RMRCT
UPDATE
VOL.3
NO.1
APRIL 2006
A Biannual Newsletter of
Regional Medical Research Centre for Tribals, Jabalpur

Inside . . .

- Sickle Cell Disease Load in M.P. 1
- Publicatons 5
- Conferences/Workshops attended 7
- Rajbhasha Fortnight 8
- National Science Week 8
- New scientists Join RMRCT 8
- Foundation Day 8
- Retirement 8

Editor-in-Chief:
DR. NEERU SINGH
Officer-in-charge

Editor:
DR. ANUP ANVIKAR
Assistant Director

Asst. Editor:
MR. VIJAY GADGE
Research Assistant

Arts & Photography
DR. R.C.MISHRA
Sr. Artist-cum-Photographer

SICKLE CELL DISEASE LOAD IN MADHYA PRADESH

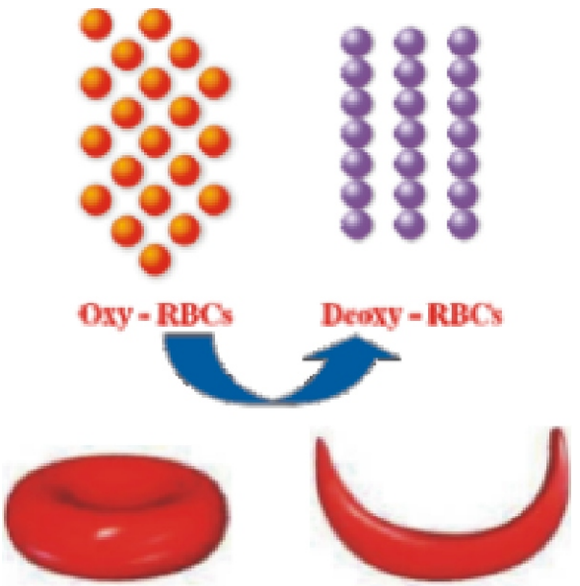
Dr. R. B. Gupta, Assistant Director

Sickle cell disease is a genetic disorder commonly found among people of tropical countries and transmitted as autosomal recessive character. If a person receives only one gene responsible for sickle haemoglobin from either of the parent, the condition is called carrier or trait. If one inherits two defective genes, one from each parent, the condition is called sickle cell disease. As the carrier state is stated to provide protection against mortality against malaria, it has attained high frequency in many parts of the tropical world. Person with trait leads a normal life but the diseased person suffers from various complications throughout the life such as anaemia, bone & joint pain, joint swelling, recurrent infection, osteomyelitis, necrosis of bone, aplastic crises, abdominal pain, splenic sequestration crises, hepato-splenomegaly etc. (Serjeant & Serjeant, 2001).

Sickle haemoglobin (HbS) is a first molecular disease known to man. It is a structural variant of haemoglobin in which glutamtic acid, an amino acid, at position No.6 of -globin chain of haemoglobin is replaced by valine. This happens due to change of a nucleotide, adenine to thymine (GAG→GTG) of codon 6 of -globin gene. This substitution of amino acid changes the net charge of haemoglobin, oxygen affinity and three-dimensional structure thus rendering it as unstable haemoglobin. Sickle haemoglobin gets polymerized at low oxygen tension and deforms the red blood cell from discoid shape to sickle like (crescent) form (Fig.1). The immune status of these patients is also reduced. Hence, they fall pray to various infective agents very easily. The average life expectancy of these patients is not known in Indian context, but it is considerably reduced as compared to normal individuals. In India

most of these patients are managed symptomatically without the special reference to cause of the disease.

Figure 1. Normal and sickle haemoglobin



In India, sickle haemoglobin was first discovered by Lahmann and Cutbush about 50 years ago among the tribals of Nilgiri Hills of Southern India. Later, subsequent studies conducted by various workers reported its high frequencies throughout Central India and parts of Southern India (Bhatia and Rao, 1987, Kar, 1991 and unpublished reports). The prevalence rate of sickle haemoglobin in Madhya Pradesh ranges from 10% to 33% among different castes and tribal groups (Fig.2). There is a need to map the prevalence of this gene at micro level i.e. its variations in the different tribal groups and within a tribal group spread over a large area. Gond and Bhil group of tribals constitute a large proportion of tribal population of the state. Among Gonds, the prevalence of sickle haemoglobin varies from 10% to 25% where as in the Bhils, the prevalence rate varies from 15% to 33%. Earlier studies carried out by various workers show that in Madhya Pradesh, the Scheduled Caste and Backward Class communities of the tribal predominant areas also have sickle cell gene in almost similar proportion (Unpublished reports). However, in some scheduled caste populations, its prevalence is even higher than the adjoining tribal population. Hence, the problems of sickle cell gene in Madhya Pradesh exist among scheduled tribes, scheduled castes and backward class communities.

