11 villages of the Baigachak area of the Dindori district were selected and household census was carried out. All these villages had high transmission of malaria with a predominance of *P. falciparum* malaria in the preceding three years (Fig 1.1.1).

Fig. 1.1.1: Map of the study area (Dots represent the study villages)



The participants were motivated to give intravenous blood sample for the genetic study. About 1 ml of blood sample was collected in EDTA vial after obtaining written informed consent. Blood samples were analysed for G-6-PD deficiency. In addition, qualitative and quantitative analysis for abnormal haemoglobin (HbS), haemoglobin A_2 (HbA_2) and foetal haemoglobin (HbF) was performed using cation exchange HPLC (Bio-Rad Variant II). DNA was extracted from buffy coat with DNA extraction kits as per manufacturer's instructions (Fermantas). α-thalassaemia type II was identified by allele specific amplification of those samples that yielded a ratio of 1.8 or above of ODs at 206 nm & 280 nm.

Findings

Malaria: During cross sectional active fever surveys, a total of 2,208 blood slides were collected from individuals having fever or history of fever during August 2009 to March 2010. A total of 1,127 persons were positive for malaria parasite (SPR 49.7). Proportion of *P. falciparum* infection was 82.1% (Table 1.1.1). The highest SPR was observed in the month of December 2009 (65.5%). Overall malaria infection was significantly higher (25.3%) among younger age groups (<14 yrs) than in adults (9.7%) of age group of 14+ years ($p< 0.001$).

Red cell disorders: A total of 396 persons were examined for red cell genetic disorders. Of these 12.3% (49) were detected to carry sickle cell trait (HbAS), while 3% (12) persons tested positive for β-thalassaemia, 2.8% (11) were G-6-PD deficient and 3.5% (14) for raised HbF. However, only 288 samples were analysed for α-thalassaemia type II. Only 20% of population demonstrated the presence of all four alpha genes and 48% of the population carried two gene deletions. Deletion-$\alpha^{3.7}$ allele occurred more often than -$\alpha^{4.2}$ allele.

Red cell disorders and malaria: Table 1.1.2 shows the probability of malarial infection and type of malarial infection in individuals with red cell genetic abnormalities. It was observed that none of the genetic variants showed any significant deviation in the form of *P. falciparum* or *P. vivax* infection from the normal individuals. These observations are based on small sample size and the study is ongoing. In contrast, in β-thalassaemia carriers the proportion of *P. falciparum* infection was marginally higher but statistically insignificant. In the remaining categories the proportion of *P. vivax* infection was higher.

Table 1.1.1: Prevalence of malaria in study villages (August 2009-March 2010)

Months	BSE	SPR	Pv	Pf	Mix	Pf %	SFR
August	174	36.7 (64)	8	56		87.5	32.1
September	619	47.6(295)	24	270	1	91.5	43.6
October	441	56.0(247)	35	211	1	85.4	47.8
November	478	57.7(276)	50	226		81.9	47.2
December	145	65.5(95)	32	63		66.3	43.4
January-2010	168	51.1(86)	26	59	1	68.6	35.1
February	127	39.3(50)	19	31		62.0	24.4
March	56	25.0(14)	4	10		71.4	17.8
Total	2208	49.7(1127)	198	926	3	82.1	40.8

Table 1.1.2: Malaria *vs* red cell genetic abnormalities

Red cell abnormality		% Malarial infected person		
		Pf	Pv	Total
Sickle status (N)	Normal (HbAA, 347)	50.4	7.5	57.9
	Sickle cell trait (HbAS)	53.1	12.2	65.3
G6PD status (N)	Normal (385)	50.9	7.8	58.7
	G6PD deficient (11)	45.5	18.2	63.6
HbF status (N)	Normal (382)	51.0	7.6	58.6
	Raised (14)	42.9	21.4	64.3
β-thal status (N)	Normal (384)	50.3	8.3	58.6
	β-thal trait (12)	67.7	0.0	66.7
α-thal status (N)	Normal (αα/αα, 61)	47.5	3.3	52.5
	α-thal trait (αα/-α, 103)	49.5	11.6	61.2
	α- thal homozygous (-α/-α, 150)	44.7	7.3	52.5

Table 1.1.3: Red cell abnormalities vs parasitaemia count in *P. falciparum* malaria

STATUS	Type	N	MEAN (±SD)
Sickle Hb	HbAA	157	3591.3 (5. 17)
	HbAS	24	3358.7 (5.22)
G6PD	N	175	3584.7 (5.17)
	DEF	5	2777.8 (5.31)
β-thal	N	175	3537.8 (5.17)
	β-thal trait	6	4913.6 (5.21)
α-Thal type II	αα/αα	25	5561.6 (5.46)
	αα/-α	49	3073.7 (5.26)
	-α/-α	62	3555.5 (5.16)

Red cell abnormalities vs parasitaemia count in *P. falciparum* malaria: The mean and standard deviation of parasitaemia were computed by converting the parasite count value to log base 10. Protection against *P. falciparum* was observed for all red cell markers studied, except β-thalassaemia trait. Persons with *P. falciparum* infection demonstrated significantly lower parasitaemia count ($p<0.0001$) as compared to normal individuals (Table 1.1.3). Notably in case of *P. vivax* infection, the number of observations in abnormal groups was low hence the results are not presented in the table. Furthermore, *P. vivax* infection is not considered as lethal and is not stated to have selected against any of the studied genetic variants.

1.2. Morbidity Profile of Sickle Cell Disease in Central India

Date of Starting	:	January 2002
Status	:	Ongoing
PI	:	Dr. R. B. Gupta
Funding	:	Intramural

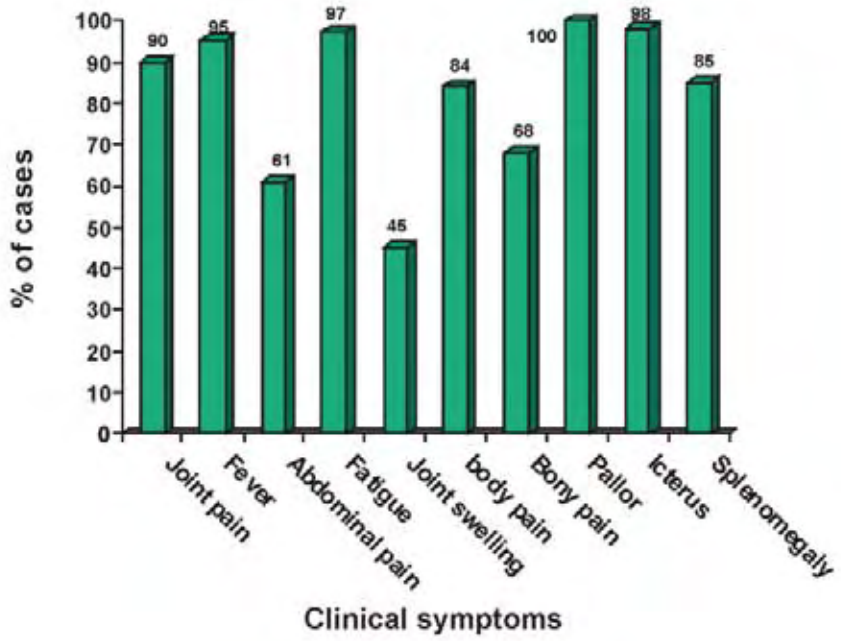
Sickle cell disease (SCD) is a single gene disorder that gives rise to variable phenotypic expression due to interaction of various genetic and environmental factors. In India, the disease is predominantly reported from the tribal belts of Central and Southern India. The sickle cell gene disorder in India has originated independently and is distinctly different from those originated elseware. The clinical profile of the disease and the various compounding factors influencing the disease profile are not yet known.

Findings

In the sickle cell clinic, a total of 62 patients were registered from April 2009 to March 2010. Although the disease is common among the tribes of the area, only few of them seek tertiary level medical aid. Further, the disease is caused by autosomal recessive gene mutation. Notably males constitute about 70% of the total registered patients indicating wide prevalence of gender bias in seeking the tertiary level hospital facilities. About 65% patients are of age less than 15 years. About 45% of patients were from Scheduled castes communities and 34% of patients were from OBCs. Figure 1.2.1 shows sympotomatic presentations observed among all registered patients. As can be seen from the figure, about 90% patients presented with joint/bony pain, 95% with fever, 61% with abdominal pain, 45% with joint swelling and 85% with splenomegaly at the time of registration. Icterus was observed in nearly 98% of the patients.

Minor intervention in the form of folic acid supplementation and quick treatment for common ailments such as fever, bony/joint pain, cold & cough, along with some precautions to avoid crises precipitating factors reduced the severity of SCD. This simple intervention has resulted in reduced severity of the disease.

Fig. 1.2.1: Common signs and symptoms observed in SCD Patients (N=62)





Patient of splenomegaly

1.3. Reproductive Outcome in Carrier Couples of Haemoglobinopathies: A Retrospective Study

Date of Starting	:	March 2010
Duration	:	Three Years
Status	:	Ongoing
PI	:	Dr. R.S. Balgir
Funding	:	Intramural

The sickle cell haemoglobinopathy and β-thalassemia are major genetic and public health problems in Central India. A great deal of literature is available regarding the clinical and hematological aspects of these disorders, but the details regarding the reproductive outcome in affected couples are scanty in India.

In view of the 2nd highest infant mortality rate (IMR) reported in the state of Madhya Pradesh (70 per thousand live-births in 2009) in comparison to other states and whole of India (58) compounded with the high prevalence of haemoglobin disorders, it is presumed that the haemoglobinopathies might be one of the significant contributing factors for IMR in the carrier couples of haemoglobinopathies towards the infant/neonatal mortality in Madhya Pradesh.

Objectives

To find the reproductive outcome retrospectively in terms of abortion, stillbirth, neonatal deaths and infant mortality in carrier couples of haemoglobinopathies.

To observe the trends of haemoglobinopathies (in surviving offspring) in terms of increase or decrease (any deviation from ratio: AA: 2AS: SS = 1:2:1) in offspring of these couples, applying Hardy-Weinberg law.

Findings

Out of 17 couples screened with suspected haemoglobinopathies during March 2010, 9 were normal and 8 couples had haemoglobinopathies. Initial trends showed less number of surviving offspring in couples with haemoglobinopathies than in the normal control couples. The affected surviving offspring was higher in carrier couples with homozygous sickle cell disease and so was the mortality count in comparison of normal control couples (Table 1.3.1).

All the affected families referred were imparted genetic/marriage counseling before giving the investigation reports. The work is in progress.

Table1.3.1: Reproductive history profile of couples with suspected haemoglobinopathies

Diagnosis	No. of couples	No. of conceptions	Abortion	Still birth	Neo natal Deaths •	<1 yr deaths ■	<10 yrs deaths	Surviving children						
								Total	HbAA		Hb AS		HbSS	
									M	F	M	F	M	F
Normal Control	9	17	1	2	1	0	0	13	5*	8*	0	0	0	0
Sickle Cell Trait	4	9	0	0	1	0	1	7	1	1	0	0	3	2
HbAA-HbAS	2	5	1	0	0	0	0	4	4	0	0	0	0	0
HbAS-HbSS	2	5	0	0	1	0	1	3	0	0	0	2	0	1
β-thalassemia	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Haemoglobinopathies (Combined)	8	19	1	0	2	0	2	14	5	1	0	2	3	3

*Each has a twin • Birth to 28 days. ■ Birth to 365 days or within 1 year. HbAA-HbAS= Normal-Sickle Cell Trait. HbAS-HbSS= Sickle Cell Trait-Sickle Cell Disease.

2. VECTOR BORNE DISEASES

2.1. Epidemic Investigation of Malaria in Central India

Date of starting	:	August 2009
Duration	:	5 Months
Status	:	Completed
PI	:	Dr. Neeru Singh
Funding	:	Intramural

An investigation on epidemic of malaria among ethnic group 'Baigas' of Dindori and Balaghat districts of Madhya Pradesh was done on the request of Tribal Welfare Department, Government of Madhya Pradesh.

Objective

To explore the causes of malaria epidemic among the Baigas.

A. Dindori district

Methodology

Door to door rapid fever surveys were carried out in 44 out of 52 Baiga villages of 3 CHCs between August to December 2009 in the Dindori district (Fig. 2.1.1). Vector incrimination was done by ELISA. Spleen was examined by Hacket method.

Findings

Age and species specific data on malaria for the study areas are shown in Table 2.1.1. Both *P. vivax* and *P. falciparum* are prevalent in all age groups with preponderance of *P. falciparum*. Slide positivity rate (SPR) was lowest in adults (age above 14 years) when compared with other age groups ($P<0.0001$). Highest SPR was recorded in children (1 to 4 years) and a similar trend was observed in distribution of *P. falciparum* cases ($P<0.0001$). Gametocytes of *P. falciparum* were present in blood smears of 14, 14.3, 12, 11.5 and 6.4% of subjects in age groups ≤1, >1-4, >4-8, >8-14 and above 14 years of respectively. Significantly low prevalence of gametocytes was recorded amongst the adults when compared with other age groups except in infants ($P<0.05$). The lowest prevalence of *P.*

vivax was observed in adults while age group 1 to 4 years showed highest prevalence (P<0.0001).

Fig. 2.1.1:Map of India (A) showing Madhya Pradesh (B) and Dindori district. Samnapur, Bajag and Karanjia CHCs (C) showing study villages

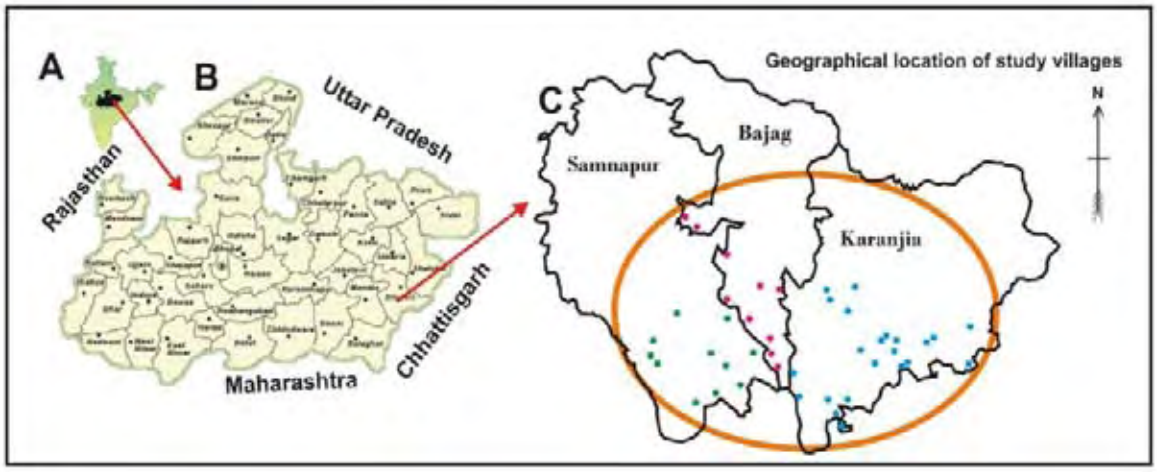
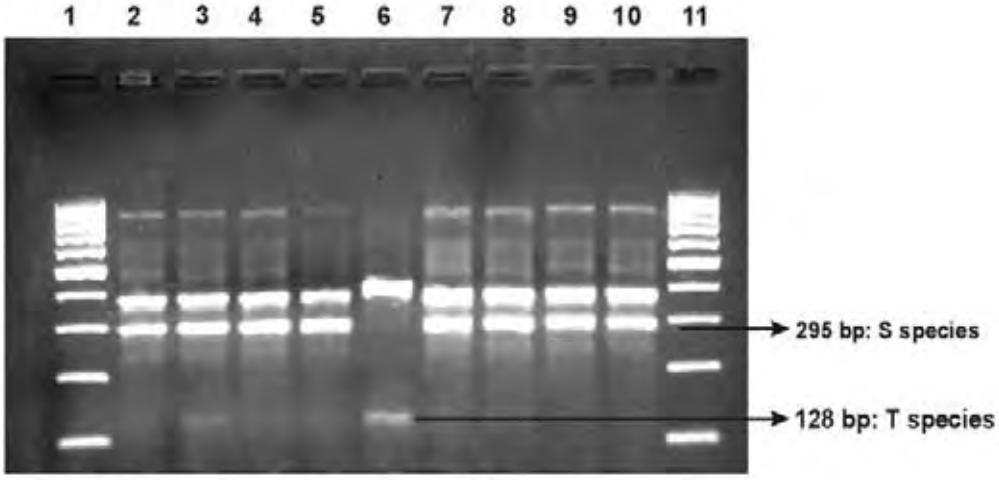


Table 2.1.1 : Age group wise epidemiological data of Baigachak, district Dindori Central India (Aug. - Dec., 2009)

Age Group (Years)	Malaria/ Fever	SPR (95% CI)	Pf	SFR (95% CI)	Pv	SVR (95% CI)
≤ 1	52/120	43.3 (34.8–52.3)	43/120	35.8 (27.8–44.7)	9	7.5 (3.5–13.8)
>1 – 4	280/497	56.3 (51.9–60.6)	223/497	44.9 (40.5–49.3)	56	11.3 (8.6–14.4)
> 4 – 8	328/748	43.8 (40.3–47.4)	288/748	38.5 (35.1–42.0)	39	5.2 (3.7–7.1)
> 8 – 14	278/720	38.6 (35.1–42.2)	251/720	34.9 (31.5–38.4)	26	3.6 (2.4–5.2)
> 14	490/1870	26.2 (24.3–28.2)	451/1870	24.1 (22.2–26.1)	39	2.1 (1.5–2.8)

A total of 539 *An. culicifacies* and 88 *An. fluviatilis* were collected by hand catch and pyrethrum spray catches. Out of these specimens, one *An. culicifacies* and two *An. fluviatilis* were tested positive for *P. falciparum* circumsporozoite antigen. Further analysis revealed that positive specimen of *An. culicifacies* collected from cattle shed represents sibling species C while the remaining two positive specimens of *An. fluviatilis* collected from human dwelling represent species S (Fig. 2.1.2).

Fig. 2.1.2 : Polymerase chain reaction assay for differentiation of members of *An.fluviatilis* complex



Lane 1 & 11 are 100 bp DNA ladder
Lane 2-10 show PCR amplified product of *An. fluviatilis* DNA

The presence of sporozoite positive *An. culicifacies* and *An. fluviatilis* indicates that either spray was not carried out properly or it was due to insecticide resistance. Evidence suggests non availability of Artemisinin based combination therapy (ACT), rapid diagnostic tests (RDTs) and immunogenically vulnerable population each played an important role. A combination of all these factors propagated the epidemic. Thus detection and control of epidemics acquires greater attention. Eventually, mechanisms to ensure quality of interventions become essential.

B. Balaghat district

Balaghat is one of the highly malarious district in MP. Situation analysis of malaria carried out in Balaghat district revealed that the worst affected villages were mainly those having ethnic group of Baiga primitive tribe in Birsa and Baihar Community Health Centres (CHCs) bordering Chhattisgarh state wherein villages are prone to Maoist violence. Here, State Vector Borne Disease Control Programme was using synthetic pyrethroid to spray dwellings. Further, Artemisinin based combination treatment (ACT) has now been made the first line treatment in these areas.

Methodology

Cross sectional fever surveys were carried out between May 2009 to February 2010 in 20 villages of Birsa and Baihar CHCs (Fig. 2.1.3). Vector incrimination was done by ELISA. Spleen examination was done in schools by Hacket method.

Findings

Point prevalence surveys revealed a very high prevalence of malaria in both infants (>25% with 64% Pf) as well as older children (>30% with >85% Pf) as compared to adults (>11% with 90% Pf). Children between 1-14 yrs have significantly more malaria due to *P. falciparum* as compared to other age groups ($p<0.00001$) (Table 2.1.2). Spleen rate among children (2-9 yrs) was 60% (166/275). Gametocyte rate was high in both the groups (>10%). *An. culicifacies* was incriminated as vector for both malarial parasites. One specimen of *An. culicifacies* was positive for *P. falciparum* circumsporozoite antigen and one for *P. vivax* circumsporozoite antigen.

Fig. 2.1.3: Map of MP (A) showing district Balaghat (B) and Birsa and Baihar CHCs

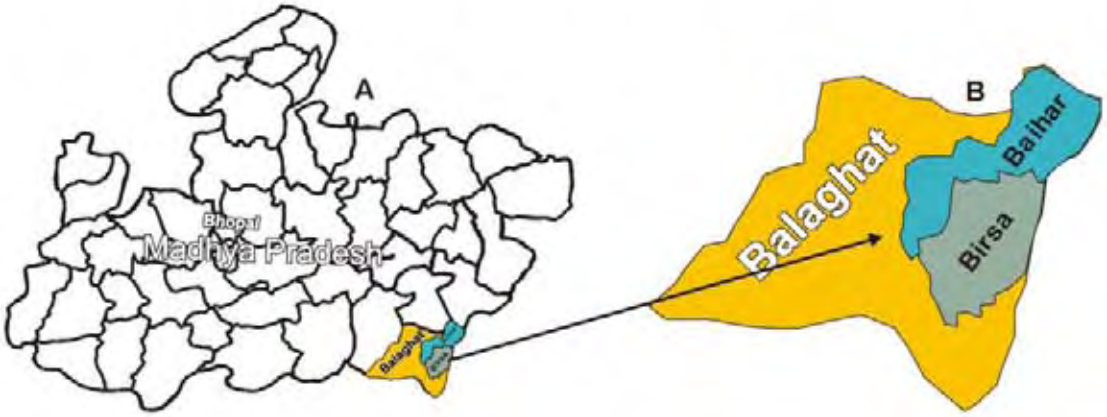


Table 2.1.2: Age group wise epidemiological data of Balaghat district, 2009-10

AGE GROUP	BSE	POS	Pf	Pv	SPR	SFR	Pf%
0-1	167	42	27	15	25.15	16.17	64.29
>1-4	563	171	140	31	30.37	24.87	81.87
>4-8	961	329	282	47	34.24	29.34	85.71
>8-14	662	216	200	16	32.63	30.21	92.59
>14	1083	121	110	11	11.17	10.16	90.91
Total	**3436**	**879**	**759**	**120**	**25.58**	**22.09**	**86.35**

2.2. Comparative Evaluation of Commercially available Rapid Diagnostic Tests (Malaria Pf/Pv Kit) vs. Traditional and Molecular Techniques for Malaria

Date of starting	:	August 2009
Duration	:	6 months
Status	:	Completed
PI	:	Dr. Neeru Singh
Funding	:	WR Country Office

Malaria presents a diagnostic challenge in forested and inaccessible areas. Several rapid diagnostic tests (RDTs) are available, which are fast, reliable and can detect *P. falciparum* and non falciparum infections or both. Five RDTs evaluated were selected on the basis of two main criteria, i.e. tests detecting both *P. falciparum* and non-falciparum infections and available commercially.

