International Journal of Zoology and Applied Biosciences **ISSN: 2455-9571**
Volume 2, Issue 6, pp: 320-324, 2017
https://doi.org/10.5281/zenodo.1312691
http://www.ijzab.com
Research Article

MIGRATORY LABOURERS AND MALARIA IN WESTERN UTTAR PRADESH, INDIA

Abhay Kumar Sharma*

Centre for Medical Entomology and Vector Management, National Centre for Disease Control,
22 Sham Nath Marg Delhi-110054, India

Article History: Received 8th October 2017; Accepted 1st December 2017; Published 4th December 2017

ABSTRACT

Malaria has become a global problem. It is endemic in 107 countries and is responsible for over 300 to 500 million clinical cases and more than a million deaths each year. Over 3.2 billion people live under the threat of malaria. The relationships between human population movement and health are well established facts at global level. In case of malaria role of migratory labour was studied in the Western Uttar Pradesh. Attempt was made to assess malaria related knowledge, habit and practice of migratory labour working in agriculture and road construction.

Keywords: Migratory labourers, Malaria, Western Uttar Pradesh, India.

INTRODUCTION

Malaria is the most important tropical disease, widespread throughout the tropics, also occurring in many temperate regions. It exacts a heavy toll of illness and death - especially amongst children and pregnant women. It poses a risk to travelers and immigrants, with imported cases increasing in non-endemic areas (WHO, 2005). Historically, population movement has contributed to the spread of this disease (Prothero, 1977). Failure to consider this factor contributed to failure of malaria eradication campaigns in the 1950s and 1960s (Bruce-Chwatt, 1968). In India, during the post – resurgence phase, malaria has been recognized as one of the major health problems and its origin has been often linked with the migration of population, especially labourers from rural areas (Sharma *et at*., 1985; Kondrashin, 1987).

The movement of infected people from areas where malaria was still endemic to areas where the disease had been eradicated led to resurgence of the disease. However, population movement can precipitate or increase malaria transmission in other ways as well. As people move, they can increase their risk for acquiring the disease through the ways in which they change the environment and through the technology they introduce, for example, through deforestation and irrigation systems (Service, 1991). Such activities can create more favorable habitats for *Anopheles* mosquitoes; at the same time, workers may have increased exposure to the vector. Furthermore, people can inadvertently transport infectious mosquitoes to malaria-free areas, reintroducing disease. Population movement is also increasingly implicated in the spread of drug resistance in malaria (Rajagopalan *et al.,* 1986).

The migration of population has become a socio-economic phenomenon. It occurs due to marginalization of rural holdings where economy of rural population is shattered due to increase in family size as a consequence of the population explosion. The rural population migrates to other areas in search of livelihood and to maintain or prevent deterioration in living standard of the family. The industrial development in a country also triggers migration of rural population to industrial and urban areas. A well – known phenomenon of tropical aggregation of labour and associated malaria has been studied and described by a large number of malariologists. The labour migrate from malarious to non- malarious areas bring immune and non – immune population together coupled with local and imported parasite reservoir at the site of temporary camps. As a result of this, focal outbreaks of malaria are sometimes explosive involving the migratory population and then gradually extending to local population, if not checked in time (Sharma *et al*., 1996; Martens and Hall, 2000).

Agriculture related malaria has another dimension on account of large scale movement of population from one

*Corresponding Author: Dr. Abhay Kumar Sharma, Centre for Medical Entomology and Vector Management, National Centre for Disease Control, 22 Sham Nath Marg Delhi-110054, India, Email: drabhayncdc@gmail.com

part of the country to another for sowing, transplanting and harvesting of crops. These activities are usually undertaken during the rainy season or just after the rains. Therefore, the migratory population living in temporary huts constructed for the purpose is more exposed to malaria transmission. In Swaziland the resurgence of malaria was catalyzed by the reintroduction of parasite carriers in the form of migrant workers from diseases – endemic areas of Mozambique, who were involved in migration or long term circulation to work on the sugar estates in the 1960s and early 1970s (Packard, 1986).