Figure 2. Distribution of Common Abnormal Haemoglobins in India



As per census 2001, the total scheduled tribe and scheduled caste population of Madhya Pradesh is over 96 lacs and 74 lacs respectively

which is about 20% and 15% of the total population of the state. Out of 45 districts, 27 fall under sickle cell belt. These districts (arranged in descending order of ST & SC population) are Jhabua, Barwani, Dindori, Mandla, Dhar, Shahdol, Umaria, Betul, Seoni, West Nimar, Chhindwara, Harda, East Nimar, Jabalpur, Ratlam, Dewas, Katni, Damoh, Hoshangabad, Sagar, Satna, Balaghat, Ujjain, Indore, Mandsaur, Neemah and Narsimhpur (Fig.3). The total SC and ST population of these districts is about 82 lacs as per census 2001.

The prevalence rate of -thalassamia is not known many tribes and scheduled castes of the state. However, some studies conducted by RMRCT reported that a few tribal groups have high prevalence (6%-10%) in the state. However, in most of the tribals and scheduled caste communities, its prevalence generally varies from 1% to 4%. The population groups which have high prevalence of sickle haemoglobin (over 25%), generally have low prevalence of - thalassaemia e.g. Pardhans of Dindori district and Mehras (SC group) of Betul district. -thalassaemia is found commonly in other forward communities like Sindhi, Punjabi etc. of the state with a high prevalence rates. In general, it can be safely presumed that the average prevalence of - thalassaemia in SC & ST communities is about 2 %.

Information regarding the prevalence of sickle haemoglobin is known to us for most of these districts, which varies from 5% to 30%. There are variations within the same tribe as well. Caste/tribe wise census data of the state is not available. Hence, average prevalence of sickle haemoglobin for each district was presumed based on the prevalence of the gene in different population groups of the same district (Fig.4). The average prevalence of sickle haemoglobin in Gond tribe is 15 % except in Chhindwara, but generally it varies from 15% to 25%. In Chhindwara district, Gond tribe has a low prevalence rate (4%), whereas in Bharia and Korku tribes, which reside in the same district, its prevalence is 20% and 15 % respectively. Hence, an average prevalence of 10% was taken for computing the disease load. The Scheduled Caste population of Central and Eastern M.P. has HbS ranging from 15% to 33%. Hence, average prevalence of 15% was taken for computing the figures. In Satna district, the prevalence of HbS among Kol tribe is low i.e. about 5%. But Gond, Bhumia and Baiga tribes, living in the district in a large proportion, has a prevalence of HbS as 15 to 20 percent. Hence, on average prevalence of 10% was taken for computation.

Likewise, the prevalence of HbS in tribes of Western M.P. i.e. Bhil group of tribes, varies from 18% to 33% but in scheduled castes it generally varies from 10% to 15%. The average prevalence rate of -thalassaemia was taken as 2% is for all these 27 districts. These prevalence rates were taken to compute the expected disease load due to sickle cell disease among the Scheduled tribes and scheduled castes for these 27 districts.

Disease load due to sickle cell disease in Madhya Pradesh

The status of sickle cell disease is very alarming in Madhya Pradesh. About 3358 newborn babies with sickle cell disease are expected to be added every year and about 13,432 pregnancies are at risk annually. These pregnancies need to be

monitored for prenatal diagnosis in order to avoid the birth of a sickle cell disease child. About 70,000 high-risk couples of eligible age group need be counseled for management and prevention of sickle cell disease. The total disease load is likely to go up due to population growth since 2001 and inclusion of OBC groups for computing disease load.