Objectives

To measure the overall performance of commercially available RDTs in comparison with traditional and molecular techniques for diagnosis of *P. falciparum* and non falciparum infections.

Methodology

This study was conducted in 10 villages of Bajag Primary Health Centre of district Dindori and 10 villages of Satanwada Primary Health Centre, District Shivpuri between August to December, 2009. Five commercially available RDTs were tested simultaneously in field in parallel with peripheral blood smears by microscopy and PCR. The 5 RDTs used in this study are – Parascreen Device (rapid test for malaria Pan/Pf), Falcivax Device (rapid test for malaria Pv/Pf), Malascan Device (rapid test for malaria Pf/Pan) (all from Zephyer Biomedicals Goa), ParaHIT Total (rapid test for Pf & Pan Malaria species) (SPAN Diagnostics Ltd, Surat) and First Response Malaria Ag Combo Card test (pLDH/HRP2) (Premier Medical Corporation, Mumbai). Table 2.2.1 shows the characteristics of five RDTs used in the study.

Findings

During the study period, 409 patients (age 1 month to 69 years) were screened at the two sites. Two hundred thirty six patients (57.7%) were screened at Dindori and 173

Table 2.2.1: Characteristics of five RDTs used in the study

Manufacturer	Product name	Plasmodium species targeted (F= P *falciparum* V = *P. vivax* P = PAN)	Target Antigen	format	Sequence type of bound antibody			Required Volume (µl) of whole blood	Buffer Volume	Interm-ediate step	Time to results (mins)	Maximum Reading time (mins)	Result Interpretation
					C	T_1	T_2						
Zephyer Biomedicals Goa	Prascreen Device (Pan/Pf)	P, F	HRP2/ pLDH	Cassette	√	pLDH	HRP2	5	4 Drops	-	15	30	
Zephyer Biomedicals Goa	Malascan Device (Pf/Pan)	F, P	HRP2/ Aldolase	Cassette	√	Aldolase	HRP2	5	4 Drops	-	15	30	
Zephyer Biomedicals Goa	Falcivax (Pv/Pf)	F, V	HRP2/ Vivax specific pLDH	Cassette	√	pLDH	HRP2	5	4 Drops	-	15	30	
Premier medical corporation Mumbai	Frist Response pLDH/HRP2 combo	F, P	HRP2/ pLDH	Cassette	√	pLDH	HRP2	5	2 Drops	-	20	-	
SPAN Diagnostics Ltd. Surat	Para HIT Total	F, P	HRP2/ Aldolase/ pLDH	Dipstick	√	Aldolase/ pLDH	HRP2	8	4 Drops	Buffer into tube blood on stick, stick on tube	15	30	

Table 2.2.2 : Comparative performance of Rapid Diagnostic Test kits with traditional light microscopy and Polymerase Chain Reaction (PCR) for diagnosis of Malaria

	Parascreen	Falcivax	Malascan	First Response	Para HIT Total
Light Microscopy as Gold Standard (Reference)					
Sensitivity	93.2 (88.6-96.3)	88.4 (83.0-92.6)	90.5 (85.4-94.3)	95.8 (91.9-98.2)	65.8 (58.6-72.5)
Specificity	64.3 (56.9-71.2)	64.8 (57.4-71.8)	60.4 (52.9-67.6)	58.8 (51.3-66.0)	76.9 (70.1-82.8)
Positive Likelihood Ratio	2.6 (2.1-3.2)	2.5 (2.1-3.1)	2.3 (1.9-2.8)	2.3 (1.9-2.8)	2.9 (2.2-3.8)
Negative Likelihood Ratio	0.1 (0.1-0.2)	0.2 (0.1-0.3)	0.2 (0.1-0.3)	0.1 (0.04-0.14)	0.44 (0.36-0.55)
Positive Predictive Value	73.1 (67.1-78.6)	72.4 (67.2-78.1)	70.5 (64.3-76.1)	70.8 (64.8-76.3)	74.9 (67.6-81.2)
Negative Predictive Value	90.0 (83.5-94.6)	84.3 (77.2-89.9)	85.9 (78.7-91.4)	93.0 (86.8-96.9)	68.3 (61.4-74.6)
Percentage Agreement (Accuracy)	79.0	76.9	75.8	77.7	71.2
Kappa	0.58	0.53	0.51	0.55	0.43
PCR as Gold Standard (Reference)					
Sensitivity	86.6 (81.5-90.7)	83.1 (77.7-87.7)	85.7 (80.5-90.0)	89.2 (84.4-92.9)	61.0 (54.4-67.4)
Specificity	73.7 (65.3-80.9)	75.2 (67.0-82.3)	70.7 (62.2-78.2)	67.7 (59.0-75.5)	85.0 (77.7-90.6)
Positive Likelihood Ratio	3.3 (2.5-4.4)	3.4 (2.5-4.5)	2.9 (2.2-3.8)	2.8 (2.2-3.5)	4.1 (2.7-6.2)
Negative Likelihood Ratio	0.2 (0.1-0.3)	0.2 (0.2-0.3)	0.2 (0.1-0.3)	0.2 (0.11-0.24)	0.46 (0.38-0.55)
Positive Predictive Value	85.1 (79.9-89.4)	85.3 (80.0-89.7)	83.5 (78.2-88.0)	82.7 (77.5-87.2)	87.6 (81.5-92.2)
Negative Predictive Value	76.0 (67.7-83.1)	71.9 (63.7-79.2)	74.0 (65.5-81.4)	78.3 (69.6-85.4)	55.7 (48.5-62.6)
Percentage Agreement (Accuracy)	81.9	80.2	80.2	81.3	69.8
Kappa	0.61	0.58	0.57	0.59	0.41

Note: Values in parentheses are 95% confidential interval

(42.2%) were screened at Shivpuri. The mean age of the patients was 15.4 ± 14.2 years. Thirty seven patients (9%) were excluded for not fulfilling the study enrollment criteria. Microscopy examination reveals 190 (51.1%) patients were infected with malaria parasites- 57 (15.3%) with *P. vivax*, 122 with *P. falciparum* (32.8%) and 11 (3%) with both *P. vivax* and *P. falciparum*.

The overall sensitivity and specificity of First Response for malaria was 96 and 59%, Parascreen 93 and 64%, Malascan 90 and 60%, Falcivax 88 and 65% and by ParaHIT Total 66 and 77% respectively (Table 2.2.2). The RDTs sensitivity according to parasitaemia revealed that the First Response was most sensitive for diagnosis of *P. falciparum* (96%) and *P. vivax* (87%) as compared to other 4 RDTs especially for levels of parasitaemia above 200 parasite/ µl (Fig. 2.2.1 & 2.2.2).

Fig. 2.2.1 : *P.falciparum* detection rate of malaria RDTs at different level of parasite density (parasite/µl)

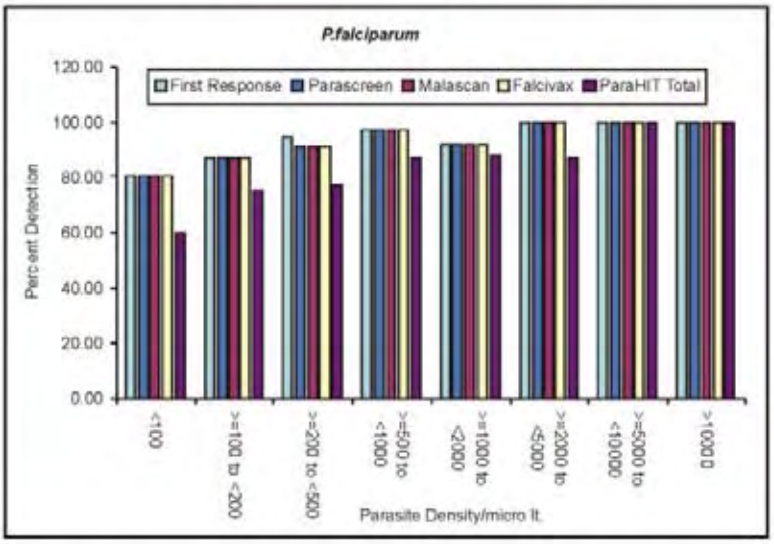
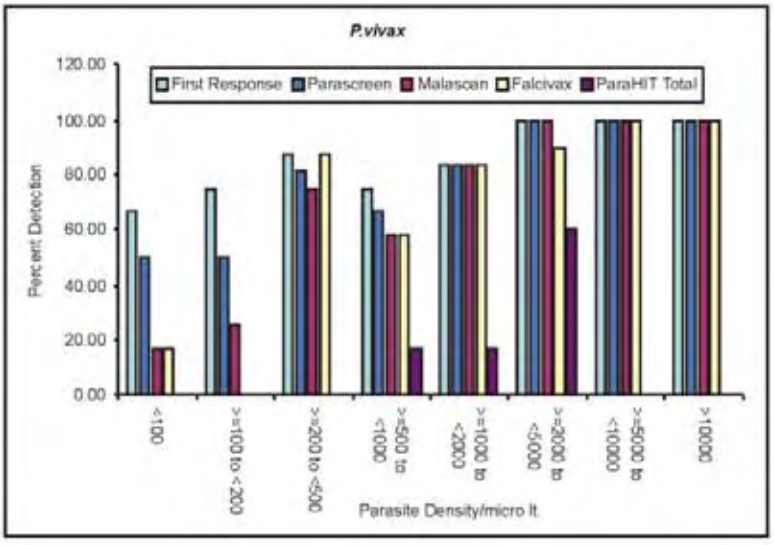


Fig. 2.2.2: *P.vivax* detection rate of malaria RDTs at different level of parasite density (parasite/µl)



Further, exposure of all RDTs to high temperature i.e. 35°C, 45° & 60°C and low temperature (-10°C) did not cause any loss of sensitivity for both *P. falciparum* and *P. vivax*. All RDTs except ParaHIT Total showed 100% matching results with microscopy and PCR (Table 2.2.3). There were no false positive/ false negative test results, however, there was some reduction in test line-intensity at high temperature. First Response clearly has an advantage over other RDTs. The Parascreen represented a good alternative. All other RDTs were relatively less sensitive to both *P. falciparum* and non falciparum infections.

Table 2.2.3 : Stability of *P. falciparum* and *P. vivax* at extreme high and extreme low temperature

RDTs	Temperature									
	35°C*		45°C*		60°C**		-10°C***		Normal	
	Pf	Pv	Pf	Pv	Pf	Pv	Pf	Pv	Pf	Pv
PARASCREEN	14	1	14	1	14	1	14	1	14	1
MALASCAN	14	1	14	1	14	1	14	1	14	1
FALCIVAX	14	1	14	1	14	1	14	1	14	1
FIRST RESPONSE	14	1	14	1	14	1	14	1	14	1
PARAHIT TOTAL	12	0	9	0	12	0	13	0	11	0

* RDT kept at 35°C/45°C for 90 days before testing.
** RDT kept at 60°C for 48 hours before testing
*** RDT kept at -10°C for one hour before testing
! *P. falciparum* parasite density ranged from 600-10000 parasites/µl
!! *P. vivax* parasite density 3880 parasites/µl



Use of RDT in the field

2.3. Preparation of a Field Site for Malaria Vaccine Trial in and around Jabalpur

Date of starting	:	May 2005
Duration	:	5 years
Status	:	Ongoing
PI	:	Dr. Neeru Singh
Funding	:	ICMR

Present study was undertaken in Bargi and Sihora Community Health Centres (CHCs) of district Jabalpur. The demographic health surveillance system established for this study is a national resource as it provides complete demographic information of resident population (about one lakh) of the villages in the 2 CHCs where any intervention/ clinical trial can be carried out. This longitudinal study also provides important information about the age groups which are at the highest risk for acquiring malaria. This data is invaluable for targeting the prevention and intervention strategies for the highest risk groups in these communities.

Objectives

The main objective of the immunoepidemiological component of this study is to evaluate longitudinal immune response in population that is naturally exposed to malaria in an endemic region (Central India) to know the development and maintenance of the immunity in different age groups.

Determination of antibodies

Methodology

The immune responses to the vaccine candidate antigens developed in the course of natural infection were measured by ELISA. Blood samples were collected from enrolled subjects of different age groups involving infants, children (both younger and older) and adults. They were tested for estimating species and stage-specific antibodies to all 13 (7 Pf and 6 Pv) antigens. Individuals with an antibody response >mean + 2SD than normal negative controls were categorized as antibody positive.

Findings

Age-wise increase in IgG level was observed. In general, young children showed low antibody responses against most of the antigens tested. Infants had lower titres when

compared to young children. Maximal response was observed in adults as compared to children or infants. Seropositivity with 7 Pf and 6 Pv antigens were compared between groups. Results were significant between groups in case of 7 Pf stage-specific (Fig. 2.3.1) and 6 Pv stage-specific antibodies (Fig. 2.3.2). The adults who developed naturally acquired immunity to both types of malaria had high antibody titres against CSP, MSP1, MSP2 and AMA1 for PF and MSP1, MSP2, AMA1 for PV. Gametocyte antigens showed comparatively lower response. Antibodies detected against peptides regarded as an indicator of exposure and with increase of antibody levels with age indicates continuous exposure and development of humoral immunity to malaria in the study population.

Immune response of pregnant women

Blood samples collected from enrolled pregnant women were tested for antibodies to both species as well as stage-specific peptides. In this group seroprevalence was higher in parasite positive cases. Most of the parasite positive individuals (*P. falciparum* and *P. vivax*) showed comparatively higher antibody response to all the peptides than the malaria negative individuals. The enrolled subjects were divided gravida-wise into three categories: primigravida, secundigravida and multigravida. Antibody responses of the three groups against individual peptides were compared. Significant differences ($P<0.05$) was observed between pregnant women of primigravidae as compared to secundigravidae and multigravidae for Pfmsp1, Pfama1, Pfg27, Pvcsp, Pvmsp1, Pvg25.

Fig. 2.3.1: Median absorbance and range against different Pf antigens among enrolled subjects

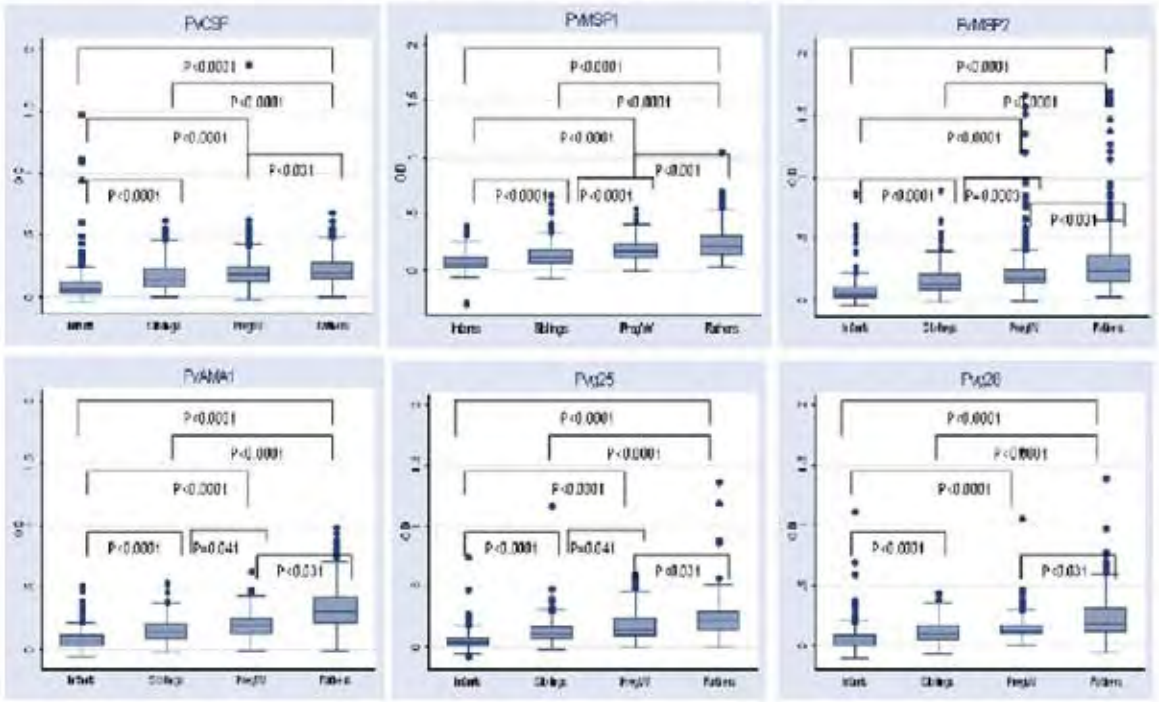
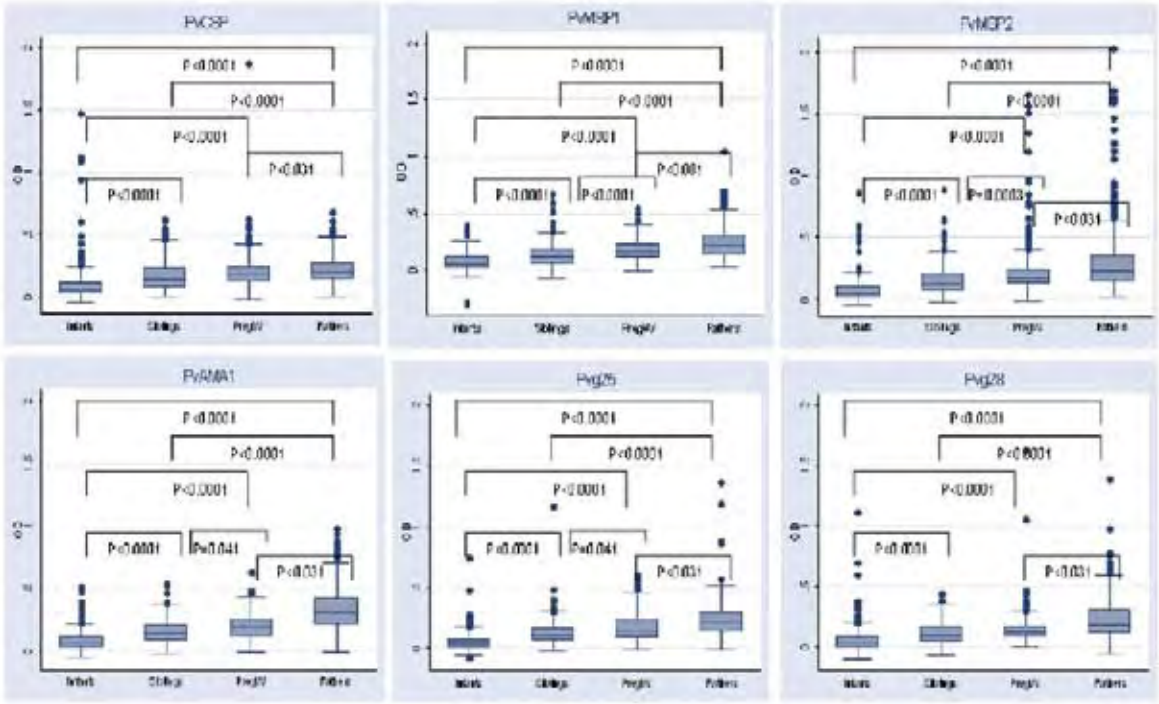


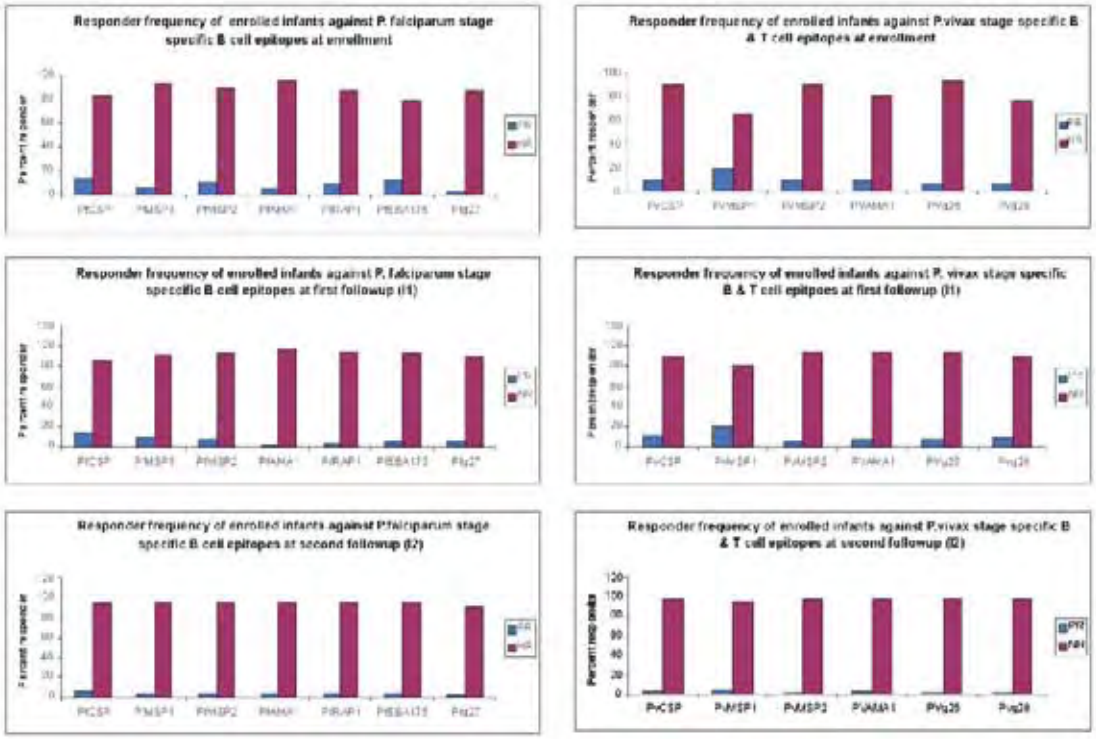
Fig. 2.3.2: Median absorbance and range against different Pv antigens among enrolled subjects



Mother to foetus immunity transfer

The infants' umbilical cord blood and mothers' placental blood (92 paired samples) were tested for antimalarial antibodies to both Pf and Pv antigens to determine the possible effects of maternal antimalarial IgG antibodies on placental infection and infection in infants. The relationship between antimalarial antibodies in infants' cord blood (C) and mothers' placental blood (P) were estimated. Species and stage-specific antibody responses were found to be nearly similar in cord and placental blood (P>0.05). This passive immunity was followed up to 2 years (before the acquisition of adaptive immunity). For first 9 months of life a progressive decline was observed in passive immunity among infants (Fig. 2.3.3.).