Prevention and management:

With the advances in molecular genetics, it is possible to detect the defect at early stage (10 to 15 weeks) of pregnancy. The management cost of these patients is very high and resources with Government are limited. Hence, the prevention appears to be the only solution in present circumstances. With a comprehensive medical care and management approach, the health status and life expectancy of these patients can be improved considerably. The high-risk couple for these disorders should be identified at the time ante-natal care and each pregnancy should be monitored. The couple should be given appropriate counselling after prenatal diagnosis. The facilities and technical know-how for diagnosis of the disorder and its clinical management should be generated at PHC/ district hospital level depending upon the disease load. There should be at least two to three genetic counselling centres in the state for prenatal diagnosis and counselling. The State Government should have comprehensive plan for prevention and management of the sickle cell disease.

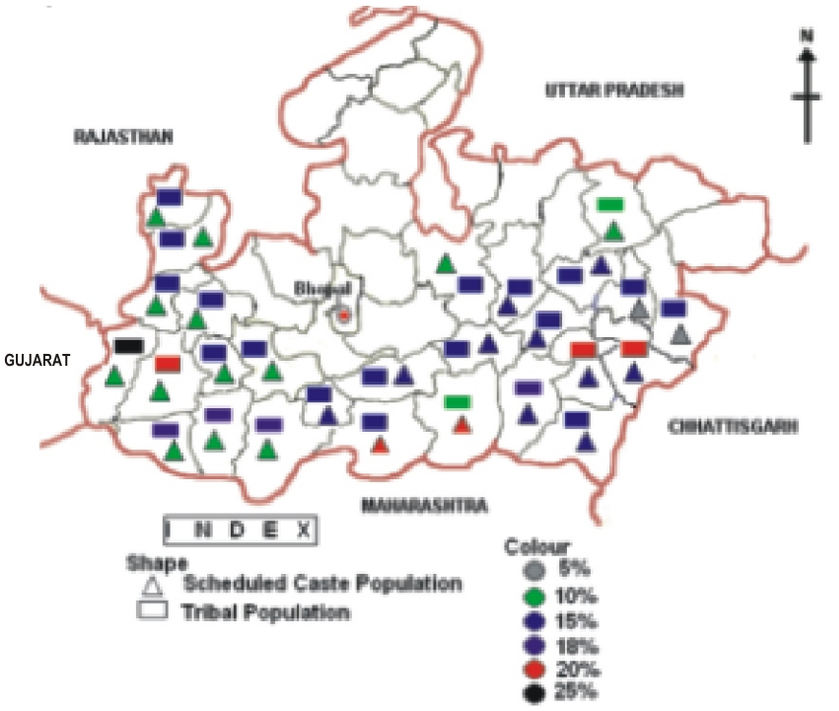
References:

1. Annual Reports, RMRCT (ICMR), Jabalpur, 1986 to 2004
2. Bhatia, H. M. and Rao V. R. (1987) Genetic Atlas of the Indian Tribes. Institute of Immunohaematology, (ICMR), Bombay, India.
3. Kar, B. C. (1991). Sickle cell disease in India. Journal of Association of Physician of India, 39: 954-960.
4. Lehmann, H. and Cutbush, M. (1952). Sickle cell trait in southern India. British Medical Journal, i, 404.
5. Serjeant, G.R. and Serjeant, B.E. (2001) Sickle Cell Disease. Oxford University Press, New York.

Figure 3. Sickle cell gene belt in Madhya Pradesh



Figure 4. Average Prevalence of HbS in tribal and Scheduled Caste populations of Madhya Pradesh



PUBLICATIONS

In Indexed Journals:

1. Das D., Kumar S., Sahoo P.K., Dash A.P. (2005) A survey of bancroftian filariasis for microfilariae and circulating antigenaemia in two villages of Madhya Pradesh. Indian Journal of Medical Research 121: 771-775 (0.600).
2. Mitra P., Vinayak S., Chandawat H.,. Das M.K., Singh N., Biswas S., Dev V., Kumar A., Ansari M.A., and. Sharma Y.D., (2006). Progressive increase in point mutations associated with Chloroquine resistance in *Plasmodium falciparum* isolates from India. Journal of infectious Disease 193: 1304-1312
3. Dunne M. W., Singh N., Shukla M., Valecha N., Bhattacharya P.C., Patel K., Mohapatra M.K., Lakhani J., Usha Devi C., Adak T., Dev V., Rajpal S., Yadav, Lele C., and Patki K., (2005). A double blind Randomized study of Azithromycin, compared to Chloroquine, for the treatment of *Plasmodium vivax* Malaria in India. American Journal of Tropical Medicine and Hygiene 73(6):1108-1111.