Fig. 2.3.3: Longitudinal immune response against different antigens among infants at 3 time point (age 3 month, 6 month and 9 month)



Role of Cytokines in Anemia Immunopathology

A group of healthy controls (HC), mild malaria anemia (MMA), moderate malaria anemia (MdMA) and severe malaria anemia (SMA) were tested for proinflammatory and anti-inflammatory cytokines, chemokines and growth factors (Figure 2.3.4). Following are the salient findings:

- Severe malaria anemia expressed lowest circulatory levels of IP-10 which is proinflammatory, TH and Tc cell chemoattractant CXC chemokine. It is hypothesized that immunopathogenesis of SMA needs to be critically analysed since it may reveal why subjects with SMA do not develop cerebral or other organ complications.
- SMA showed lower levels of IL-12 as compared to other groups.
- Higher TNF-α and lower IL-10 could also lead to development of SMA.

Immunocorrelates of cerebral/organ pathogenesis

A group of healthy controls (HC), mild malaria (MM), cerebral malaria (CM) and noncerebral severe malaria (SM) cases were tested for proinflammatory and anti-inflammatory cytokines, chemokines and growth factors (Fig. 2.3.5).

- SM group showed highest circulatory levels of IP-10.
- No significant difference was observed in IL-10 mediated antiinflammation among these groups.
- IL-12 levels were negatively associated with falciparum malaria severity that could also be related to the parasite burden.
- Fatal CM have significantly lower levels of VEGF, IL-4 and IL-12 than nonfatal CM, which showed lower angiogenesis repair capacity, suppression of erythoropoiesis and week TH2 response.

Fig. 2.3.4: Cytokines in Anemia Immunopathology

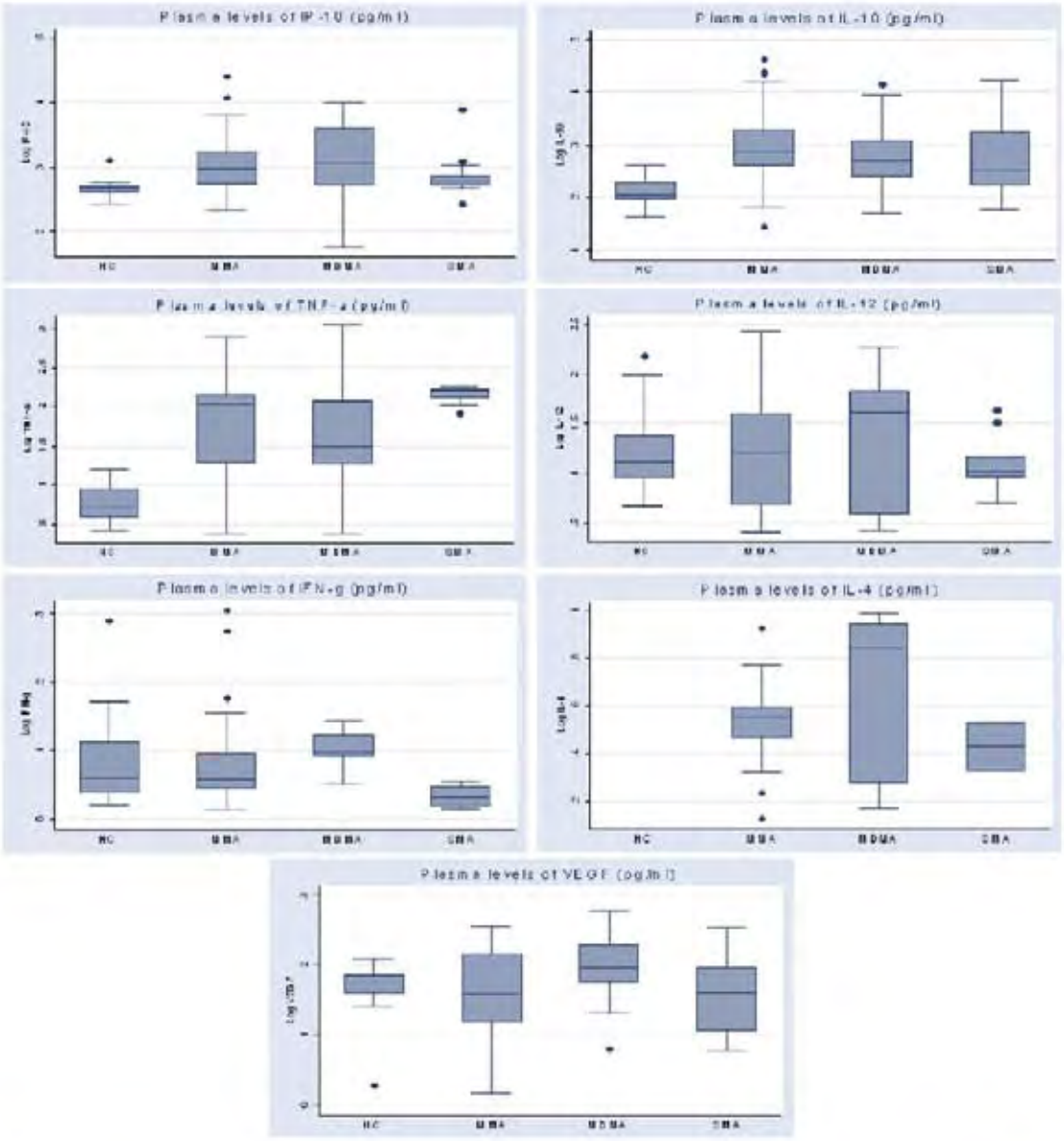
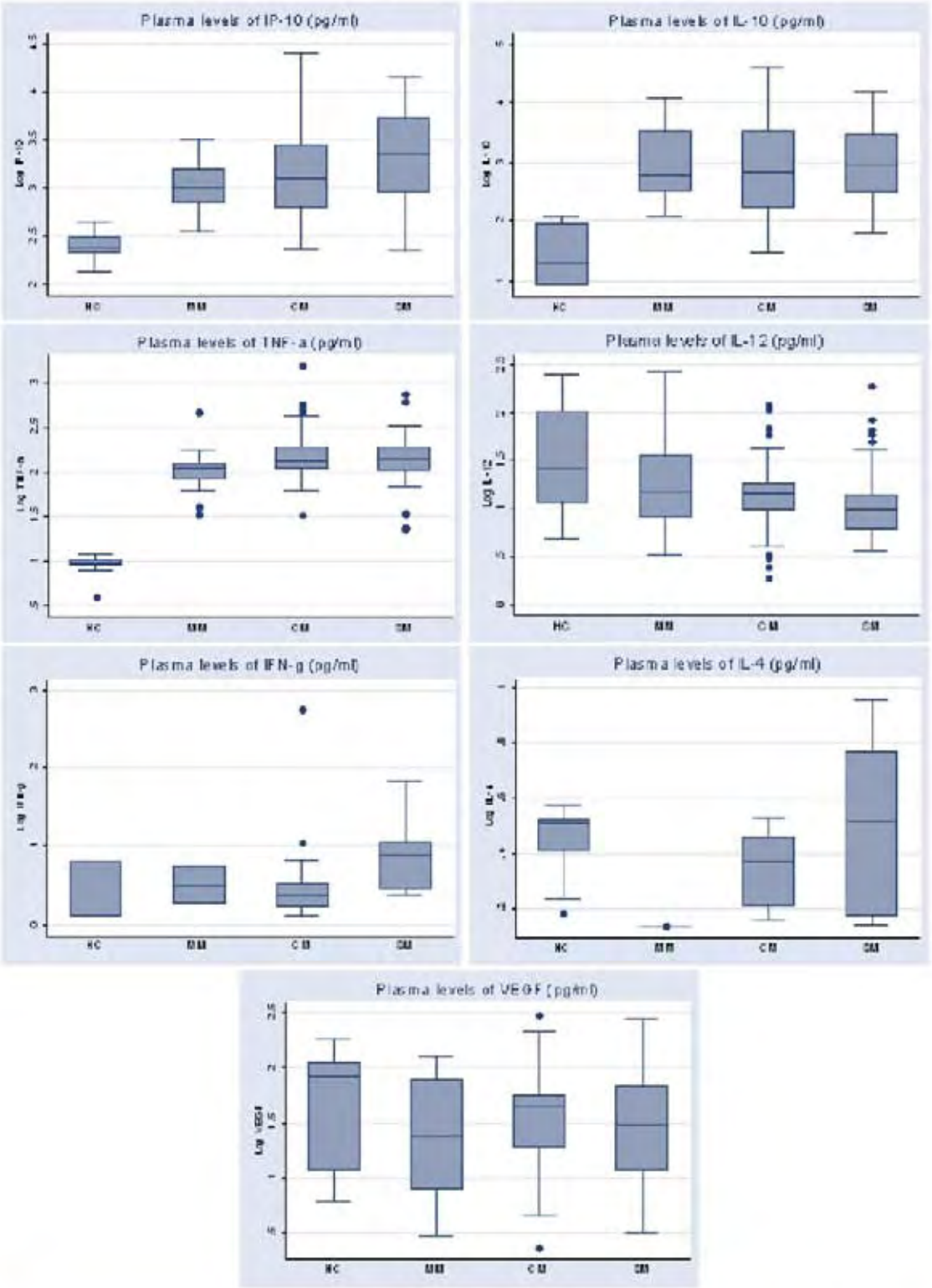


Fig. 2.3.5: Cytokines in Cerebral/organ pathogenesis



Lymphocyte proliferation assay: Lymphocyte transformation test was performed on a subset of cohort samples. The peripheral blood mononuclear cells (PBMC) were isolated from venous blood of subjects who had malaria in past. Proliferate responses against *P. falciparum* and *P. vivax* antigens were determined in individual set of PBMCs obtained above. Only one subset of adults and children of age 14 and above were included in this study. In general the study subjects responded to T-cell epitopes. The mean stimulation index (SI) was not significantly different among positive responders. The SI greater than 2 was taken as cut-off to determine the positive responders. The proliferative response to the mitogen (PHA) was continuous, indicating the viability of cells and response to PHA in these subjects. Five-day culture supernatants from individual lymphocyte samples were assayed by sandwich ELISA for IL-4 and IFN-γ using anti-human IL-4 and IFN-γ antibodies. MSP42 kd, FALVAC 1A H$^+$ have shown >2SI in 44% subjects whereas MSP19, FALVAC 1A H$^-$ have shown >2SI in 33% subjects. In-vitro levels of IFN- γ showed significantly higher levels among PBMCs stimulated with Pf antigens i.e. MSP83, FALVAC 1A H$^+$ compared to other antigens except MSP42. In contrast, IL-4 showed no significant difference, and CSP showed lowest levels of response. For Pv antigens Pvg28 showed maximal response and PvMSP1 was least responsive. SI showed no correlation with in-vitro IFN- γ and IL-4 responses.

Entomology Component

A total of 1360 *Anopheles culicifacies* and 37 *An.fluviatilis* collected from different localities were assayed for detection of sporozoites by sporozoite ELISA. Only 8 *An.culicifacies* were found positive for the presence of sporozoites (all for Pf strain) resulting in a sporozoite rate of 0.6. Further analysis revealed that almost all the sporozoite positives samples were detected during rainy season (Jun-Sep) that coincides with the main malaria transmission period. The *An.culicifacies* were further classified into the sibling species using cytotaxonomy and *An.fluviatilis* by Polymerase chain reaction (PCR). PCR analysis revealed that the majority of the *An.culicifacies* tested were of sibling species 'C' (68%) followed by species 'D' (24%) and species 'B' (8%). Out of total 184 *An.fluviatilis* examined, 181 were of sibling species 'T'. Only 3 specimens were identified to be sibling 'S'.

2.4. Genetic Polymorphism Analysis of Merozoite Surface Protein-1(msp1) Gene of *Plasmodium Falciparum*

Start Date	:	July 2009
Duration	:	1 year
Status	:	Ongoing
PI	:	Dr. P. K. Bharti
Funding	:	Intramural

The merozoite surface is structurally complex and carries the most abundant protein (MSP-1) on surface of the invasive blood stage of malarial parasites. Due to its abundant nature it is the leading candidate for a vaccine against *Plasmodium falciparum*. Comparative sequences data of MSP-1 has revealed the presence of 17 blocks that are either variable, conserved or semi conserved. Blocks 1, 3, 5, 12 and the 17 sequences are generally conserved. In seven regions (blocks 2, 4, 6, 8, 10, 14 and 16) the sequences were extremely divergent, while in the remaining blocks (7, 9 11, 13 and 15) the sequences were semi-conserved. Thus the MSP-1 gene sequence polymorphism allow grouping into two families MAD20/FC27 or Wellcome/K1 families with the exception of block 2 where there is a third allele known as RO33. Notably, block 2 shows size variation in a species dependent manner.

Objective

The main objective of the study is to determine the genetic polymorphism of vaccine candidate antigen Merozoite surface protein 1 (MSP1).

Methodology

The 555 bp polymorphic region of block 2, merozoite surface protein 1 gene was amplified and sequenced. A total of 103 *P. falciparum* infected blood samples from Baigachak area of Dindori district were used for the amplification and sequencing of merozoite surface protein 1 (block 2). The samples were collected from July 2009 to Oct 2009. Of the 103 samples amplified 58 samples were sequenced and analyzed for MSP 1 gene.

Findings

Figure 2.4.1- 2.4.3 depicts the overall allelic prevalence recorded in block 2 of MSP-1 gene. Among these K1 has maximal prevalence 43% followed by MAD20 (31 %) and RO33 (26%).

The nucleotide and the deduced amino acid sequence of block 2 of MSP1 were found to be highly polymorphic among the isolates. A total 10 types of variants were found in the K1 type alleles (Fig 2.4.4). MAD20 type allele showed 6 variants (Fig 2.4.5), while RO33 was semi conserved with only three variants (Fig 2.4.6). Interestingly, the amino acid sequence comparison with 2005 sequence data revealed increasing the complexity of MSP1 gene particularly in K1 allelic family.

Fig 2.4.1: K-1 Allelic Family (2005)

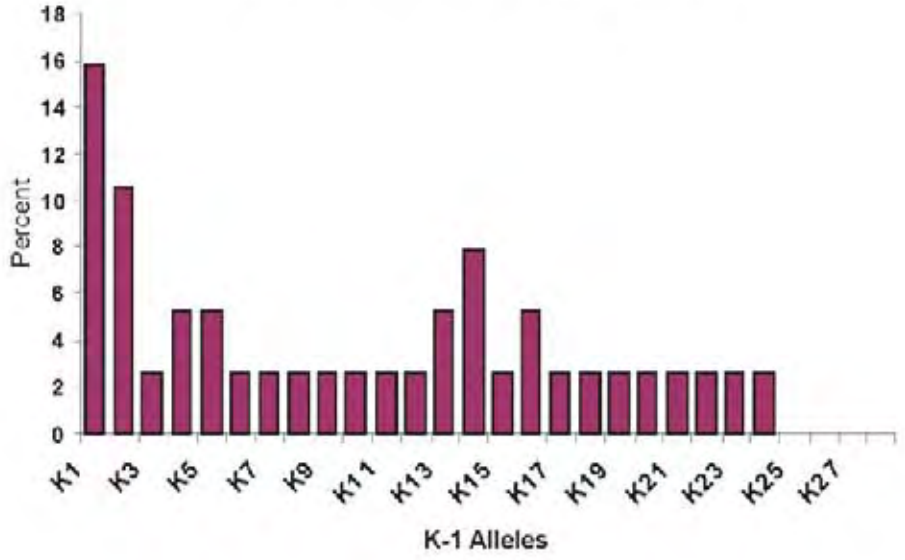


Fig 2.4.2: K-1 Allelic Family (2009)

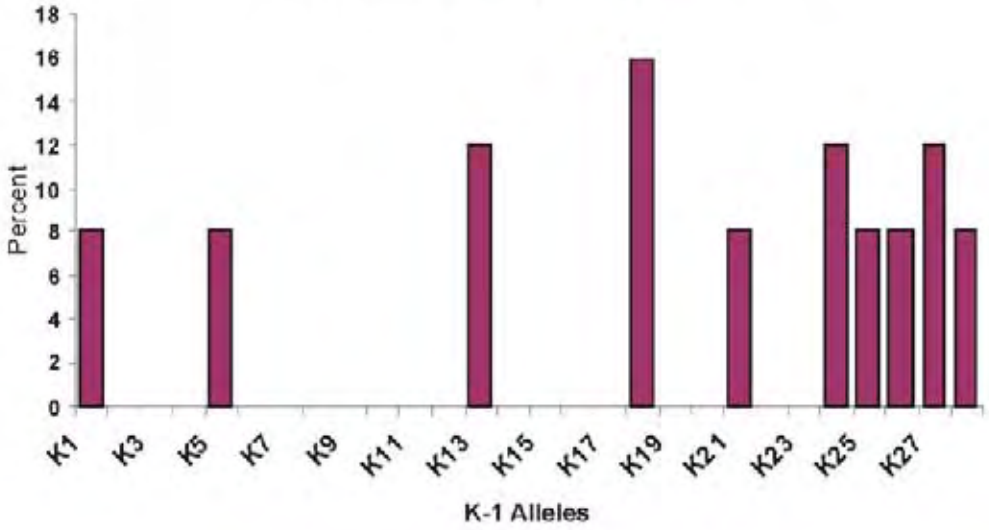


Fig 2.4.3: MAD-20 Allelic Family (2009)

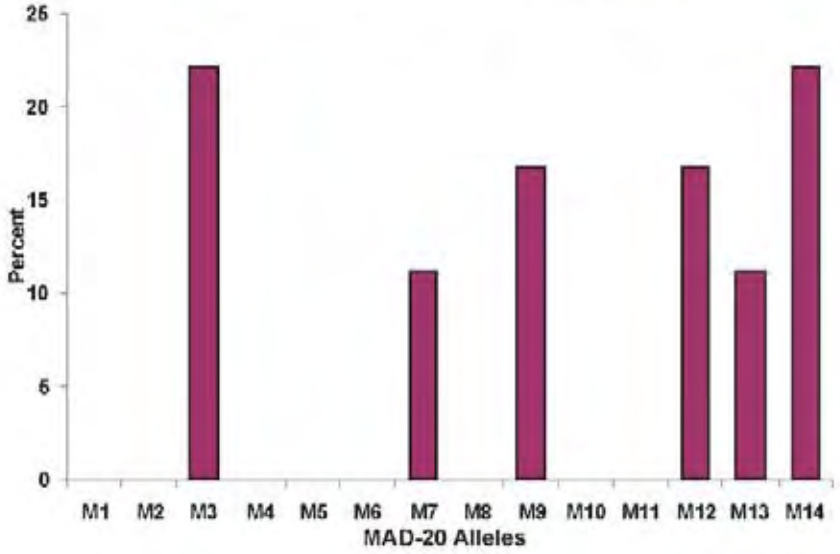


Fig 2.4.4: Alignment of deduced amino acid sequences of the variable block 2 of K1 allelic family

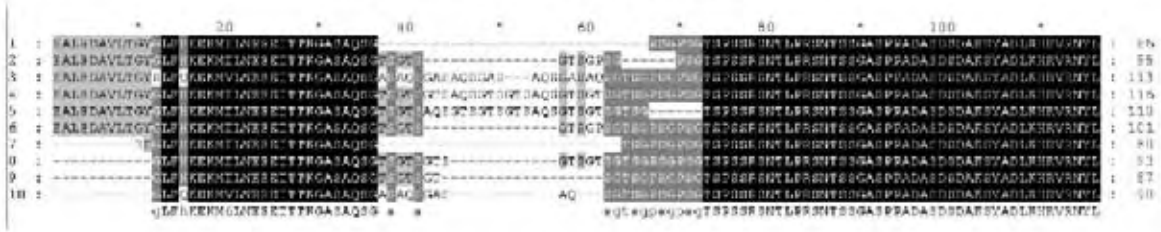


Fig 2.4.5: Alignment of deduced amino acid sequences of the variable block 2 of MAD20 allelic family

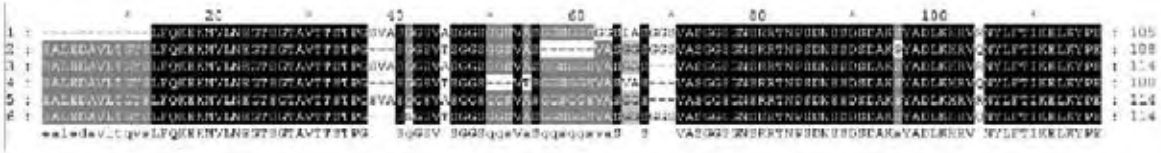


Fig 2.4.6: Alignment of deduced amino acid sequences of the variable block 2 of RO33 allelic family



2.5. Field Evaluation of Bacticide Dt (Dispersible Tablets), a Formulation of *Bacillus Thuringiensis Var.israelensis* H-14, Strain164 Against Larvae of Mosquito Vectors

Date of starting	:	July 2009
Duration	:	One year
Status	:	Completed
P I	:	Mr. Gyan Chand
Funding	:	Biotech Int. Ltd, Delhi

The study was carried out to evaluate the efficacy of BACTICIDE DT in field condition against the larvae of dengue, malaria and filaria vectors. The specific objectives of the study are as follows:

- To evaluate the effectiveness of BACTICIDE DT formulation for control of *Aedes aegypti, An. culicifacies* and *Culex quinquifasciatus* in a locality.
- To assess the persistence of BACTICIDE DT in different type of mosquito breeding habitats.
- To assess the operational dose and its frequency of use.

Methodology

The study was carried out in continuation of trial of BACTICIDE DT of an earlier study area of Jabalpur city. An area of about one sq. km. was selected in Ghamapur and 0.5 sq. km in Garha area of Municipal Corporation of Jabalpur for evaluating the efficacy of BACTICIDE DT against *Aedes aegypti* and other vectors. Area was explored for the presence of mosquito breeding in water filled containers in and around the residential premises. Water was collected with 3 dips using a bowl were taken from each positive container. Containers showing 4 or more larvae per dip were considered for treatment with BACTICIDE DT tablet formulation at one tablet per container having surface area of up to one sq. meter. Two tablets were applied where volume of water was more than 50 liters. Impact of BACTICIDE DT on larval density was monitored in these containers on day 1, 2, 3, 7, 14, 21 and day 28. Gwari Ghat (Jabalpur) having similar dwelling pattern was selected as control area where no intervention was provided. Baseline survey carried out in these areas revealed the House index (HI), Container index (CI) and Breteau index (BI) of 25.5, 9.0 and 26.8 in the experimental area. The main breeding habitats were found to be cement tanks (24%) followed by mud pots (19%) and metal drums (12%) in that order. In comparison, in Gwari Ghat locality 160 houses were surveyed. HI, CI and BI and were found to be 19.3, 5.9 and 20 respectively.

Findings

In all 82 containers were treated with BACTICIDE DT. Eighty containers were positive for *Aedes aegypti* alone and two were positive for mix infestation of *Ae. aegypti* and Anophelines. Average larval density of instar 1-2 and instar 3-4 was 23.2 and 52.9 per three dips on day 0 in experimental area and 19.5 and 24.5 per three dips in the control area.

There was a significant reduction (corrected) in larval density in both types of larval instars, however the effect was more pronounced on instars 3 and 4 (Table-2.5.1). Fifty seven containers did not require re-treatment with BACTICIDE DT, as there was no increase in the larval density in these containers till day 21. The remaining 25 containers required re-treatment on day 7 (6), day 14 (7) and day 21 (12) (Table 2.5.2 - 2.5.4).

The study shows that one tablet of BACTICIDE DT of 400 mg provides more than 80% reduction in over 80% of the treated containers within 15 days and in 70% containers upto 21 days. Therefore 1 tablet per container having surface area up to one sq. meter or having an amount of 50 litre of water is sufficient to provide protection for 15 days, although the BACTICIDE DT was assumed to persist even longer as indicated by its effectivity against *Aedes aegypti* larval stages (Table 2.5.2). As no breeding of *Culex quinquefasciatus* was observed in the tested containers, Bacticide DT effect against culex breeding could not be ascertained.

Table 2.5.1: Percentage reduction in larval density of *Aedes aegypti* in Experimental area (Corrected as per Mulla's Formula)

Days	1st - 2nd instar	3rd - 4th instar
Day 1	54.1	56.6
Day 2	82.5	86.2
Day3	92.65	95.3
Day7	91.0	95.7
Day14	72.9	96.3
Day21	74.8	90

Table 2.5.2: Impact of BACTICIDE DT on the density of *Aedes aegypti* larval stages (All Containers)

Study group	Days	D0	D1	D2	D3	D7	D14	D21	D28
	No. cont.	82	82	82	82	82	82	73	49
Exp.	1-2 instar	23.2	10.4	3.6	1.7	2.7	7.1	5.5	3.5
	3-4 instar	52.9	21.3	6.4	2.1	2.6	2	4.8	6.2
	Pupa	6.0	3.0	1.2	0.7	0.6	0.1	0.8	2.3
Control	No Cont	32	32	32	32	32	32	32	19
	1-2 instar	19.5	19	17.4	19.7	27.2	22.2	18.3	15.8
	3-4 instar	24.5	22.7	21.5	20.7	28.6	24.6	27.8	21.8
	Pupa	7.8	7.9	7.8	6.0	3.2	4.1	7.9	1.4

Table 2.5.3: Impact of Bacticide DT on the density of *Aedes aegypti* larval stages (Containers which were not retreated)

Study group	Days	D0	D1	D2	D3	D7	D14	D21	D28
	No. cont.	57	57	57	57	57	57	48	30
Exp.	1-2 instar	23.8	9.5	2.3	0.2	0.5	2.2	2.1	4.7
	3-4 instar	57.9	21.0	5.2	0.7	0.9	1.0	1.5	4.9
	pupa	4.0	2.6	1.4	0.2	0.2	0.1	0.3	2.2
Control	No. Cont.	32	32	32	32	32	32	32	19
	1-2 instar	19.5	19.0	17.4	19.7	27.2	22.2	18.3	15.8
	3-4 instar	24.5	22.7	21.5	20.7	28.6	24.6	27.8	21.8
	pupa	7.8	7.9	7.8	6.0	3.2	4.1	7.9	1.4

Table 2.5.4: Impact of Bacticide DT on the density of *Aedes aegypti* larval stages (Containers which were retreated on day 7,14, 21 and 28)

Study group	Days	D0	D1	D2	D3	D7	D14	D21	D28
	No. cont.	25	25	25	25	25	25	25	19
Exp.	1-2 instar	21.9	12.4	6.8	5.1	7.9	18.3	12.1	1.7
	3-4 instar	41.3	21.9	9	5.3	6.8	4.2	11.2	8.5
	pupa	10.6	5.4	2.5	2	1.4	0.1	2.0	2.4
Control	No. Cont.	32	32	32	32	32	32	32	19
	1-2 instar	19.5	19.0	17.4	19.7	27.2	22.2	18.3	15.8
	3-4 instar	24.5	22.7	21.5	20.7	28.6	24.6	27.8	21.8
	pupa	7.8	7.9	7.8	6.0	3.2	4.1	7.9	1.4

2.6. Microfilaria Survey in Madhya Pradesh

Date of starting	:	January 2010
Duration	:	6 months
Status	:	Completed
P I	:	Gyan Chand
Funding	:	Intramural

Filariasis is the most neglected vector borne disease due to low or no mortality associated with it. In Madhya Pradesh there are 11 districts endemic for filarisis. To achieve the goals of global program for elimination of filarisis by 2015 mass drug administration is being carried out once in a year since 2005. Four rounds of MDA with DEC were completed by the end of the year 2008. Fifth round is scheduled to be taken up in April 2010 and combination therapy of DEC and Albendazole will be administered. Prior to this a cross sectional microfilaria survey was carried out in three districts to ascertain the mf rate to provide feed back to State Government and to formulate a new study.

Objective

To determine the microfilaria rate in villages under Mass Drug Administration (MDA) regime.

Methodology

A cross sectional survey was carried out with the target to collect at least 100 blood slides from each selected villages. Thick blood smear was prepared taking about 40 microlitre of blood by finger prick method. Blood slides were stained with Wright's stain. Children below 5 years of age were excluded from the study.

Findings

Over all 1737 blood smears were collected. One hundred thirty seven slides were positive for microfilaria (Mf rate7.9%). Mf rate was significantly higher in males (8.9%) than in female (6.7%) ($Z=2.05$, $p<0.05$) (Table 2.6.1). In general, mf rate significantly increased with the advancement of age up to the age group of 30-35 years then declines ($\chi^2 = 28.4$, $p<0.0015$). However, in females age wise no significant difference was observed ($\chi^2 = 9.6$ df10 $p>0.4$) (Fig.2.6.1.).

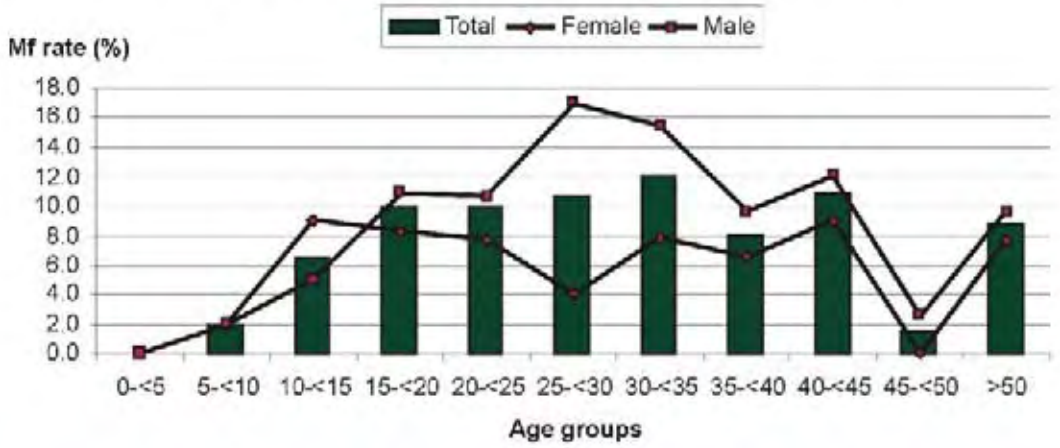
Despite 4 rounds of MDA no significant reduction in mf rate in Ajay Garh tehsil was observed when compared with the earlier study carried out by RMRCT ($\chi^2 = 1.33$ $p>0.24$

from 1993). The issue was brought to the notice of the local Government health officials who revealed that there was only about 50% compliance of MDA. On the contrary, the villagers reported that compliance level was no more than 10%. Thus in order to eliminate filariasis, intervention program needs to be strengthened by creating awareness through IEC.

Table 2.6.1: Village wise Mf rate

District	Village	Female			Male			Total Mf rate
		N	POS	Mf rate	N	POS	Mf rate	
Chattarpur	ATRAR	42	1	2.4	104	11	10.6	8.2
	BAGHMAU	53	6	12.8	54	3	5.6	8.4
	KHAPTYA	52	3	6.1	79	8	10.1	8.4
	KODAN	54	3	5.9	59	2	3.4	4.4
	PEERA	3	0	0.0	42	1	2.4	2.2
	RAGOLI	35	1	2.9	82	9	14.5	10.3
	TIKURI	24	2	9.1	71	10	14.1	12.6
Narsighpur	**TOTAL**	**263**	**16**	**6.5**	**471**	**44**	**9.3**	**8.2**
	CHICHALI	**109**	**12**	**12.4**	**143**	**12**	**8.4**	**9.5**
	BAHIRWARA	52	2	4.0	77	3	3.9	3.9
	HARDI	57	3	5.6	74	12	16.2	11.5
Panna	KUNWARPUR	54	2	3.8	112	10	8.9	7.2
	MAJHGAI	69	8	13.1	85	8	9.4	10.4
	SUHWAHA	49	-	0.0	46	3	6.5	3.2
	TOTAL	**281**	**15**	**5.6**	**394**	**36**	**9.1**	**7.6**
Umaria	**CHANDIA**	**30**	**-**	**0.0**	**46**	**2**	**4.3**	**2.6**
	GRAND TOTAL	**683**	**43**	**6.7**	**1054**	**94**	**8.9**	**7.9**

Fig.2.6.1: Sex wise microfilaria rate in study villages



3. COMMUNICABLE DISEASES

3.1. Prevalence of Pulmonary Tuberculosis in Jabalpur District of Madhya Pradesh

Date of starting	:	January 2009
Duration	:	1 Year 5 Months
Status	:	Ongoing
PI	:	Dr. V.G.Rao
Funding	:	WHO through Model OTS Project

This study has been approved by the Central TB Division, Govt. of India and is being carried out as one of the sentinel site study in urban as well as rural population of Jabalpur district. The other sentinel sites in the country are: AIIMS, New Delhi; PGIMS, Chandigarh; JALMA, Agra; MGIMS, Wardha and NTI, Banglore.

Objectives

To estimate the prevalence of bacillary tuberculosis in Jabalpur District of Madhya Pradesh among population aged 15 years or above.

To study the changes in the prevalence rate on follow-up surveys using similar methodology in future at regular intervals of five years.

Methodology

This is a cross sectional survey conducted among the urban as well as rural population of Jabalpur district of Madhya Pradesh. The required sample size has been estimated to be 90,000 adults aged ≥15 years for a prevalence of 2.4/1000 bacteriologically positive tuberculosis with a precision of 20% at 95% confidence level with a design effect of 2 and a coverage for examination of at least 90%. District is the sampling universe for the study. Rural and urban clusters have been sampled separately so that the rural-urban distribution in the sample is similar to the rural-urban distribution of population in the district. The eligible persons ≥15 years were screened for symptom inquiry after registering the entire population in the selected clusters. Two sputum samples, one spot and one overnight were collected in a sterilized McCartney's bottle and examined for microscopy and culture.

Individuals with positive for AFB on smear and /or culture was considered as a case of pulmonary tuberculosis. All diagnosed cases are referred to the nearest DOTS centre for anti-TB treatment as per the RNTCP guidelines.

Findings

The project work was initiated in Feb. 2009. The field survey in the rural as well as in urban population has been completed. Laboratory examination of the sputum samples (smear & culture) has also been completed. The details of the census, number of symptomatics, sputum collection and sputum positive cases along with the coverage are given Table 3.1.1.

Of the total 99595 eligible individuals, 95141 (95.5%) were screened for chest symptoms and 7931 (8.3%) were found symptomatic. Sputum was collected from 7456 (94.0%) symptomatic individuals who were eligible for sputum collection. A total of 221 cases (smear/culture positive) have been identified and are referred to the nearest DOTS centre for anti-TB treatment as per the RNTCP guidelines.

Drug susceptibility testing (DST) has also been undertaken and is being carried out by proportion method for first line drugs namely streptomycin(S), Isoniazide(H), rifampicin(R) and ethambutol(E). So far, it has been completed for 158 isolates. Of these, 24 (15.1%) isolates had mono drug resistance (S=12, H=11, R=1). One isolate was multidrug resistant i.e. resistant to H & R. Twelve (7.6%) isolates were resistant to two drugs. Of the twelve, 9 isolates were resistant to S & H, 2 to R & E and 1 was resistant to H & E. One isolate was found to be resistant to S, H & E. The study is in progress.



Sample processing in mycobacteriology lab

Table 3.1.1: Census, sputum eligible and PTB cases in Jabalpur district

Area	Taluq/ Municipal corp.	Total Census	Eligiblefor Screening (>15)	Total Screened	Total Sputum Eligible	Total Sputum Collected	Sputum +ve cases
Rural	Kundam	7679	4833	4667 (96.5)	586 (12.56)	570 (97.27)	25
	Sihora	16429	11143	10980 (98.4)	1211 (11.3)	1181 (97.52)	44
	Patan	17516	11863	11309 (95.3)	1117 (9.88)	1074 (96.15)	37
	Jabalpur	16768	12202	11900 (97.2)	872 (7.33)	841 (96.44)	30
	Total	58392	40041	38856 (97.4)	3786 (9.74)	3666 (96.83)	136
Urban	JBP Municipal Corporation including Cantonment area	79289	59554	56285 (94.51)	4145 (7.36)	3790 (91.43)	85
	Total	137681	99595	95141 (95.52)	7931 (8.33)	7456 (94.01)	221

Figures in parentheses indicate percentages.

3.2. Epidemiology of Viral Hepatitis in Primitive Tribes of Madhya Pradesh, Chhattisgarh, Jharkhand and Orissa, India

Date of starting	:	March, 2006
Duration	:	4 Years
Status	:	Completed
PI	:	Dr. V.G. Rao
Funding	:	ICMR

Viral hepatitis is caused by different viruses that belong to different taxonomical families and genera. HAV and HEV are transmitted by fecal-oral route. Mostly, drinking water or consumption of food contaminated with sewage water results in local outbreaks and epidemics. HBV and HCV are blood-borne viruses and their transmission occurs through contaminated blood, blood products and through improperly sterilized needles/syringes. HBV can also be transmitted through sexual routes. HDV is a defective virus needing active HBV replication for its multiplication. Thus, the spread of this virus is restricted to individuals with active HBV replication. HDV infection leads to a severe liver disease(s). The prevalence of these viruses in tribal areas of India mostly remains unknown.

Objectives

To determine the prevalence of antibodies to hepatitis A and hepatitis E viruses.

To determine the prevalence of hepatitis B, C and delta viruses.

To assess the risk factors for transmission of hepatitis viruses.

To determine the circulating genotypes of HBV & HCV and prevalence of pre-core and basal core promoter mutants of HBV.

Methodology

This was a cross sectional epidemiological ICMR task force study and was undertaken among primitive tribal communities in different parts of the country. The primitive tribes in Madhya Pradesh and Chhattisgarh were covered by RMRCT, Jabalpur. The study was conducted in seven primitive tribes of Madhya Pradesh and Chhattisgarh viz. Baigas, Bharias, Saharias in Madhya Pradesh and Abujhmarias, Hill Kowas, Kamars and Birhors in Chhatisgarh. A written informed consent was obtained from all the participants in the consent form prepared in local language. The blood samples were collected from the

study population; plasma/serum was separated on site, aliquoted and transported to the laboratory maintaining the cold chain. Serology for HAV, HBV and HCV was conducted by using commercial ELISA kits. HBV genotyping was carried out at National Institute of Virology, Pune. Polymerase Chain Reaction (PCR) was employed to detect HBV DNA and for genotyping.

Findings

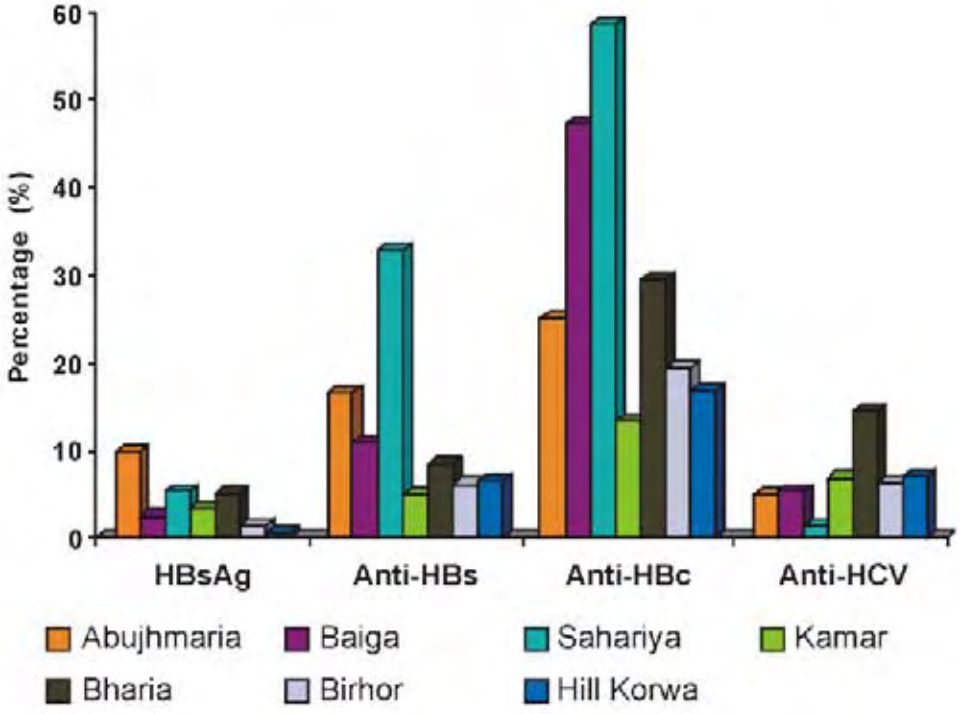
A total of 1223 subjects were screened in the study. Prevalence of water -borne hepatitis is shown in Table 3.2.1. The overall HAV prevalence was found to be ranging between 95 to 100% in all the tribal communities. The prevalence of Anti HEV ranged between 23.7% and 65.1% among them. Figure 3.2.1 shows the prevalence of blood -borne hepatitis. The HBsAg prevalence was found to be ranging between 0.6% to 9.8% in these tribes. The prevalence of Anti HBs and Anti HCV was found to be ranging between 4.9 - 32.9% and 1.2 - 14.5% respectively. High Anti HCV prevalence was found in Bharia tribe (14.5%). Molecular studies of HBV isolates indicated a predominance of genotype D in the region. Twenty four anti HCV positive samples were tested for HCV RNA at NIV, Pune. HCV RNA could not be detected in any of the samples.

The findings of the study indicate that viral hepatitis infection is an important problem in primitive tribes of Madhya Pradesh and Chhattisgarh. Control measures in the form of HBV vaccination and IEC strategies regarding the transmission and prevention are necessary among them.

Table 3.2.1: Prevalence of antibodies to water-borne hepatitis

Tribes	Anti-HAV			Anti-HEV		
	Tested	+ ve	% + ve	Tested	+ ve	% + ve
Abujhmaria	66	64	97.0	42	18	42.9
Baiga	74	74	100.0	69	41	59.4
Sahariya	167	165	98.8	168	48	28.6
Kamar	246	237	96.3	241	57	23.7
Bharia	233	223	95.7	229	149	65.1
Hill Korwa	157	154	98.1	151	58	38.4
Birhor	240	228	95.0	239	140	58.6

Fig. 3.2.1: Prevalence of markers for blood borne hepatitis



4. COMMUNITY HEALTH

4.1. Health and Nutritional Profile of Baiga Tribe of Balaghat and Dindori District, Madhya Pradesh

Date of starting	:	January 2009
Duration	:	1 Year
Status	:	Completed
PI	:	Dr. T. Chakma
Funding	:	Dept. of Tribal Welfare, Govt. of MP

Madhya Pradesh has a total population of 603.48 lakhs as per 2001 census of which 122.33 lakhs are tribals. Baiga's are one of the oldest aboriginal tribe of Madhya Pradesh and found mainly in Balaghat, Mandla and Dindori districts. Total population of Baiga was about 17146 spread over in 190 villages. The present study was undertaken at the request of the Baiga Development Authority, Balaghat and Dindori.

Objective

The main objective of the study was to assess health and nutritional status of Baiga tribe of Balaghat and Dindori District.

Methodology

Cross sectional study was carried out in 22 sampled villages of Baihar Tehsil in Balaghat district and 23 sampled villages of the three blocks - Bagaj, Karanjia and Samnapur in Dindori district. Demographic and socio-economic particulars were collected from households by personal interview in a pre-coded proforma. Clinical examinations were carried out by a medical officer for the presence of nutritional deficiencies and other morbidities. Systolic and diastolic blood pressures were measured in sitting posture using digital sphygmomanometer. Anthropometric measurement such as height and weight were taken by using SECA digital balance and anthropometric rod by a trained investigators. Dietary assessment was carried out from 10% households by 24 hours recall method from the women who cook and serve food to household members. Haemoglobin estimation was done by modified cyanmethaemoglobin method. Stool samples were collected from school going children for identification of ova and cyst. Data was analyzed using SPSS 11.5 statistical software.