4. Dolla C.K. Dash A.P. (2005). Prevalence of risk factors of cancer cervix in married women of aboriginal Community Baiga's primitive tribe in Madhya Pradesh Indian Journal of Medical Research. 121 (supplement) 146-47. (0.600)
5. Kumar D. (2005) Tribal literacy disparity in India. Current Science 88(5): 676. (0.688)
6. Rao V.G., Sugunan A.P., Murhekar M.V., Sehgal S.C.(2006) Malnutrition and high childhood mortality among Onges- A primitive tribe of A & N islands. Public Health Nutrition. 9(1), 19-25. (1.747)
7. Rao V.G., Yadav R., Dolla C.K., Kumar S., Bhondeley M.K., Ukey M. (2005). Under nutrition & childhood morbidities among tribal preschool children. Indian J Med Res 122, 43-47. (0.600)
8. Saha K.B., Verma A.(2006) High fertility among scheduled tribes of Madhya Pradesh: a concern, Indian Journal of Medical Research 123, Jan. 2006, 89-90. (0.600)

In Non- indexed Journals:

1. Chakma T., Meshram P.K., Rao P.V., Singh S.B., Dolla C.K. (2005). Nutritional status of pre-school Children in Baigas- Primitive tribe of central India, Indian Paediatrics (in press).
2. Chouhan R, Wadher J and Chakma T. (2005): High Prevalence of Chlamydia Trachomatis Antibody Among Patients With Pelvic Inflammatory Disease of Jabalpur District of Madhya Pradesh. Asian Journal of Obstetric & Gynaecological Practice. 93, 34-37.
4. Dolla C.K., Meshram P.K, Kumar D. (2005). Nutritional status of Pando tribe in central India. Indian Journal of Preventive and Social Medicine (accepted).
5. Dolla C.K., Meshram P., Shrivastava P., Karforma C., Das S., Uike M. (2005). Nutritional status of Kodaku Pre-school children in central India. Journal of Human Ecology 17 (3): 229-23.
6. Dolla C.K., Meshram P.K, Verma A. Shrivastav P, Karforma C., Patel M.L. Kousal L.S. (2005). Health and Morbidity Profile of Bharias-A Primitive Tribe of Madhya Pradesh. Journal of Human Ecology (accepted).
7. Gyan Chand, V. Soan, Dash A. P.: Breeding preferences of Dengue vector *Aedes aegypti* in Jabalpur city. To be appeared in special issue of the proceedings of the National Academy of Sciences India, Section B (Biological Sciences).
8. Kumar D., Verma A., Sehgal V.K., Dolla C.K. (2005). Effect of Sex and Survival of Infants on Fertility in a Primitive Tribe of Chhattishgarh :A Factorial Analysis. Indian Journal of Preventive and Social Medicine (accepted).
9. Pande P.L., (2005). Prevalence of Thalassaemia among the Sindhi community of Jabalpur, M.P., India, 17 (2) Journal of Human Ecol.ogy.
10. Saha K.B.,Jain D.C.,Saha U. Unfolding contraceptive technology: where Indian population stand today? Journal of Human Ecology (in press).
11. Saha K.B., Saha U. Concern for post-natal care services-usually or lesservalue service in rural areas (A study among the primitive Lodha tribe of West Bengal), Tribal Health Bulletin (accepted).

Conferences / Workshops attended by RMRCT Scientists

Dr. Neeru Singh attended NVBDCP trainers training at Directorate of Health Services Bhopal and delivered a lecture on 27th October 2005.

Dr. Neeru Singh, Dr. V.G. Rao, Mr. Gyanchand, Dr. Dasarathi Das, Dr. Anup Anvikar and Dr. C. K. Dolla attended International Conference on Malaria at NIMR Delhi from 4th to 6th November 2005 and presented papers.

Dr. Neeru Singh attended a conference "Vivax Malaria Research: 2005 and Beyond" at the Institute for Genomic Research at Washington DC, USA on 9th and 10th December 2005 and presented a poster.

Dr. V.G.Rao attended a WHO-ICMR Workshop on 'Molecular Surveillance Network for Measles in India' at NIV, Pune on 17th and 18th October 2005.

Dr. V. G. Rao and Dr. Tapas Chakma attended Third South-East Asia and Western Pacific Bi-regional Tephinet Conference at Chennai from 9th to 12th January 2006 and also presented papers.

Dr. R. B. Gupta, Mr. Gyanchand and Dr. Rajiv Yadav attended XVII National Congress of Parasitology at RMRC, Dibrugarh, from 24th to 26th October 2005.

Dr. T. Chakma attended the UNICEF workshop on Integrated Approach to Fluorosis Mitigation at Dhar and Jhabua on 28th and 29th March 2006 respectively.

Smt. P.L. Pande attended II International conference on Psychotherapy, Yoga and Spirituality at Haridwar from 27th to 29th November 2005 and also presented a paper.

Dr. K.B. Saha attended a workshop on Gender and Reproductive Health at National Institute of Rural Development, Hyderabad from 16th to 22nd January 2006.

Dr. Anup Anvikar attended Indo-US workshop on diarrhea and enteric parasites at NICED, Kolkata, from 3rd to 5th October 2005.

Dr. Anup Anvikar presented a paper at International Conference on Opportunistic Pathogens in AIDS at AIIMS, New Delhi on 27th to 29th March 2006.

Dr. C. K. Dolla attended National Workshop on Development of guidelines for effective home based care and treatment of children suffering from Acute Severe Under Nutrition at AIIMS, New Delhi from 11th to 13th November 2005.

Dr. C. K. Dolla attended 9th World Congress on International Union against Sexually Transmitted Infections at Bangkok, Thailand, from 15th to 18th November 2005 and presented a paper.

Mr. Dinesh Kumar and Dr. Arvind Verma attended 23rd National Conference of Indian Society for Medical Statistics at JNMC, Belgaum from 19th to 22nd January 2006 and presented papers.

Mr. S.B. Singh and Mr. Pradeep Meshram attended the Annual Conference of Nutrition Society of India at National Institute of Nutrition, Hyderabad, from 17th to 19th November 2005 and also presented papers.

Mr. S.N. Singh attended Training Course on IT Application in Libraries and Information Management organized by National Institute of Health and Family Welfare, New Delhi, from 7th to 11th November 2005.

EVENTS

1. Rajbhasha Fortnight

The Centre observed Rajbhasha Fortnight from1st to 15th September 2005. Different competitions were organized for staff members like Hindi Typing/drafting, extempore essay writing and slogan writing competitions. Prizes were also distributed under the incentives scheme for doing official work originally in Hindi.

2. National Science Week Celebration

As a part of a National Science Week (28th February to 5th March 2006) celebration, a scientific exhibition focusing the achievements of the centre over last two decades was displayed.



Scientific Exhibition during National Science Day

3. New scientists join RMRCT

Five new scientists joined RMRCT during last six months either by transfer or as new appointment. They are Dr. S.R. Qamra (Assistant Director), Dr. Neelima Mishra (Senior Research Officer), Dr. Bhagirathi Lal, Dr. Jyothi Bhat & Dr. R. K. Sharma (Research Officers).

4. Foundation Day

The centre celebrated its Foundation Day on 1st March 2006. Prof. A.P. Dash, Director National Institute of Malaria Research, New Delhi, delivered the chief guest lecture and also released the RMRCT Update along with Late Dr. M. A. Ansari, Director, RMRCT, Jabalpur in presence of Hon'ble Justice Tamaskar.



Prof. A.P. Dash releasing RMRCT Update. Also present, late Dr. M. A. Ansari and Hon'ble Justice Tamaskar.

5. Retirement:

Mrs. N.G. Ambujam, Laboratory Servant retired in the month of February 2006. Late Dr. M.A. Ansari, Director of the centre felicitated her.



Late Dr. M.A. Ansari, Director of the centre felicitating Mrs. Ambujam

Designed & Printed at AQUA PROCESS, Nagpur Tel:(0712) 2523513

Published by: **Officer-in-charge, Regional Medical Research Centre for Tribals**
Nagpur Road, P.O. Garha, Jabalpur - 482003 (M.P.) Tel : (0761) 2672239 Fax : (0761) 2672835
Email: rmrctjabalpur@rediffmail.com