Findings

Balaghat District

A total of 1197 individuals of different age groups from 436 households in 22 villages were surveyed. The average family size was 6.0 and 60% of the families had children with birth order of more than 4. A total of 41% populations were illiterate, 21.6% had primary education and 18.8% were educated up to middle school. More than 81% household uses tube well as source of drinking water, while 15.6% were using open well and 3% uses stream water for drinking. Only 1.6% households had sanitary latrine.

Out of 226 preschool children (1-5 years) the proportion of children with low weights (<-2SD) was 65.9%, while severely underweight (<-3SD) was 35.4%. The extent of stunting (<-2SD) was 49.6%, while 28.8% were severely stunted (<-3SD). The number of wasted children (<-2SD) were 42.3% and severely wasted (<-3SD) was 10.7%. Similarly among 137 adolescents, the proportion of underweight (<-2SD) was 44% while stunting was 10.7%. Among 303 adult males and 388 females population, 55.8% males and 62.9% of females had chronic energy deficiency (BMI<18.5). The mean anthropometric measurements of Baiga tribe were lower as compared to the respective values for other tribal children of M.P. as well as NCHS standards (Fig. 4.1.1 - 4.1.4).

Over all acute respiratory infection (25.6%) was the most common morbidity followed by fever (22.4%) and scabies (9.3%) among the preschool children. Cataract in elderly population (4.7%) and pelvic inflammatory disease among female was 2.6%. One hundred twenty four stool samples were collected and microscopic examination revealed the presence of round worm (17%) and hook worm (16%). The most common intestinal parasitic infestations observed among school children was round worm (16.9%) and hook worm (16.1%), followed by dwarf tape worm (*H. nana*) 5.6% and pin worm (*E. vermicularis*) 2.4%.

Cereals formed the bulk of Baiga diet. Consumption of protective foods such as pulses, flesh food, milk, fruits, oil and fats were grossly inadequate. As a result the intake of micronutrients was far below the recommended levels in all the age groups. None of the children of age up to 6 years exhibited any signs of Kwashiorkor, while the prevalence of Marasmus was 1.6%. The prevalence of Bitot's spot (4.7%), conjuctival xerosis a sign of vitamin-A deficiency was 9.8% and Angular stomatitis was 3.1%. Overall the utilization of health services was poor.

Dindori District

A total of 1446 individuals of different ages from 573 households were surveyed. Three hundred and eighty eight blood samples were collected for estimation of haemoglobin levels. Two hundred eight stool samples were also collected from school children for assessing parasitic load in the community. Most of the Baiga families were nuclear (83.9%). About 50% of the households have open well as a source of drinking water, while 34.2% use stream water for drinking.

The mean anthropometric measurement was lower than those of all age & sex matched values for rural children of Madhya Pradesh as well as NCHS. Of the 286 preschool children, the proportion of under weight children (<-2SD) was 63.7%, while 27.34% were severely underweight (<-3SD). The extent of stunting (<-2SD) was 50.3%, while 29.6% were severely stunted. Children with wasting (<-2SD) was 31% and severe wasted (<Median-3SD) was 9.3%. Among 175 adolescents, the proportion of underweight (<-2SD) was 52% and stunting was 58.5%. Among 369 male and 433 female adults, 46.9% males and 54.1% of females had chronic energy deficiency (BMI< 18.5).

Cereals formed the bulk of Baigas diet while millets (Maize & Vergu) also consumed in the form of *'Pej'*. The intake of food stuffs was below the RDA. Consumption of qualitative foods such as legumes, milk, green leafy vegetables, fruits, oil and fats were grossly inadequate. The intake of all the nutrients except calcium was below the recommended levels. The intake of *Cassia tora* (chakoda leaves) was very common in the daily diet, which is one of the rich source of calcium. The intake of micronutrients especially vitamin A, iron and riboflavin was much below the recommended level in all the age groups. The prevalence of Bitot's Spot a sign of vitamin-A deficiency and Angular stomatitis was 6.8% and 2.1% respectively.

Overall malaria was the most common morbidity (21.4%) followed by acute respiratory infection (6.6%) and dysentery (1.5%). In the elderly population prevalence of cataract was 5.1%. Among non pregnant non lactating (NPNL) women pelvic inflammatory disease (PID) was the most common morbidity (12.3%). In pre-school children acute respiratory infection was most common morbidity (15.6%) followed by diarrhea (3.4%), while conjunctival xerosis and bitot's spot was 5.9% & 1.4% respectively. The prevalence of emaciation (severe form of protein energy malnutrition) was 3.7%. Among preschool children 63.7% were underweight and 27.3% severely underweight.

Fig. 4.1.1: Comparison of Height of Baiga Children (Male) with Tribals (NNMB) and NCHS

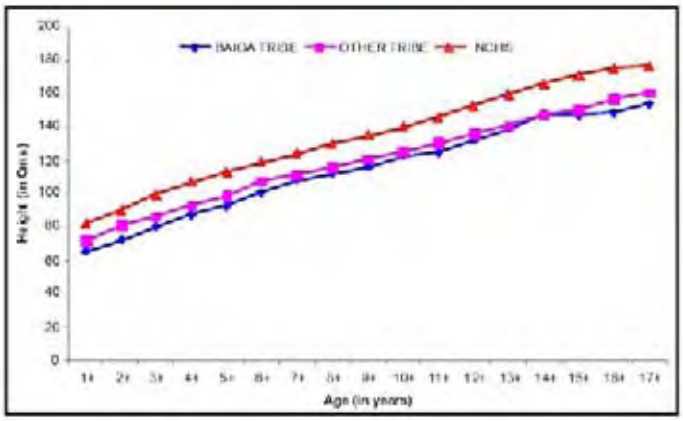


Fig. 4.1.2: Comparison of Height of Baiga Children (Female) with Tribals (NNMB) and NCHS

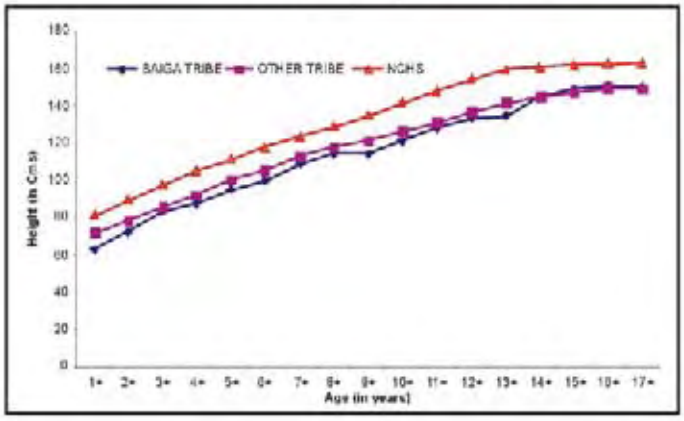


Fig. 4.1.3: Comparison of Weight of Baiga Children (Male) with Tribals (NNMB) and NCHS

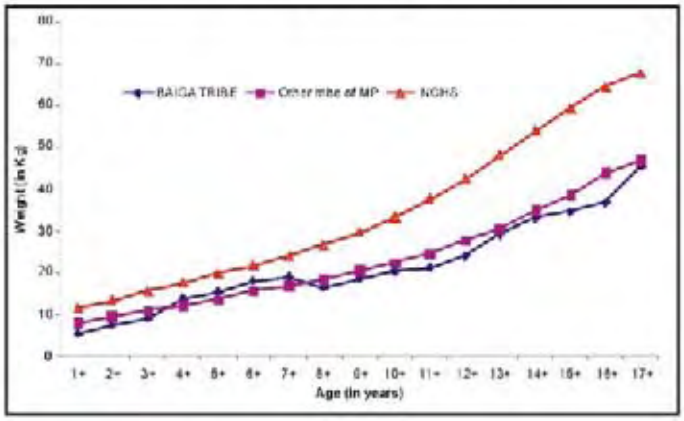
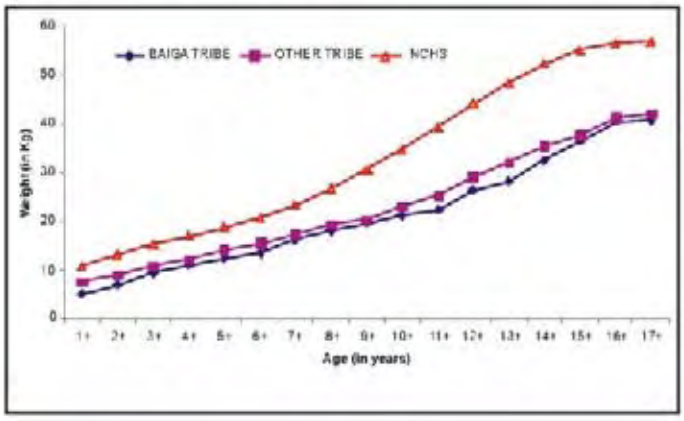


Fig. 4.1.4: Comparison of Weight of Baiga Children (Female) with Tribals (NNMB) and NCHS



4.2. Fluorosis Mitigation: Assessment, Intervention and Impact of Intervention in Fluorosis Affected Villages of Seoni District of Madhya Pradesh

Date of starting	:	January 2010
Duration	:	18 months
Status	:	Ongoing
PI	:	Dr. T. Chakma
Funding	:	UNICEF, Bhopal

India is among the 23 nations around the globe, where fluorosis is a public health problem. An estimated 62 million people in India in 21 out of the 32 states are affected with dental, skeletal and non-skeletal fluorosis. The extent of fluoride contamination of water varies from 1.0 to 48.0 mg/l.

Recent investigations carried out at RMRCT, Jabalpur brought to light the prevalence of severe forms of dental and skeletal fluorosis in an endemic population in the district of Mandla and Dindori in Madhya Pradesh. It also highlighted the rampant prevalence of genuvalgum deformities in this region.

Seoni district which is an adjacent district of Mandla, has been found to contain high fluoride levels in more than 800 villages (Source: PHED Seoni). Lack of any perennial river to provide drinking water further aggravated the fluorosis burden.

Objectives

To asses the severity and magnitude of the fluorosis.

To assess the urinary fluoride level in the sample population.

To assess the nutritional status through dietary survey.

To initiate intervention and analyze its impact.

Methodology

Cross sectional study was carried out in 10 sampled villages of Seoni district. The affected villages were stratified according to the proportion of hand pumps contaminated with fluoride. Only those villages were considered in the study where more than 50% hand pumps are contaminated. Baseline health survey was carried out for assessing the magnitude of the problem through pre-coded and pre tested proforma. Using 24-hour recall method individual's nutrient consumption pattern was assessed in every tenth household. Spot urine samples of those having skeletal malformation and early warring signs were

collected and analyzed for fluoride. To assess the radiological changes for confirming fluorosis, X-ray examination was carried out among a limited number of affected individuals, particularly children. Blood samples were collected for renal function test. All the villages were mapped to identify the contaminated and safe sources in order to help the field workers to guide the villagers to the safe sources. In addition to these intervention also includes supplementation of Iron, Vitamin-C and Calcium.

Findings

A total of 5437 individuals of different ages from 10 selected villages were surveyed for collection of baseline data. Dental fluorosis was noticed among 1032 (18.9%) individuals form the study villages. Genuvalgum or knock knee was seen among 509 (9.3%) individuals from the study population. Skeletal fluorosis was observed among 395 (7.2%) individuals.

About 54% of the study population (2923 individuals) was noted to suffer from various forms of non-skeletal fluorosis such as loss of appetite (11.6%), gas in stomach (13.4%), pain in stomach (16.7), chronic diarrhoea (6.2%) and chronic constipation (5.8%). Other related symptom like chronic headache, frequency of micturition and extensive weakness were also seen among the population. Urine samples were collected from 345 clinically symptomatic individuals. Of these 92.6% (320 samples) were detected with fluoride levels more than 2 ppm.

In total the 85 water samples were collected for estimation of water fluoride, out of which 40 samples showed fluoride level higher than permissible limit i.e. 1.0 ppm. The fluoride content ranged from 0.02 ppm to 11.0 ppm. In village Sargapur all the water sources were contaminated with high fluoride, resulting in no safe source of drinking water in the village. Intervention programme is in progress.



Woman with a skeletal fluorosis



Male with severe knock knee

4.3. Health and Nutritional Status of Sahariya Tribe of Datia District Madhya Pradesh

Date of starting	:	January 2009
Duration	:	1 Year
Status	:	Completed
PI	:	Dr. C K Dolla
Funding	:	Dept. of Tribal Welfare, Govt. of MP

The Sahariyas are one of the most backward and marginalized community in Madhya Pradesh and are classified as one of the primitive tribes. Sahariyas are the predominant tribe in the Datia district with scanty information on their health and nutrition status. The present study was under taken at the request of the State Government of MP.

Objectives

To asses the presence of various morbidities and malnutrition among Sahariyas.

Methodology

The study is descriptive and cross-sectional in nature and data was collected through standard protocol. Twenty-six Sahariya dominated villages were covered in the study. General morbidities were assessed by adopting standard clinical methods. Mortality information was collected using a 12 months recall period. History regarding the antenatal care, post-natal care, contraceptive practices, knowledge of HIV/AIDS and reproductive hygiene were also collected from the eligible respondents. Estimation of haemoglobin was done by Filter Paper Cyanmethemoglobin method. Rapid Diagnostic Test (RDT) kits were used to diagnose malaria. Stool specimens were examined for the presence of diarrheal parasites. Data analysis was performed by SPSS statistical package. Nutritional status has been classified using NCHS standards both in 0-6 age group and 7-18 age groups. The Body Mass Index (BMI) grades were used to assess the nutrition status of adults. In the study 703 subjects were enquired and examined clinically for understanding various morbidities.

Findings

Among 237 children (0-6 years) 35.3% were wasted, similarly 52.6% and 67.9% were stunted and underweighted respectively. The stunting and underweight was more in boys than in girls whereas the wasting was more in girls than boys. Among 133 children in the age group 7-18 years, the wasting was 22.3%, stunting was 48.1% and 59.4% were

underweight. Among adults (>18 years) 48.5% were suffering with chronic energy deficiency (CED) and 27.4% were low weight. Relatively more males had both CED and low weight as compared to females. The CED increases with the increase in the age. Among lactating women, 40.8% were suffering with CED and 32.7% with low weight.

Night blindness was predominantly higher among all signs and symptoms of Vitamin A deficiency detected. Night blindness alone accounted for about 14% followed by conjuctival xerosis (6.5%), Bitots spots (6.2%) and corneal xerosis (3.2%). Incidence of night blindness was highest among pre-school children as compared to school age group children. The prevalence of anemia was about 40% and in general females were comparatively more anemic than males. Incidence of anemia in pre-school children and adolescents were relatively higher as compared to individuals of other age groups. A total of 82 cases of individuals with fever were tested for suspected malaria with Rapid Diagnostic Test (RDT) and 12 cases were found to be positive. Further examination revealed that most of these infections were due to *Plasmodium falciparum*.

Out of 126 stool samples examined, 47% were found to be positive for various parasites. The most prevalent parasitic infection was Tape worm (*Hymenolepsis nana*). The prevalence of Tape worm was 28.8% followed by Hook worm (*Ankylostoma duodenale*) 20.3%, Round worm (*Ascaris lumbricoides*) 18.6%, *Entamoeba histolytica* 15.3%, and Thread worm (*Enterobius vermicularis*) 11.9% in that order. Other frequently reported morbidities are presented in table 4.3.1.

Table 4.3.1: Percent Distribution of Morbidity among male and female of Sahariya Tribe, district Datia

Morbid conditions	Male n=317	Female n=386	Total N=703
Scabies	7.6	4.7	6.0
Fever	11.7	12.2	11.9
Cough	12.0	11.1	11.5
Vit.B-Complex Def.	1.6	2.1	1.8
Chr.Myalgia	6.0	7.0	6.5
Diarrhea	2.2	1.3	1.7
Skin wounds	0.9	0.3	0.6
Folliculitis	0.2	1.3	0.9
NAD	50.1	58.6	54.8

5. SOCIAL AND BEHAVIOURAL STUDIES

5.1. Behaviour and Vulnerability to Reproductive Morbidity Among The Tribal Youths: A Study Among the Sahariyas of Gwalior District of Madhya Pradesh

Date of starting	:	February 2009
Duration	:	2 years
Status	:	On going
PI	:	Dr. K.B. Saha
Funding	:	Dept. of Tribal Welfare, Govt. of MP

National Family Health Survey-3 (2005-06) reported high risk sex behavior among the youths with about 8 to 11% of them having STI symptoms. Rising incidence of unsafe sex among youth thus underlines the need for comprehensive health education. Lack of such knowledge among tribals compounds the issue further.

The primitive Sahariya tribe is a vulnerable population with scanty information on their behavioural dimensions of reproductive morbidity. Hence the present study is an attempt in this direction with the support from Department of Tribal Welfare, Government of Madhya Pradesh. This in-depth study will help in tribe specific microplanning.

Objectives

In the study attempt was made to understand the knowledge, attitude, behaviour and practice about reproductive and sexual matters among the tribal youth and identify the constraints in effective intervention and utilization of health services for prevention and management of reproductive morbidity.

Methods

The study is biphasic wherein phase-I is qualitative that make use of participatory rural appraisal (PRA) tools. This phase of data collection helps in designing and finalization of survey instrument for phase-II, which is a quantitative survey. The study initiated in the year 2009 among the Sahariya youth in the age group 15-24 years residing in Gwalior District of M.P. Samples of 702 youths (both male and female) were interviewed. Written consent was obtained from all the respondents.

Findings

Social and behavioural risk factors

The mean age of the respondents was 20.3±3.12. Fifty nine percent of them were male and 41% were female. Sixty two percent were currently married while 37% were never married. Forty eight percent of them had never attended school and among those studied around 80% had studied up to eighth standards. Most of them (90%) worked as labours mainly in agriculture and stone quarrying. Around 51% worked in their own villages and remaining also move out when required to other villages, urban areas, forest areas etc. for sustenance.

Around 29% (206/702) of the respondents reported that they were proposed by an opposite sex mostly from their own villages for intimate physical relationship and 84% (174/206) had accepted these proposals. All 702 respondents were asked about the places of their secret meeting of youths for intimate relationship and it was found that agriculture / grazing field and market places were most preferred choice.

Further homosexual relationship is known to them as 18% (129/ 702) respondents reported to have knowledge about male to male relationship while 15% (107/702) were aware of female to female relationship.

A miniscule number of the youths/respondents (10/702) had reported sex by force. Among these 4 such respondents experienced sex by force within the preceding 12 months. It was identified that paid sex in the form of sex in exchange for money or gift existed mostly among the females. Among total respondents, 1% reported that they were offered some job in exchange of sex, 5% were offered gift for sex. On the other hand, around 2% of the respondents reported that they offered gift or assurance for better result in the school in exchange of sex. So in total 51 respondents were involved in one or multiple activities mentioned above and in all these relationships 65% (33/51) of them had never used and only 26% (13/51) had regularly used condoms.

Regarding extra marital relationship, 6% respondents reported that such relationship do exist among the males and 5% reported for females. While around 20% respondents reported ignorance of such a practice. Among married respondents, 18% (78/443) reported of having sex before marriage.

Domestic violence in the form of physical abuse of wife was also prevalent among the tribes. The above discussion points to the risky behavior among the Sahariya youths.

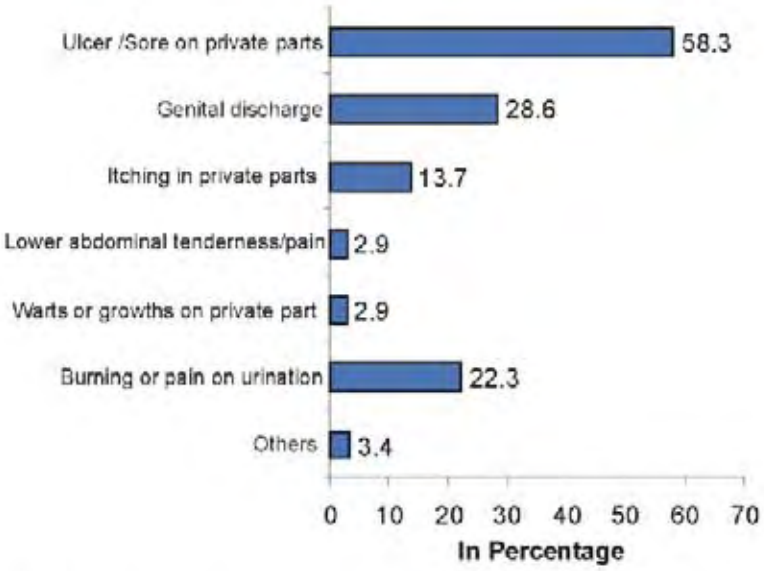
KAP on pregnancy, STI/HIV/AIDS and related symptoms

About 43% of the respondents reported that no woman become pregnant on the very first encounter of unprotected sexual intercourse. On the other hand, 26% of the respondents were totally ignorant about pregnancy due to first physical intimacy. Further 58% of the respondents were also ignorant of chances of conception in the mid of a menstrual cycle. Lack of knowledge about sexual behaviour was evident from the fact that

30% respondents were unaware of whether hugging or kissing would lead to pregnancy. They also supported the idea of termination of unwanted pregnancy. On the issue of medical termination of pregnancy, 23% reported that it was safe to terminate the foetus even after 20 weeks (5 months). Only 13% reported that it is unsafe to terminate a pregnancy after 20 weeks and the remaining 64% lacked any such knowledge.

Forty-five percent (315/702) of respondents had fair knowledge about HIV/AIDS and precautions to prevent contracting HIV/AIDS like avoidance of multiple sex partners and use of condom. In addition to HIV, knowledge of other STI were known to 25% (175/702) of the respondents and associated symptoms are shown in figure 5.1.1.

Fig.5.1.1: Awareness of STI symptoms (N=175)



Around 17% of the total respondents (118/702) reported to have suffered during three months preceding the survey and mentioned various symptoms which are shown in table 5.1.1. Very few among them availed some treatment mostly from private practitioners for the symptoms reported.

Table 5.1.1: Self reported STI symptoms (N=702)

Had symptoms		N (%)
Ulcer /sore in private part	(A)	64(9.1)
Genital discharge	(B)	15(2.1)
Itching in private part	(C)	5 (0.7)
Burning or pain on urination	(D)	5 (0.7)
A+B		17 (2.4)
A+C		5 (0.7)
A+D		1 (0.1)
B+C		1 (0.1)
A+B+C		4 (0.6)
B+C+D		1 (0.1)

NB: symptoms reported during 3 months preceding the survey.

Constrains in effective intervention and utilization of health services for prevention and management of reproductive morbidity

Ignorance and misconception guides the reproductive and sexual behaviour of Sahariya youths:

- Most of the youths do not consider the sexual intercourse (53%; 374/702) as a risk factor for transmission of any disease. Overall, the awareness to STI is poor.
- Poor knowledge of contraception, particularly that of spacing methods (32%; 224/702). Seventy percent of Sahariya youths were aware of condom but there exist a number of misconceptions among them regarding its effectiveness.
- Youths felt shy to collect contraceptives (24%; 166/702) from health care provider (HCP) and also from medical shops.

Government health services were not preferred by the tribe (86%; 603/702). The main reasons reported were: time not suitable (7%), health centre not accessible (17%), private treatment easy and effective (76%), Govt. medicine relatively ineffective (34%) and non cooperation by the staff (11%). To improve the condition respondents felt need of regular health services in their villages (45%), improvement in the quality of Govt. health services (49%), make health services free of cost (48%), kind behaviour of the staff (31.3%), and importance of Govt. health services (18%).

5.2. Prevalence of Infertility in India

Date of starting	:	February 2009
Duration	:	2 years
Status	:	On going
PI	:	Dr. K.B. Saha
Funding	:	ICMR

Community based data on prevalence of infertility has been scarce in India and the available data is very much sporadic. So, ICMR has taken up a multi-centric task force study in twelve Indian states. Under this task force study RMRCT is carrying out the survey in the state of Madhya Pradesh.

Objective

To study the prevalence, reported risk factors, treatment seeking behaviour and psychological consequences of infertility.

Methodology

Survey is being undertaken in two randomly selected districts. Ever married woman (EMW) in the age group 15-44 years were interviewed by canvassing a set of pre-designed interview schedules. The minimum estimated sample size is 2700 EMW.

Findings

So far, the survey has been completed in rural and urban areas of the district Jabalpur and a total of 1726 women have been interviewed. The estimates of the data generated from the district Jabalpur reveals that infertility is higher in urban areas (6.13%) compared to the rural areas (2.54%). The total infertility in the district is around 3.59%. Primary infertility was lower (1.56%) compared to secondary infertility (2.03%) (Table 5.2.1). The survey is in progress in the district of Narsingpur, M.P.

Table 5.2.1: Percentage of infertility reported in Jabalpur, M.P.

Rural/ Urban	Ever married women interviewed	Infertility in percentage (%)		
		Total infertility	Primary infertility	Secondary infertility
Total	1726	62 (3.59)	27 (1.56)	35 (2.03)
Urban	506	32 (6.13)	11 (2.17)	21 (4.15)
Rural	1220	30 (2.54)	16 (1.31)	14 (1.15)

5.3. Determinants of Utilization of Maternal Health Care Services among the Primitive Baiga Tribe of M.P.

Date of starting	:	September 2009
Duration	:	2 years
Status	:	On going
PI	:	Dr. Dinesh Kumar
Funding	:	Dept. of Tribal Welfare, Govt. of MP

Promotion of maternal health among tribal population is of atmost importantance for reducing the risk of the life of mothers and newborn. The research regarding maternal health care utilization among tribal communities has assumed importance in India due to high maternal and child morbidity and mortality. It is a major challenge in the tribal areas as majority of child births occur at home and are often assisted by untrained personnel. Thus comprehensive research studies pertaining to maternal health care and its attributing factors among tribal population are important.

Objective

To examine the knowledge, perception and utilization of health services among the Baiga tribe.

Methodology

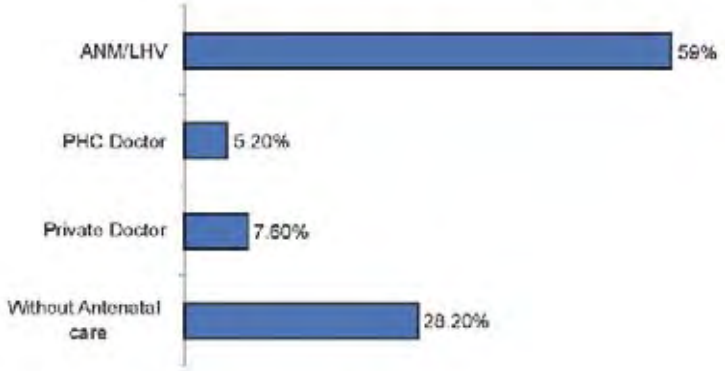
A cross- sectional community based household survey is being carried out among Baiga Primitive tribe in Dindori district of M.P. Ever married women in the age group 15-49 were considered for an interview. Probability proportion to size sampling procedure was adopted for sampling the Baiga villages. Ethical clearance was obtained from RMRCT institutional ethics committee and written consent was acquired from study individuals. Household census was carried out in the study villages. Information was collected through a structured interview schedule by trained investigators. Four hundred sixty households from 24 villages in Dindori District of Madhya Pradesh covering 498 ever married women were surveyed. The total household population so far covered is 2258.

Findings

The average household size was 4.9 persons. Majority of the population lived as nuclear families (74%). The source of safe drinking water is important because waterborne diseases including diarrhea and dysentery are prevalent in tribal areas. It was found that about 30% of households use drinking water from stream/river. The present findings are

based on a sample of 380 women who experienced maternity during last five years. Sources of the maternal health care utilization are shown in figure 5.3.1.

Fig.5.3.1: Sources of Antenatal Care



Majority of the women received first antenatal checkup during second trimester of their pregnancy (43%) mainly due to lack of awareness. Consumption of IFA tablets and T.T. immunizations was reported by 68% and 76.3% women respectively. Delivery at home is the usual practice and only 8% deliveries were conducted at health Institutions. The mean age at delivery of first birth was 19 years. About 84% home deliveries were assisted by untrained health personnel while that by ANM/LHV was 7.9%. This is important to note that about two-third ever married women were not aware of maternal health services while one-third women were aware but could not utilize the services due to poverty, inaccessibility, etc. Further knowledge of maternal health care services is higher (odd ratio r=1.11) among women who delivered a birth in last five years compared to those who do not delivered during the same period (Table 5.3.1). Furthermore, only 15.2% women knew about the danger sign of pregnancy. There is need to develop a micro level strategy for intervention program on empowering the women for better utilization of maternal health care services. The study is under progress.

Table 5.3.1: Women's knowledge of maternal health care services

Ever Married Women	Knowledge of MHC services			Odd Ratio
	Yes	No	Total	
Delivered during last five years	128 (33.7%)	252 (66.3%)	380	
Not delivered during last five years	37 (31.4%)	81 (68.6%)	118	1.11
Total	165 (33.1)	333 (66.9%)	498	

5.4. Newborn Care among Tribes of Madhya Pradesh: A Case Study of Bhils of Dhar District

Date of starting	:	December 2007
Duration	:	2 years
Status	:	Completed
PI	:	Dr. R K Sharma
Funding	:	Intramural

Madhya Pradesh has an Infant mortality rate of 69.5 per 1000 live births, higher than the national average (57.0), and neonatal deaths (NNR = 44.9) comprise approximately 65 percent of infant mortality. Among the scheduled tribes of the state, the infant mortality was 95.6 per 1000 live births and neonatal mortality was 56.5 (NFHS-3, 2005-6). However, very few attempts have been made to study the newborn care practices in the state, particularly among tribal population.

Objective

To investigate the socio-cultural practices related to newborn care and the prevalence of early childhood morbidities (reported symptoms). To study the treatment seeking behaviour of Bhils of Dhar district.

Methodology

A cross-sectional survey was carried out in 60 Primary Sampling Units (PSU) selected through probability to population size (PPS) sampling technique. The estimated minimum required sample was 1000 recently delivered women (RDWs) – women who delivered a live birth in two years preceding to the date of survey. From each selected village about 15-20 RDWs were selected randomly. Overall 1049 RDWs out of 1047 selected households were successfully interviewed during Jan. 2008 – Dec. 2009.

Findings

The mean age of interviewed RDWs was about 25 years and majority of these women were married before attaining the legal marital age. Often Illiteracy, especially among the females was widespread in these tribes. The study also revealed that only about 24% Bhil women could read or write as compared to 48% their spouses.

Pregnancy Care

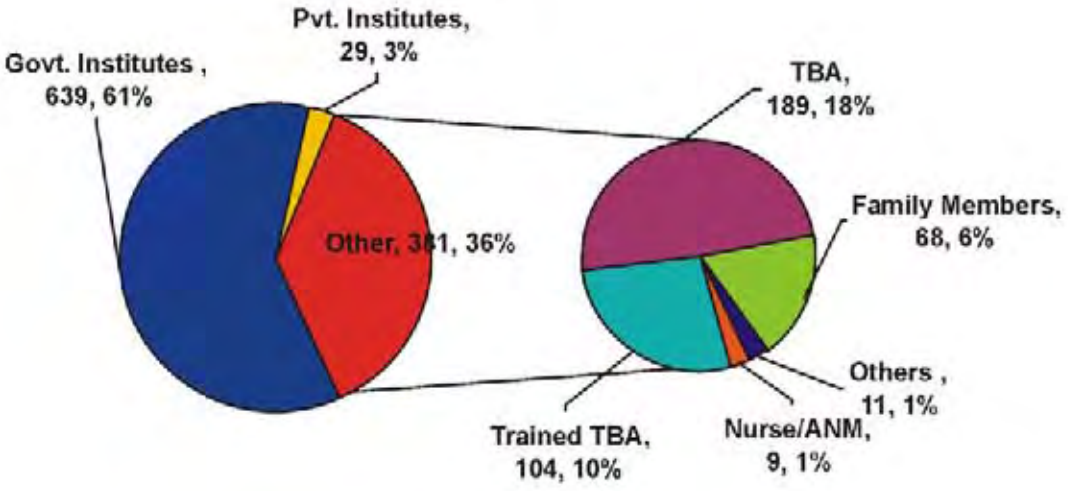
The coverage of antenatal coverage in the study population is almost at par with state average. About 89% women received at least one ANC during their last pregnancy.

However, only 48.6% of them received the recommended three or more ANCs. Often ANCs comprise of weight measurement (60.9%) and abdominal examination (45.9%). In addition, blood tests (30.3%) and blood pressure examination (26.6%) were followed in more than one-forth ANCs. Only 13% women received the recommended 90+ IFA tablets, and among them only 10% utilized the IFA tablets. About two-third of them reported that they were enrolled at an ICDS centre (*Anganwadi centres,* AWCs) but only one-third of them received any supplementary food stuff from these centers. Thus indicating the poor coverage of Integrated Nutrition and Health Programme (INHP) in tribal areas.

Delivery Care

It was observed that increasing number of Bhils are utilizing the facilities of institutional deliveries. About 64% of deliveries that were occurred at health centers and majority of these deliveries were conducted at government health facilities (60.9%). The rising proportion of institutional deliveries may be due to government monetary incentive programme '*Janani Suraksha Yojana* (JSY)'. More than half of the non-institutional deliveries were conducted by untrained *dais* (Fig. 5.4.1). Moreover, in non-institutional deliveries, healthy hygiene practices like, use of soap to wash hands, use of new blade and thread to cut and tie the umbical cord were being followed.

Fig. 5.4.1: Place of delivery and Persons conducted home deliveries



Post-partum Care

Only 41% women reported that they received any postpartum checkup. The visit of health workers during post-partum period is also important for identification and management of post-delivery complications. About 26% women were visited by ANM and 31.2% by AWW for post delivery care. Abdominal examination (52.2%), advises related to newborn care (46.9%) and breast feeding (38.7%) were the main components of postnatal checkups. Among the women receiving post-partum care only 20% women had received internal examination (p/v) and about 24% received advises on family planning.

Newborn Care

As a safe and healthy practice it is essential to clean and wrap the newborn baby within an hour of birth. As can be seen from table 5.4.1 it was observed that only 8.9% and 10.2% babies were dried and wrapped immediately after the birth or before delivery of placenta. Further, about 42% babies were given first bath within six hours, mostly within the first hour after birth. It is noteworthy that about 23% women applied "some substance" to the cord after cutting, which is contrary to WHO recommendations. While 45% women applied some substances after cord fell off. Further, it was noted that only 59% of these women feed colostrums to their babies. Moreover, only 33% women put their baby to breastfeeding within 24 hours (Table 5.4.1).

The practice of offering pre-lacteals to babies is very common, it was ascertained that more than 70% women gave some pre-lacteals mainly '*gur pani*' (54.9%) to their newborn before initiating breastfeeding. Notably, about half of the children were exclusively breastfed for less than six months (Table 5.4.2). Among the commonly reported health problems of newborn, fever (14.6%) and diarrhea (8.8%) were two major health problems of newborn in the present study population and majority of them sought medical treatment.

Though the utilization of maternal and child health services has considerably improved among the tribes, however, there is a need to improve the quality of services. Overall the study reflects that there is imperative need for promotion of healthy newborn care practices among Bhil community.

Table 5.4.1: Newborn care practices among Bhils women

Items	Percent
Very first thing did with baby	
Cord cutting	57.2
Left alone	21.8
Baby was dried	
Immediately/before placenta delivered	8.9
After placenta delivered (within 1 hr)	84.5
Baby was wrapped	
Immediately/before placenta delivered	10.2
After placenta delivered (within 1 hr)	76.4
Baby bathed for first time	
Within 6 hours	42.4
First day (after 6 hrs)	7.9
Later	49.7
Applied some substance after cord cut ting	23.4
Applied some substance after cord fell off	44.9

Table 5.4.2: Breastfeeding practices among Bhils

Items	Percent
Feed Colostrums	59.2
Pre-lacteals	
Sugar water (*Gur pani*)	54.9
Plain water	8.0
Other liquid	5.7
Baby was breastfeed	
Within 24 hours	33.0
On 3rd day or later	46.1
Exclusive breastfeeding (EBF)	
Still on EBF	29.5
< 6 months EBF	46.3
> 6 months	24.2

6. TRANSLATIONAL RESEARCH OUTCOMES

6.1. An epidemic investigation of *Plasmodium falciparum* Malaria was carried out in Baiga chak of Dindori district of Madhya Pradesh. For details refer to study 2.1. On the basis of findings of the study the area was chosen for malaria control in collaboration with State Vector Borne Disease Control Programme (SVBDCP). The recommended intervention measures were implemented by state health authorities. Evaluation of intervention measures is ongoing.

6.2. An epidemic investigation of malaria was carried out in worst affected villages of Birsa and Baihar Community Health Centers on the border of Chhattisgarh state. For details refer study 2.1 in vector borne disease section. The findings of the study helped the SVBDCP in targeting this area for malaria control. On the basis of RMRCT recommendations insecticide treated bed nets were sanctioned for these CHCs. Monitoring and evaluation of malaria intervention measures are ongoing.

6.3. A comparative evaluation of commercially available Rapid Diagnostic Tests (RDTs) for Pv and Pf malaria in comparison with the traditional and molecular techniques was carried out at the centre. For details refer study 2.2 in vector borne disease section. The findings of the study will assist in direct product comparisons and that would enable the policy makers and programme managers in making procurement decisions that would ultimately encourage improvement in the quality of manufacturing.

7. REGULAR ACTIVITIES

7.1. Sickle Cell Clinic

Regional Medical Research Centre for Tribals (ICMR) offers the facilities for diagnosis of haemoglobinopathies to the patients of N.S.C.B. Medical College, Jabalpur and other public sector hospitals of the area. The public sector hospitals lack facilities for such investigations. Since inception till March 2010 a total of 951 persons/patients suspected to be suffering from hemolytic anaemia were referred for haemoglobinopathies. One hundred forty persons were identified as sickle cell disease, 182 as sickle cell trait, 9 as β-thalassaemia trait, 17 as β-thalassaemia major, one case of Hb E (homozygous) and one case of haemoglobin E trait. All patients and their parents were offered counseling. Among 16 suspected persons referred to RMRCT for screening for G6PD deficiency, one person was identified with G6PD deficiency.



Doctor examining the patient for spleenomagaly at Sickle cell clinic

7.2. Integrated Counseling and Training Centre (ICTC)

ICTC unit is functional in the centre. In year 2009 alone 1525 individuals were tested for HIV as per NACO guidelines. Of these, 222 (14.5%) individuals tested positive for HIV antibodies.

7.3. State Reference Laboratory (SRL) for HIV

Centre is recognized as SRL for HIV testing. The main function of SRL is to ensure that External Quality Assurance Scheme is carried out properly. Presently 55 ICTC's and 28 blood banks are linked to this SRL. Samples are received from these units once in a quarter for retesting. Panel sera received from the National Reference Laboratory is distributed to these centres twice a year for blind testing.



Testing for HIV

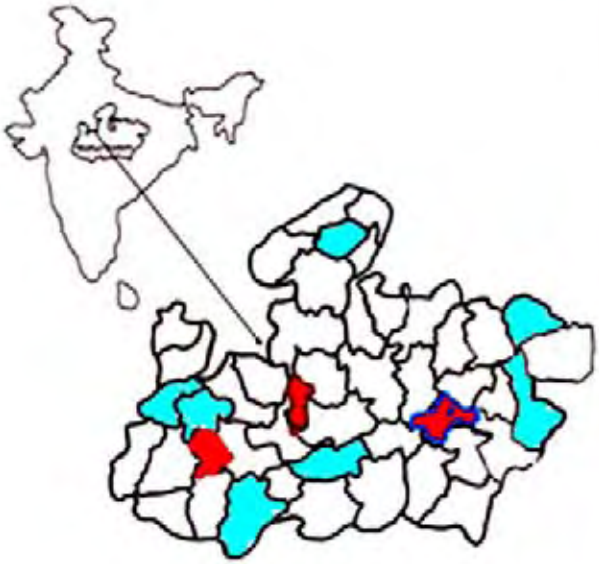
7.4. National Nutrition Monitoring Bureau, MP Unit

National Nutrition Monitoring Bureau (NNMB) Madhya Pradesh Unit is functioning from this Institute since 1987 covering both Madhya Pradesh & Chhattishgarh states. For the year 2009-2010 "Assessment of Diet and Nutritional Status of Rural Population & Prevalence of Hypertension & type II Diabetes Mellitus among Adults (≥18 Years): A Third Repeat Survey" has been planned to be executed by the steering committee. Under this a total of 2400 households from 120 villages are selected from Madhya Pradesh and Chhattishgarh for survey including demographic particulars, anthropometric measurements, dietary Intake Information (24 Hrs Recall Method), recording of BP and estimation of fasting blood sugar etc. So far about 35 villages have been covered and the data has been send to NIN central laboratory for analysis.

7.5. Establishment of New Laboratory

Swine Flu (H1N1P) Testing Laboratory

In view of global pandemic of swine flu, a testing facility for swine flu (H1N1P) diagnosis laboratory was established at this centre and the testing started at the end of October 2009. Using WHO protocol for real time RT PCR, till March 2010, 497 samples were tested. Out of those tested 95 were found to be positive for H1N1 P virus. Maximum samples (200 nos.) were received during in the month of January 2010. It was noted that adults in the age group of 18-60 were most affected.



Map of MP showing affected areas 2009-10





H1N1P testing in the laboratory

Significantly no difference in infection patterns in male or females was detected. The samples were received from 10 districts (marked in blue and red color in the map). City of Indore was most affected with 52 cases followed by Jabalpur (20) and Bhopal (12) and these are marked in red. Fifty-three seasonal flu (only influenza A) cases were also detected during these investigations. H1N1P infection data suggested that although in Madhya Pradesh the numbers of cases were not as high as Maharashtra, Delhi and Karnataka, the percent positivity (19.3%) of samples referred to the laboratory was similar to that of national average. However, this data only represents samples from 10 districts out of 50 districts in Madhya Pradesh.

7.6. Library

The library of RMRCT continues to cater the documentation and information needs of the scientists and other research staff of this Centre as well as other institutes like NSCB Medical College, Veterinary College, Home Science College, Rani Durgawati Vishwavidyalaya, etc. It also extends services to research personnel from other Universities / Institutes of National and International standard.

Library is equipped with modern furniture, air-conditioners, compactors and display racks for display of latest periodicals for its reading rooms. Library is member of consortium

of National Medical Library, New Delhi (J-Gate@ERMED). Library is also member of E-J Server provided by Total IT Solutions, New Delhi which has access to 595 E-Journals, 313 E-Books. Photocopies of available literature are also provided for personal use. A photocopying operator has been engaged in the library to provide the service at nominal rate. The library has the following resources :

New additions (Apr 2009-Mar 2010)	
Books / Journals	79
Subscribed Periodicals 1. International Periodicals 2. Indian Periodicals	 41 21
Total Library Collection	**3686**
Books	1213
WHO Publications	619
Bound Foreign Journals	1114
Bound Indian Journals	740
MEDLINE CDs	21
Other CDs	26
Census Floppies	60
Member of Following Consortia	
E-Journals	21
www.nmlermed.in	1516
Total IT E_J_Server	E-Journals 595
Total IT E_J_Server	E-Books 313
Total IT E_J_Server	Databases 20





7.7. Human Resource Development

The centre and its scientists are recognized by the Rani Durgawati Vishwavidyalaya, Jabalpur for guiding research work leading to Ph.D. degree. This year fourteen students from various universities/institute completed their M.Sc. dissertation under the able guidance of the scientists of the centre. Four students are pursuing their Ph.D thesis work in this centre.

7.8. RMRCT Publications



(a) Tribal Health Bulletin

Centre published a biannual and bi-lingual Tribal Health Bulletin, that carries published peer reviewed articles related to various health issues. This year vol.13 no. 1&2 has been published.



(b) RMRCT Update

Centre also published its biannual RMRCT Update highlighting the regular activities of the Centre. This year vol.6 no.2, 2009 & vol. 7 no. 1, 2010 have been published.

8. PUBLICATION OF RESEARCH PAPERS IN JOURNALS

1. Bharti PK, Alam MT, Boxer R, Shukla MM, Gautam SP, Sharma YD, Singh N. Therapeutic efficacy of chloroquine and sequence variation in pfcrt gene among patients with falciparum malaria in central India. Trop Med Int Health. 2010 Jan; 15(1):33-40.

2. Bhat J, Rao VG. Gopi PG, Yadav R, Selvakumar N, Wares DF. 2009. Prevalence of pulmonary tuberculosis amongst the tribal population of Madhya Pradesh, central India. Int J of Epide. 2009 Aug; 38(4):1026-32.

3. Hamer DH, Singh MP, Wylie BJ, Yeboah-Antwi K, Tuchman J, Desai M, Udhayakumar V, Gupta P, Brooks MI, Shukla MM, Awasthy K, Sabin L, Mac Leod WB, Dash AP, **Singh N**. 2009. Burden of malaria in pregnancy in Jharkhand State, India. Malar J. Sep 3; 8: 210.

4. Jain V, Singh PP, Silawat N, Patel R, Saxena A, Bharti PK, Shukla M, Biswas S, **Singh N**. A preliminary study on pro- and anti-inflammatory cytokine profiles in *Plasmodium vivax* malaria patients from central zone of India. Acta Trop. 2010 Mar; 113(3):263-8.

5. Lumb V, Das MK, **Singh N**, Dev V, Wajihullah, Sharma YD. Characteristics of genetic hitchhiking around dihydrofolate reductase gene associated with pyrimethamine resistance in *Plasmodium falciparum* isolates from India. Antimicrob Agents Chemother. 2009 Dec; 53(12):5173-80.

6. Mixson-Hayden T, Jain V, McCollum AM, Poe A, Nagpal AC, Dash AP, Stiles JK, Udhayakumar V, **Singh N**. Evidence of selective sweeps in genes conferring resistance to chloroquine and pyrimethamine in *Plasmodium falciparum* isolates in India. Antimicrob Agents Chemother. 2010 Mar; 54(3):997-1006.

7. Rao VG, Anvikar A, Savargaonkar D, Bhat J, Yadav R, Tiwary BK, Abbad A. 2009. Prevalence of sexually transmitted disease syndromes in tribal population of central India. J Epidemiol Community Health. 63; 10:805- 6.

8. Rao VG, Anvikar A, Savargaonkar D, Bhat J. Sexually transmitted infections in tribal population of central India. Eur J Clin Microbiol Infect Dis (in press).

9. Rao VG, Bhat J, Gopi PG, Yadav R, Selvakumar N, Wares DF. Yield of PTB cases by symptoms amongst the tribal population of central India. Natl Med J India (in press).

10. Rao VG, Bhat J, Yadav R, Gopi PG, Selvakumar N, Wares DF. Pulmonary Tuberculosis among Bharia - a primitive tribe of Madhya Pradesh. Int J Tubercul Lung Dis. 2010 Mar; 14(3):368-70.

11. Rao VG, Gopi PG, Bhat J, Selvakumar N, Yadav R, Tiwari BK, Gadge V, Bhondeley MK, Wares DF. Pulmonary tuberculosis: a public health problem amongst Saharia, a primitive tribe of Madhya Pradesh, central India. Int J Infect Dis (in press).

12. Rao VG, Gopi PG, Bhat J, Yadav R, Wares DF. 2009. Role of BCG vaccination in Tuberculosis control. Curr Sci. 96; 10:1307-1308.

13. Singh N, Dash AP, Thimasarn K. 2009. Fighting malaria in Madhya Pradesh (Central India): are we losing the battle? Malar J. May 7; 8:93.

14. Singh N, Shukla MM, Gyanchand, Bharti PK, Singh MP, Shukla MK, Mehra RK, Sharma RK, Dash AP. Epidemic of Plasmodium falciparum malaria in central India, an area where chloroquine is replaced by artemisinin-based combination therapy. Trans R Soc Trop Med Hyg. 2010 (in press).

15. Singh N. A new global malaria eradication strategy: implications for malaria research from an Indian perspective. Trans R Soc Trop Med Hyg. 2009 Dec; 103(12):1202-3.

16. Yadav R, Rao VG, Bhat J, Gopi PG, Selvakumar N, Wares DF. Tuberculosis prevalence among Baiga primitive tribe of Madhya Pradesh. Indian J Tuberc. (in press).

17. Yadav R, Rao VG, Bhat J, Gopi PG, Wares DF. Annual risk of tuberculosis infection amongst the tribal population of Jhabua district, Madhya Pradesh. Indian Pediatr (in press).

9. CONFERENCE/WORKSHOP/MEETING ATTENDED

Dr. Neeru Singh

- Attended meeting regarding health impact assessment under Narmada irrigation project in Bhopal on 4th April 2009.
- Attended meeting on Brainstorming Session on Research Data Repository & Clinical Data Management at ICMR Delhi on 19th May 2009.
- Delivered lectures on 'Tribal Malaria Control' in a training course for DMOs, Biologists and senior health officers of Gujarat state on 4th and 17th June 2009 at NIMR Delhi.
- Attended a meeting on 'Consultation on malaria elimination' at NIMR Delhi on 25th June 2009.
- Delivered lectures on 'Tribal malaria control - a success story' in a training Course organized by NIMR for DMOs, Biologists, Entomologists and Sr. Officers of Gujarat on Prevention and Control of Vector Borne Diseases at NIMR Delhi on 1st, 22nd and 28th July 2009.
- Attended international conference on 'Medicine Advancement in Last 10 Years' at Department of Medicine, Shri Ram Murti Smarak Institute of Medical Sciences, Bareilly on 2nd – 4th October 2009 and delivered a lecture.
- Attended International conference on 'Current Trends in Advanced Biomedical Technology (CTAB-2009)' at Department of Microbiology & Biotechnology, Nehru Arts and Science College Coimbatore on 14th and 15th October 2009 and delivered plenary lecture on 'Recent Advances in Biotechnology with special reference to Malaria'.
- Attended Public Health Foundation of India (PHFI) meeting on 'Expert consultation on Disease control in India', at New Delhi on 26th-28th October 2009.
- Attended X International Symposium on Vectors and Vector Borne diseases organized by Goa University and National Institute of Malaria Research at Goa during 4th-6th November 2009 and delivered a lecture.
- Attended a workshop "WHO Collaborating Centres in India" at New Delhi organized by WHO on 12th & 13th Nov 2009.
- Attended 58th Annual Meeting of the American Society of Tropical Medicine and Hygiene (ASTMH) from 18th-22nd Nov 2009 in Washington D.C., USA and presented a paper.

Dr. RS Balgir

- Attended the National Workshop on Tribal Health: Status, Challenges and Possibilities, organized by Tribal Research and Development Institute, Bhopal on 18th December 2009.
- Presented papers in the Symposium on "Relevance of Human Genome Study in Biological Anthropology in India" organized by Indian National Confederation and Academy of Anthropologists (3rd Congress) held during 21st -23rd February 2010 at Indira Gandhi Rashtriya Manav Sangrahalaya, Bhopal.

Dr. VG Rao

- Attended a Symposium on "Tuberculosis: Trends, Challenges and Solutions" at Bhopal Memorial Hospital and Research Centre, Bhopal on 22nd May 2009.
- Presented a paper in Research Dissemination Workshop – III, Jointly Organized by Tuberculosis Research Centre (ICMR) & World Health Organization) at Chennai on 9th and 10th December, 2009.
- Presented a paper in 64th National conference on Tuberculosis & Chest Diseases (NATCON 2009) held at Kolkata during 26th -29th December 2009.

Dr. KB Saha

- Attended Expert and Investigators Meet on the project Prevalence of Infertility in India on 29th and 30th October 2009 at National Institute of Nutrition, Hyderabad.

Dr. Jyothi T Bhat

- Attended a Symposium on "Tuberculosis: Trends, Challenges and Solutions" at Bhopal Memorial Hospital and Research Centre, Bhopal on 22nd May 2009.
- Delivered a lecture on 'Laboratory diagnosis of HIV and CD4 testing' in the training of Medical officers for Community care centre's of HIV, organized by NACO at NSCB Medical College, Jabalpur on 7th July 2009.
- Attended training on DBS specimen collection and transportation organized by MPSACS at Gandhi Medical College, Bhopal on 19th August 2009.
- Attended training on Laboratory Techniques for diagnosis of STI's/RTI's at state regional centre, GMC, Nagpur on 18th & 19th January 2010.
- Attended Sir Dorabji Tata Symposium on Newer diagnostics at SDTC, Bangalore on 10th & 11th March 2010.
- Attended a meeting for the project 'Epidemiology of viral hepatitis in tribal population of M.P., Chattisgarh, Orissa & Jharkahand' at NIV, Pune on 25th March 2010.

Dr. Pradip Barde

- Attended Sir Dorabji Tata Symposium on Newer diagnostics at SDTC, Bangalore on 10th & 11th March 2010.
- Delivered a lecture on "Effect of climate change on vector borne diseases" at EPCO organized meeting on climate change held at Bhopal, on 7th July 2010.

Dr. Rajiv Yadav

- Dr. Rajiv Yadav presented a paper in 64th National Conference on Tuberculosis & Chest Diseases (NATCON 2009) held at Kolkata during 26th -29th December 2009.

10. EVENTS

10.1. Independence Day and Republic Day Celebrations

The centre celebrated 63rd Independence Day on 15th August 2009 and 61st Republic Day on 26th January 2010 with great enthusiasm. Dr. Neeru Singh, Director of the centre hoisted the National Flag at main Building of the centre.



Flag hoisting

10.2. Hindi Fortnight (14th to 28th September 2009)

On the occasion an appeal was made by the Director to all officers and staff of the Centre to do their official work as much as possible in Hindi. Various competitions were organized at the centre to promote working in Hindi among the employees. The winners of the competitions were presented with cash prizes and certificates by Director of the centre.



Dr. Jyothi Bhatt, Scientist 'C' collecting the prize from the Director

10.3. Foundation Day

The centre celebrated it's Foundation Day on 6th March 2010. Dr. N. K. Ganguly, Ex- Director General ICMR delivered the foundation day lecture.



On the dias (from L to R) Dr. Neeru Singh, Dr. D. Sharma, Dr. N.K. Ganguly, Dr. Nagpal

10.4. Foundation Stone of New Guest House

Lt. Gen. D. Raghunath, Principal Executive, Sir Dorabji Tata Centre for Research in Tropical Diseases, Bangalore laid Foundation Stone of new Guest House on 3rd December 2009.



Lt. Gen. D. Raghunath unveiling the foundation board

10.5. Scientific Advisory Committee

22nd Scientific advisory committee meeting was held on 3rd and 4th December 2009.



SAC meeting in progress

10.6. Vigilance Week (3rd to 7th November 2009)

National vigilance week was observed during 3rd – 7th November 2009 to engender awareness among the employees for sincere and dedicated service free from corruptions. Oath was also taken by all employees of the centre not to indulge in corrupt practices.



Dr. Neeru Singh, Director read out the oath

10.7. Press Conference on Swine Flu

A Press Conference on Swine Flu (H1N1P) was organized on 18th December 2009 at RMRCT Jabalpur. The Centre and Joint Director of Health Services Jabalpur organized the Conference jointly.



Dr. Neeru Singh and Dr. V.G. Rao speaking during press conference

11. APPENDICES

11.1. Joining/Promotions/Retirement

Joining

- Dr. R.K.Sharma joined as Scientist 'C' on 21.12.2009.
- Dr. Jyothi Bhat joined as Scientist 'D' on 21.01.2010.
- Dr. Pradip Barde joined as Scientist 'C' on 22.02.2010.
- Dr. Pravin Kumar Bharti joined as Scientist 'C' on 16.03.2010.
- Mr. Narendra Kumar Jharia joined as Hindi typist on 05.01.2010.
- Mr. Ramanuj Kumar joined as Technician 'B' on 22.06.2009.

Promotions

- Mr. Gyan Chand Jain was promoted as Administrative officer on 11.09.2010.
- Mr. D.P. Lodhi was promoted as Section officer on 17.02.2010.
- Mr. P.K. Bhalerao was promoted as Section officer on 31.03.2010.
- Mr. Baisakhulal was promoted as Upper Division Clerk on 30.07.2009.
- Smt. Pushpa Umate was promoted as Assistant on 30.07.2009.

Retirement

- Mr. W.H. Venkat Seshan retired from the post of Administrative Officer on 31.07.2009.
- Mr. B.K.Mazumdar retired from the post of Accounts officer on 31.01.2010
- Mr. R. N. Dubey took voluntary retirement from the post of Upper Division Clerk on 02.02.2010.
- Mr. S. K. Vinodia imposed compulsory retirement from the post of Assistant on 25.09.2009.

11.2. Foreign Visits

- Dr. Neeru Singh visited Washington D.C., USA to attend the 58th Annual meeting of the American Society of Tropical Medicine and Hygiene (ASTMH) during 18th – 22nd Nov 2009 and presented a paper.
- Dr. C.K. Dolla, visited Royal Tropical Institute, Netherlands during 2nd - 11th September 2009.
- Dr. S. R. Qamra, attended 16th World Congress of the International Union of Anthropological and Ethnological Congress at Yunnan University, China during 27th – 31st July 2009 and presented a paper.

11.3. Visits

Shri A. K. Shrivastava, IAS Commissioner Jabalpur and Shri Hariranjan Rao, IAS Collector Jabalpur visited the centre on 30th January 2010.



11.4. Workshops / Training / Meeting conducted

Five days refresher training was conducted in collaboration with MPSACS for laboratory technicians of ICTC in two batches from 23rd to 27th June and 29th June to 3rd July 2009. Thirty technicians were trained during the period.



District Collector, Jabalpur organized a review meeting to assess the performance of Revised National Tuberculosis Control Programme on 3rd June 2009 at RMRCT auditorium.



District Collector, Jabalpur organized a lecture on Time Management for the state Government officials at RMRCT auditorium on 9th September 2009.

Collector Jabalpur organized a review meeting to assess the progress of RCHII/ NRHM and other National Programs for the year 2009-10 at RMRCT on 9th October 2009. Dr. J. L. Mishra, Chief Medical and Health Officer/ Secretary, District Health Society, Jabalpur also delivered lecture.



Three training workshops on vector borne diseases for Medical Officers of various districts of Madhya Pradesh were organized during 21st to 23rd December 2009, 6th to 8th January 2010 and 25th to 27th March 2010 jointly with NIMR FS Jabalpur and Directorate of Health Services.



A workshop on Integrated Fluorosis Mitigation: Awareness for General Practitioner and Pathologists of endemic districts of Madhya Pradesh was organized on 28th March 2010. The Workshop was organized jointly by RMRCT Jabalpur and IMA Jabalpur Branch and sponsored by UNICEF Bhopal.



A workshop on Tuberculosis was organized on 28th March 2010 at RMRCT Jabalpur.



11.5. Award

Dr. R. S. Balgir

Received "BGRC Silver Jubilee Oration Award 2006" of Indian Council of Medical Research (ICMR), New Delhi, in the field of Public Health Genetics and Community Haemoglobinopathies on 18th September 2009 at New Delhi.

Dr. K. B. Saha

Received 3rd prize in the "Hindi Essay Competition" organized by Town Official Language Implementation Committee, Govt. of India at G.C.F., Jabalpur on the occasion of the Golden Jubilee meeting of the committee on 24th July 2009.

11.6. Committees

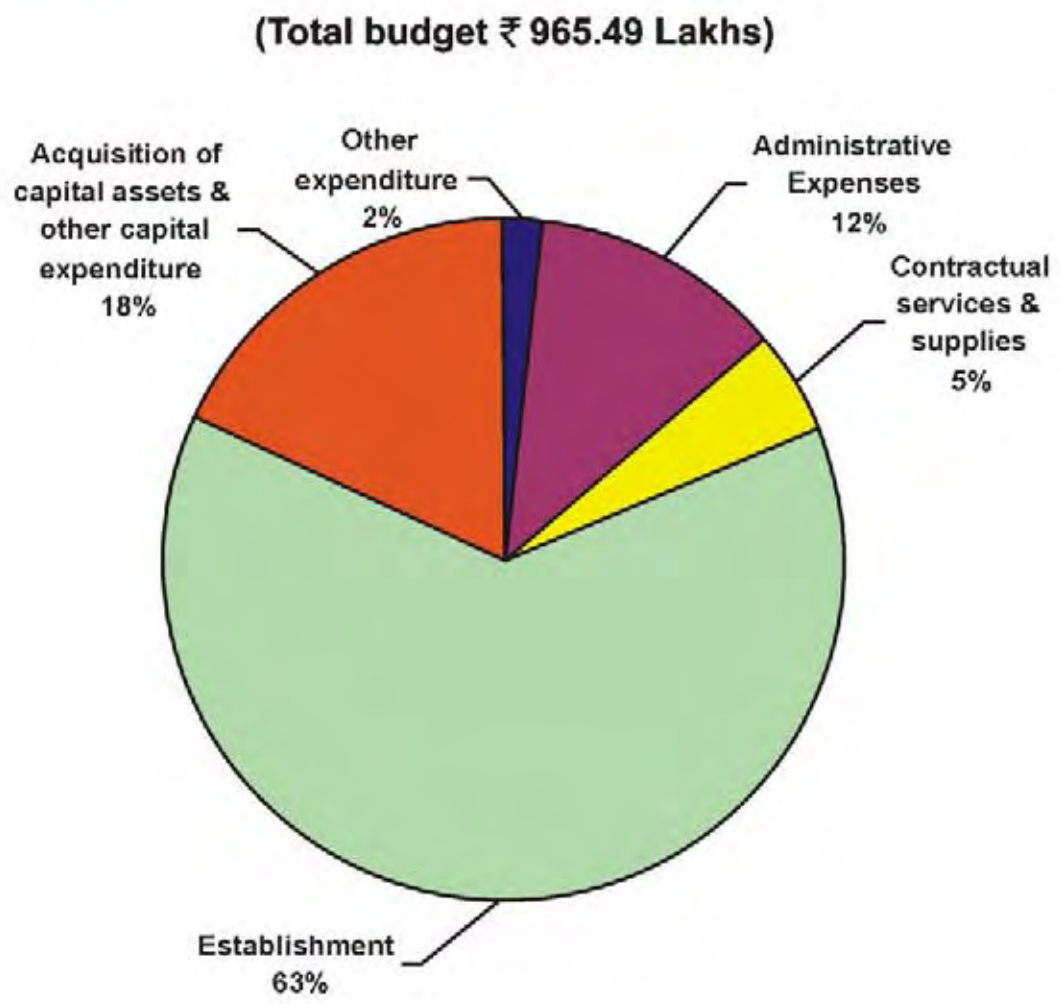
Scientific Advisory Committee

1.	Lt. Gen. D. Raghunath Principal Executive, Sir Dorabji Tata Centre for Research in Tropical Disease Indian Institute of Science Campus, Bangalore-560 012	**Chairman**
2.	Prof. R.C. Mahajan S.N. Bose INSA Research Prof. & Emeritus Professor Post Graduate Institute of Medical Education & Research, Chandigarh - 160 012	**Member**
3.	Dr. S. Pattanayak B-91, Swasthya Vihar Vikas Marg, Delhi-110092	**Member**
4.	Dr. D.S. Agarwal, B-24, Swasthya Vihar Vikas Marg, Delhi-110 092	**Member**
5.	Dr. Sarala K. Subbarao Emeritus Medical Scientist Department of ECD, ICMR Ansari Nagar, New Delhi - 110 029	**Member**
6.	Dr. Rashmi Arora Scientist 'F' Indian Council of Medical Research Ansari Nagar, New Delhi-110 029	**Member**
7.	Prof. Arvind Pandey Director National Institute of Medical Statistics Ansari Nagar, Delhi - 110029	**Member**
8.	Dr. S.S. Agarwal Emeritus Scientist (CSIR) D-13, Vivekananda Puri, Lucknow-226 007	**Member**
9.	Shri O.P. Rawat, IAS Principal Secretary, Tribal Welfare Govt. of M.P., Mantralaya, Bhopal.	**Member**
10.	Dr. P. R. Narayanan Director Tuberculosis Research Centre, Chetput, Spur Tank Road, Chennai-600 031	**Member**
11.	Dr. Neeru Singh Director Regional Medical Research Centre for Tribals Nagpur Road, Jabalpur	**Member Secretary**

Ethics Committee

1.	Dr. Arun Sharma Professor and Head, Deptt. of Radiodiagnosis, NSCB Medical College, Jabalpur	**Chairman**
2.	Dr. S. P. Pandey Professor & Head, Deptt of Pharmacology NSCB Medical College, Jabalpur	**Member**
3.	Dr. B. K. Sahu Head, Deptt. of Sociology Rani Durgavati Vishwa Vidhyalaya Jabalpur	**Member**
4.	Dr. Pushpa Kirar Professor of Radiotherapy, Cancer Hospital NSCB Medical College, Jabalpur	**Member**
5.	Mr. Jamal Akhtar Baig Director, ENFORCE (NGO) G-2 / 167, Sameer House, E-8, Gulmohar, Bhopal- 462039	**Member**
6.	Prof. Karuna Verma Head, Deptt. of Biological Sciences, Rani Durgawati Vishwavidyalaya, Jabalpur	**Member**
7.	Shri Ashish Shroti Advocate, High Court of M.P., Kamala Nehru Nagar, Yadav Colony Chowk, Jabalpur - 482 002	**Member**
8.	Dr. Gayatri Sinha Professor, Department of Philosophy Rani Durgawati Vishwavidyalaya, Jabalpur	**Member**
9.	Shri Komal Prasad Viswakarma At: Mukunwara, Post : Ghatpiparia Ta. & Distt. : Jabalpur	**Member**
10.	Dr. V. G. Rao, Scientist F RMRCT (ICMR), Jabalpur	**Member Secretary**

11.7. Budget 2009-10



11.8. राजभाषा नीति के कार्यान्वयन एवं अनुपालन से संबंधित प्रगति रिपोर्ट

क्षेत्रीय जनजाति आयुर्विज्ञान अनुसंधान केन्द्र (भा0आ0अ0प0), जबलपुर में भारत सरकार, गृह मंत्रालय, राजभाषा विभाग की राजभाषा नीति के समुचित कार्यान्वयन एवं अनुपालन के लिए सतत् प्रयास किए जा रहे हैं। प्रतिवेदन अवधि के दौरान इस केन्द्र में हिंदी के प्रगामी प्रयोग एवं सरकारी कामकाज में हिंदी के प्रयोग को बढ़ावा देने हेतु किए गए प्रयासों का संक्षिप्त विवरण इस प्रकार है :–

1. राजभाषा नीति कार्यान्वयन समिति

राजभाषा विभाग के आदेषानुसार इस अनुसंधान केन्द्र में 'राजभाषा कार्यान्वयन समिति' गठित है :–

1. डॉ. नीरू सिंह, निदेशक	– अध्यक्ष
2. डॉ. व्ही0जी0राव, वैज्ञानिक 'एफ'	– सदस्य
3. श्री ज्ञानचंद जैन, प्रशासनिक अधिकारी	– सदस्य
4. श्री द्वारका प्रसाद लोधी, अनुभाग अधिकारी, (स्थापना)	– सदस्य
5. श्री प्रफुल्ल कुमार भालेराव, अनुभाग अधिकारी (भंडार)	– सदस्य
5. श्री हाकिम सिंह ठाकुर, कनिष्ठ हिंदी अनुवादक	– सदस्य

प्रत्येक तीन माह में इस समिति की बैठक होती है, जिसमें इस अनुसंधान केन्द्र में राजभाषा कार्यान्वयन एवं अनुपालन की स्थिति की समीक्षा की जाती है तथा सरकार द्वारा निर्धारित लक्ष्यों को प्राप्त करने हेतु आवश्यक उपायों की संस्तुति की जाती है। अभी तक इस समिति की कुल 68 तिमाही बैठकें आयोजित की जा चुकी हैं।

2. हिंदी पत्राचार

प्रतिवेदन अवधि के दौरान इस केन्द्र द्वारा 'क' क्षेत्र को लगभग 50% पत्राचार किया गया। साथ ही सरकार द्वारा निर्धारित लक्ष्य के अनुरूप हिंदी पत्राचार को 'क' क्षेत्र के अलावा 'ख' एवं 'ग' क्षेत्रों के साथ भी मूल हिंदी पत्राचार को बढ़ाने के लिए प्रयास किए जा रहे हैं।

3. धारा 3(3) एवं राजभाषा नियम–5 का अनुपालन

राजभाषा अधिनियम, 1963 (यथासंषोधित 1967) की धारा 3(3) के अनुपालन में सामान्य–आदेश, परिपत्र, निविदा सूचना एवं निविदा प्रपत्र आदि निर्दिष्ट दस्तावेजों के अतिरिक्त रिक्त पदों के विज्ञापन आदि भी हिंदी व अँग्रेजी में द्विभाषी रूप में जारी किए जाते हैं।

4. प्रशिक्षण

इस केन्द्र के अधिकांश अधिकारियों एवं कर्मचारियों को हिंदी का कार्यसाधक ज्ञान/प्रवीणता प्राप्त है और यह केन्द्र राजभाषा नियम 10.4 के अंतर्गत अधिसूचित है।

राजभाषा विभाग के निर्देषों के अनुसार जिन कर्मचारियों को हिंदी टंकण एवं हिंदी आशुलिपि के सेवाकालीन प्रशिक्षण की आवश्यकता थी, उन सभी को हिंदी शिक्षण योजना, राजभाषा विभाग, जबलपुर कार्यालय से हिंदी टंकण/हिंदी आशुलिपि का प्रशिक्षण दिलाया गया है और इस मद में भी शत–प्रतिशत लक्ष्य प्राप्त कर लिया गया है।

5. विभागीय परीक्षाओं में द्वि–भाषी प्रश्न–पत्र उपलब्ध कराना

सरकार द्वारा जारी निर्देशों के अनुसार, इस केंद्र में अधीनस्थ सेवाओं की भर्ती परीक्षा एवं विभागीय परीक्षाओं में द्विभाषी प्रश्न–पत्र उपलब्ध कराए जा रहे हैं।

6. प्रशिक्षण कार्यक्रमों एवं वैज्ञानिक विषयों पर व्याख्यानों में हिंदी को प्रमुखता

इस केन्द्र में अनुसंधान कार्य से संबंधित प्रशिक्षण कार्यक्रमों और वैज्ञानिक व्याख्यानों आदि में हिंदी को प्रमुखता प्रदान की जाती है, जिससे अधिक से अधिक लोगों तक इसका लाभ पहुँच सके।

7. हिंदी–दिवस/हिंदी–पखवाड़ा

राजभाषा विभाग के निर्देशों के अनुसार केन्द्र में प्रति–वर्ष हिंदी–दिवस एवं हिंदी पखवाड़ा मनाया जाता है। इस दौरान निदेशक महोदया द्वारा केन्द्र के सभी अधिकारियों एवं कर्मचारियों से सरकारी कामकाज अधिकाधिक हिंदी में करने की अपील की जाती है, कर्मचारियों के लिए हिंदी प्रतियोगिताएँ आयोजित की जाती हैं।

प्रतिवेदन की अवधि के दौरान इस केंद्र में 'हिंदी पखवाड़ा (14–28 सितंबर, 2009) के अंतर्गत आयोजित हिंदी प्रतियोगिताओं के विजेताओं को दिनांक 29 सितंबर, 2009 को आयोजित " राजभाषा पुरस्कार वितरण समारोह" में निम्नलिखित राशि नकद पुरस्कारों के रूप में प्रदान की गई :–

(क) हिंदी टंकण (टंकण मशीन)

प्रथम पुरस्कार	श्री शैलेश कुमार सहाय, उ0श्रे0लि0	रु. 1500
द्वितीय पुरस्कार	श्रीमती फिलोमिना लकड़ा, उ0श्रे0लि0	रु. 1200
तृतीय पुरस्कार	श्रीमती पुष्पा उमाटे, सहायक	रु. 800
सांत्वना पुरस्कार	श्री प्रेम सिंह, चौकीदार	रु. 600
सांत्वना पुरस्कार	श्री के. वेणुगोपाल राव, भंडार परिचारक	रु. 600

(ख) हिंदी टंकण (कम्प्यूटर)

प्रथम पुरस्कार	श्री नवीन शिवा, आँप्रवि.प्रचा. (परियो.), परियोजना, राष्ट्रीय मलेअनु.संस्थान फील्ड स्टे. जबलपुर	रु. 1500
द्वितीय पुरस्कार	श्री परमजीत सिंह चाना, आँ.प्रवि.प्रचा. (परियो.), परियोजना, राष्ट्रीय मलेअनु.संस्थान फील्ड स्टे. जबलपुर	रु. 1200
तृतीय पुरस्कार	श्री रामानुज कुमार, आँकड़े, प्रवि. प्रवालक ग्रेड 'ए'	रु. 800
सांत्वना पुरस्कार	श्री उमाशकर तिवारी, आँ.,प्रवि.प्रचा. (परियो.), परियोजना, राष्ट्रीय मलेअनु.संस्थान फील्ड स्टे. जबलपुर	रु. 600
सांत्वना पुरस्कार	श्री सुबाष चंद्र मुदुलि, आशुलिपिक	रु. 600

(ग) हिंदी टिप्पण एवं प्रारूप–लेखन

प्रथम पुरस्कार	श्री रामकुमार वर्मा, वायरमैन	रु. 1500
द्वितीय पुरस्कार	श्री सुबाष चंद्र मुदुलि, आशुलिपिक	रु. 1200
तृतीय पुरस्कार	श्री जगदीश प्रसाद मिश्रा, क्षेत्र सहायक	रु. 800
सांत्वना पुरस्कार	श्री के.वेनुगोपाल राव, भंडार परिचारक	रु. 600
सांत्वना पुरस्कार	श्री नवीन शिवा, आँ.प्रवि.प्रचा. (परियो.), परियोजना, राष्ट्रीय मले.अनु.संस्थान फील्ड स्टे. जबलपुर	रु. 600

(घ) हिंदी निबंध–लेखन (कर्मचारी समूह)

प्रथम पुरस्कार	डॉ0नरेन्द्र कुमार चौधरी, चिकित्सा सामाजिक कार्यकर्ता	रु. 1500
द्वितीय पुरस्कार	श्री विकास कुमार गुप्ता, आँप्रवि.प्रचा. (परियो.), परियोजना, राष्ट्रीय मलेअनु.संस्थान फील्ड स्टे जबलपुर	रु. 1200
तृतीय पुरस्कार	श्री शिवकुमार सिंह, प्रयोगशाला तकनीशियन	रु. 800
सांत्वना पुरस्कार	श्री लक्ष्मण सिंह कौशल, प्रयोगशाला तकनीशियन	रु. 600
सांत्वना पुरस्कार	श्री एस.के. उपाध्याय, क्षेत्र प्रयोगशाला परिचा. राष्ट्रीय मले. अनु. संस्थान फील्ड स्टे. जबलपुर	रु. 600

(च) हिंदी निबंध–लेखन (वैज्ञानिक/अधिकारी समूह)

प्रथम पुरस्कार	श्री अजय राक्सेना, साहा.अनुसं.वैज्ञा. राष्ट्रीय मले.अनु.संस्थान फील्ड स्टे. जबलपुर	रु. 1500
द्वितीय पुरस्कार	श्री दिनेश कुमार, वैज्ञानिक 'सी'	रु. 1200
तृतीय पुरस्कार	डॉ. आर. के. शर्मा, वैज्ञानिक 'बी'	रु. 800
सांत्वना पुरस्कार	श्री कल्याण ब्रत साहा, वैज्ञानिक 'डी'	रु. 600

(छ) हिंदी तात्कालिक–भाषण

प्रथम पुरस्कार	श्री समर बहादुर सिंह, अनुसंधान सहायक	रु. 1500
द्वितीय पुरस्कार	डॉ. ज्योति टी. भट, वैज्ञानिक 'बी'	रु. 1200
तृतीय पुरस्कार	डॉ. आर. के. शर्मा, वैज्ञानिक 'बी'	रु. 800
सांत्वना पुरस्कार	1. डॉ0नरेन्द्र कुमार चौधरी, चिकित्सा सामाजिक कार्यकर्ता	रु. 400
	2. डॉ.एम.एम.शुक्ला, वैज्ञानिक 'ई' राष्ट्रीय मले अनु संस्थान फील्ड स्टे. जबलपुर	रु. 400
	3. श्री एसके. उपाध्याय, क्षेत्र प्रयोगशाला परिचा परियो. राष्ट्रीय मलेअनुसंस्थान फील्ड स्टे. जबलपुर	रु. 400

(ज) हिंदी कविता–पाठ

प्रथम पुरस्कार	डॉ0 नरेन्द्र कुमार चौधरी, चिकित्सा सामाजिक कार्यकर्ता	रु. 1500
द्वितीय पुरस्कार	श्री एस.के. उपाध्याय, क्षेत्र प्रयोग.परिचारक, परियोजना, राष्ट्रीय मले.अनु.संस्थान फील्ड स्टे. जबलपुर	रु. 1200
तृतीय पुरस्कार	श्री मोहन लाल कोरी, अनुसंधान सहायक	रु. 800
सांत्वना पुरस्कार	1. श्री समर बहादुर सिंह, अनुसंधान सहायक	रु. 400
	2. श्री एम.पी. सिंह, प्रयोग. तकनी. राष्ट्रीय मले.अनु.संस्थान फील्ड स्टे.	रु. 400
	3. श्री सुधीर सेन, कीट संग्राहक, राष्ट्रीय मले.अनु. संस्थान फील्ड स्टे. जबलपुर	रु. 400

8. प्रकाशन

इस अनुसंधान केन्द्र से जनजातियों की विशिष्ट स्वास्थ्य समस्याओं के अध्ययन एवं अनुसंधान के बारे में प्रकाशित 'ट्राइबल हैल्थ बुलेटिन' (अँग्रेजी में) तथा हिंदी में 'आदिवासी स्वास्थ्य पत्रिका' के नाम से प्रकाशित की जाती है। 'आदिवासी स्वास्थ्य पत्रिका' का खण्ड–13, अंक 1 एवं 2 जनवरी एवं जुलाई, 2007 का प्रकाशन किया गया है।

11.9. Staff List

Scientist Cadre

Dr. Neeru Singh, MSc, PhD	Director & Scientist' G'	
Dr. R. S. Balgir, PhD	Scientist 'F'	Bio-Chemistry & Immunology
Dr. V. G. Rao, MBBS, MD	Scientist 'F'	Community Medicine
Dr. Tapas Chakma, MBBS, MAE	Scientist 'E'	Community Medicine
Dr. R. B. Gupta, MSc, PhD	Scientist 'E'	Genetics
Dr. S. R. Qamra, MSc, PhD	Scientist 'D'	Anthropology
Dr. Kalyan B. Saha, MSc, MPS, PhD	Scientist 'D'	Demography
Shri Gyan Chand, MSc	Scientist 'D'	Entomology
Dr. Jyothi Bhat, MBBS, MD	Scientist 'D' *	Microbiology
Dr. Dinesh Kumar, PhD	Scientist 'C'	Statistics
Dr. Surender Kumar, MBBS	Scientist 'C'	Community Medicine
Dr. Chandra K. Dolla, MBBS, MPH	Scientist 'C'	Community Medicine
Dr. Ravendra K. Sharma, MPhil, PhD	Scientist 'C' **	Statistics
Dr. Pradip V. Barde, PhD	Scientist 'C' ***	Microbiology
Dr. Praveen K. Bharti, PhD	Scientist 'C' ****	Biotechnology
Dr. Rajiv Yadav, MBBS, MD	Scientist 'B'	Genetics

Technical Cadre

Shri V. Soan, MSc	Technical Officer A
Dr. N. K. Choudhary, MA, PhD	Technical Officer A
Dr. R.C. Mishra, MA, PhD	Technical Officer A
Dr. D. C. Jain, MSc, PhD	Technical Assistant(R)
Dr. Jyotirmoy Roy, MA, PhD	Technical Assistant(R)
Dr. Manoj K. Bhondeley, MSc, MPhil, PhD	Technical Assistant(R)
Dr. Bal Krishna Tiwari, MA, PhD	Technical Assistant(R)
Shri Praval Srivastava, MA	Technical Assistant(R)
Shri P. Vinay Rao, MSc	Technical Assistant(R)
Dr. Arvind Verma, MSc, PhD	Technical Assistant(R)
Dr. Alpana Abbad, MA, PhD	Technical Assistant(R)
Shri M.P.S.S. Singh, MSc	Technical Assistant(R)
Shri Arvind Kavishwar, MSc, PGDCA	Technical Assistant(R)
Shri Ajay K. Goel, MA	Technical Assistant(R)
Shri Samar Bahadur Singh, MA, LLB	Technical Assistant(R)
Shri Pradeep K. Meshram, MA, MPhi	Technical Assistant(R)
Shri Vijay S. Gadge, MSc, DMLT	Technical Assistant(R)
Shri Mohan Lal Kori, MA	Technical Assistant(R)
Smt Ujjwala Das, MSc	Technical Assistant(R)#
Smt. Maya Pandey, MA	Technical Assistant(R)
Shri G. P. Shukla, BSc	Tech Assistant
Smt. Savinder Rao, BSc, CMLT	Tech Assistant
Shri Chandan Karforma, BSc, DMLT	Tech Assistant

** Joined on 21.01.10; ** Joined on 21.12.09; ***Joined on 22.02.10; **** Joined on 16.03.10;*
 # resigned on 12/06/09.

Shri Rajendra K. Minocha, Hr. Sec, DMLT	Tech Assistant
Smt Canina Luke, Hr. Sec	Technician C
Shri Subhash Godbole, MSc	Technician C
Shri Shiv Kumar Singh, MA	Technician C
Shri Purshottam Patel, Hr. Sec, CMLT	Technician C
Shri Mohan Lal Patel, Hr. Sec	Technician C
Shri Mahendra J. Ukey, Hr.Sec, DMLT	Technician C
Shri L. S. Kaushal, BSc, CMLT	Technician C
Shri Rajju Lal Neelkar, Hr. Sec	Technician C
Shri C. P. Vishwakarma, BA	Technician C
Shri Ashok K. Gupta, BA, CMLT	Technician C
Shri Anil Gwal, BSc, CMLT	Technician C
Shri Lalit K. Sahare, Hr. Sec, DMLT	Technician C
Smt. Nazia Anwar Ali	Technician C
Smt. Reena Shome, BSc	Technician C
Shri S. R. Mishra, Hr. Sec	Technician A
Shri Rakesh K. Jaiswal, Hr. Sec	Technician A
Shri M. P. Tiwari, MA	Technician A
Shri Ghanshyam Ahirwar, Hr. Sec	Technician A
Shri D. K. Mishra, BA	Technician A
Shri D. C. Khatarkar, Hr. Sec	Technician A
Shri B. S. Patel, Hr. Sec	Technician A
Shri Ajesh Kumar Dubey, Hr. Sec	Technician A
Shri Jagdish P. Mishra, MA	Technician B
Shri Vijay K. Kachhi, MA	Technician B
Shri Jagdish Singh, IX	Technician B
Shri Dhan Singh Thakur, VIII	Technician B
Shri Sheikh Saleem, IV	Attendant (Services)
Shri Promod Choubey, MA	Attendant (Services)
Shri Suresh K. Burman, VIII	Attendant (Services)
Shri Sukhlal Vishwakarma, Hr. Sec	Attendant (Services)
Shri Rajendra P. Gond, VIII	Attendant (Services)
Shri Jagdish P. Thakur, VIII	Attendant (Services)
Shri Prakash Sangle., Hr.Sec	Attendant (Services)
Smt Shashi Prabha Mishra	Attendant (Services)
Shri Shamshad Ali Ansari	Attendant (Services)

Library

Shri K.V.K. Rao, MCom, BLib	Asst. Lib. & Inf. Officer
Shri S.N. Singh, MA, MLib	Library Information Asst.
Shri Ganga Bahadur, VIII	Attendant (Services)

National Nutritional Monitoring Bureau (MP Unit)

Dr. Rakesh Babu, MBBS	ARS
Mrs. S. J. Khan, MHSc	ARS
Shri Gajanan Dhore, MSW	Social Worker

Integrated Counseling & Testing Centre

Ms. Sharddha Shrivastava, MA	Counselor
Shri K. K. Verma, BSc, PGDCP&DT	Lab. Technician
Shri Manish Vishwakarma, DMLT	Lab. Technician*

Administrative Cadre

Shri W.H. Venkatseshan,,BSc	Administrative Officer#$
Shri Gyan chandra Jain, BA	Administrative Officer$
Shri B. K. Majumdar, BCom	Accounts Officer$$
Shri Sudesh K. Yadaw, MA, LLB	Personal Assistant
Shri P. K. Bhalerao, MCom	Section Officer$$$
Shri D. P. Lodhi, MA, LLB	Section Officer$$$$
Shri P.K.Argal,MA	Assistant$$$$$
Shri S. K. Vinodia, BCom	Assistant^
Shri Rajendra K. Thakur, BSc	Assistant
Shri Hakim Singh Thakur, MA	Jr. Hindi Translator
Smt. Pushpa Umate, MA	Assistant^^
Shri Bhagwani Prasad Kol, Hr. Sec	Upper Division Clerk
Shri Raj Kumar Handa, Hr. Sec	Upper Division Clerk
Shri Raghubir Prasad, Hr. Sec	Upper Division Clerk
Shri P. K. Srivastava, MA, LLB	Upper Division Clerk
Smt. Filomina Lakra, BA	Upper Division Clerk
Shri Sailesh K. Sahai, Hr. Sec	Upper Division Clerk
Shri Baisakhu Lal, Hr. Sec	Upper Division Clerk^^^
Shri Ram N. Dubey, Hr. Sec	Lower Division Clerk^^^^
Shri Subhash C. Muduli, MA, BLib	Stenographer
Shri Subash S. Kumbhare, BSc, Com. Opt.	Technician C
Shri Prakash C. Shrivastava, BA	Technician C
Shri Ramanuj Kumar, BSc	Technician B##
Shri Narendra Kumar Jharia, BCom	Hindi Typist###
Shri Promod Kumar Garg, Hr. Sec	Attendant (Services)
Shri Laxman Prasad, VIII	Attendant (Services)
Shri Rameshwar Prasad, HSC	Attendant (Services)
Shri P. K. Namdev, MA	Technician A (Engg. Sup.)
Shri Tulsi Ram Kurmi, HSC	Driver
Shri Ram Narayan, IX	Driver
Shri Ashok Kumar Saini, VI	Driver
Shri Paramjeet Singh, IX	Driver
Shri Ramesh Kumar Gond, Hr. Sec	Driver
Shri Genda Lal, VIII	Driver
Shri Ravindra Kumar Katraha, VIII	Driver

** joined on 20/08/2009; #$ retired on 31.07.09; $ Joined on 11.09.09; $$ retired on 31.01.10; $$$ Joined on 31.03.10; $$$$ Joined on 17.02.10; $$$$$ Voluntary retired on 02.01.09; ^ Compulsory retirement on 25.09.09; ^^Joined on 30.07.09; ^^^ Joined on 30.07.09; ^^^^ Voluntary retired on 02.02.10; ## Joined on 22.06.09; ###joined on 5.01.10.*

Shri Baidraj Kachhi, VII	Attendant (Services)
Shri Madan Singh Maravi, HSC	Attendant (Services)
Shri Preetam Lal Gond, VIII	Attendant (Services)
Shri Suresh K. Pareha, IV	Attendant (Services)
Shri K. Venugopal Rao, Hr. Sec	Attendant (Services)
Shri Ramesh Kumar Ahirwar, VII	Attendant (Services)
Shri Suresh Jaiswal, Hr. Sec	Attendant (Services)
Shri Umesh Gautam, BCom	Attendant (Services)
Shri Anil Vinodia, HSC	Attendant (Services)
Shri Malikhan Singh, HSC	Attendant (Services)
Shri Santosh Kumar Sonkar, IV	Attendant (Services)
Shri Ajay K. Soni, Hr. Sec	Attendant (Services)
Shri Santosh K. Kol, VIII	Attendant (Services)
Shri Prem Singh Gond, VIII	Attendant (Services)
Shri Bhagwan Singh, HSC	Attendant (Services)
Shri Ram K. Mehra, VIII	Attendant (Services)
Shri Summat Singh, VIII	Attendant (Services)
Shri Munna Lal, V	Attendant (Services)
Mr. Devprakash Dubey	Attendant (Services)
Shri Ram K. Verma, Hr. Sec	Technician A (Engg. Support)
Shri Shesh Narayan, H Sec	Attendant (Services)
Shri Arakh C. Malik, VIII	Attendant (Services)
Shri Vishnu Prasad, VIII	Attendant (Services)
Shri Sone Lal Dumar, VI	Attendant (Services)
Shri Papu Lal Dumar, VIII	Attendant (Services)



Published by
Director
Regional Medical Research Centre for Tribals
(Indian Council of Medical Research)
Nagpur Road, Garha
Jabalpur – 482 003 (M.P.)
Tel: (0761) 2370800, 2370818
Fax: (0761) 2672835
E-mail : rmrctjabalpur@rediffmail.com
www.rmrct.org