In the developing countries, urbanization, colonization and labour related to agriculture activities are main reasons for the population movements. Human population explosion and extensive development in South Asia including India over the last two decades have significantly changed the epidemiology of malaria in the region. One of the important factors which play an important role in the malaria transmission is the knowledge to migratory population regarding malaria.

MATERIALS AND METHODS

Study area: This study was carried out in the district Ghaziabad in Western Uttar Pradesh during 2004. Ghaziabad is situated at latitude 28^0 40' north and longitude 77^0 25' east, 19 Kms. east of Delhi and 46 Kms. south-west of Meerut in between the river Ganga and Yamuna. On the north it is bounded by the district of Meerut, on the south by Bulandshahar and Gautambudh Nagar and on the east by the district Jyotibaphule Nagar, while the National capital territory Delhi encompass the district at the southwest. Ganga, Yamuna and Hindon are the main rivers flowing through the district and they are filled with water throughout the year. Other than these, there are some small rain fed rivers, prominent among them is the Kali river. Apart from these rivers the Ganga canal flows through the district and which has been utilized for the irrigation through various small canals. Ganga canal also caters the drinking water needs of the people of Ghaziabad and Delhi. The population of the, district has been increased from 5, 81,886 (in 1901) to 23, 35,680 (in 2001) mainly on account of its rapid industrialization. Besides, the soil of this district is very fertile and majority of the community depends on agriculture for their livelihood. The main crop is Wheat, Rice and Sugarcane. Labourers from various parts of the country migrate to Western Uttar Pradesh for employment in the agriculture sector, primarily sugar industries. Due to low cost of living a large number of people prefer to reside here which has also resulted many developmental and construction activities. A large migratory workforce is employed in these construction activities. Most of this workforce is from the malaria endemic states.

During 1996 Delhi has witnessed a major outbreak of malaria (10,652 cases), which was considered, a result of unchecked population migration (in terms of labour forces) from many endemic areas of the country. The congregation of these labourers from various endemic parts of the country is one of the main reasons for maintaining transmission of malaria in Delhi in spite of the control measures taken by New Delhi Municipal Corporation (NDMC), Municipal Corporation of Delhi (MCD) and Delhi Cantonment Board (Saxena and Devadethan, 1998; Saxena, 2001). Delhi is surrounded by two districts of Western Uttar Pradesh *viz.*, Ghaziabad and Gautam Budh Nagar and four districts of Haryana, *viz.*, Faridabad, Gurgaon, Jhajjar and Sonipat.

Similar, to Delhi, during 2000, there was a sudden spurt of *P. falciparum* cases in the district. From 10 cases in 1999, Pf cases were increased to 177 during the year 2000, which was declined to 73 in year 2001. However, the situation was brought under control by effective prevention and control measures taken by anti malaria programme of the State Government. But this area always possesses epidemic potential due to the unchecked population movement and this study was conducted to assess the degree of threat due to the immigration of the labourers from various endemic states of the country.

RESULTS AND DISCUSSION

In the present study 200 migratory labourers engaged in the agriculture activities and road constriction were interviewed by using a pre-tested questionnaire. Out of the total 98.5 per cent were engaged in agriculture activities while only 1.5 per cent was found to be involved in road construction work. Twenty two per cent labourers were below the age of 20 years, 26.5 per cent were between the ages of 21-25 years and 34 per cent were between the ages of 26-30 years while 17.5 were above the age of 30 years. Forty two per cent respondents were completed their education upto 5^{th} standard, 12.0 per cent upto 10^{th} standard and 0.5 per cent upto 12^{th} standard while 45.5 per cent were illiterate. The percentage of married labourers was 68.5. Only 31.0 per cent labourers leave their native place due to unemployment while the rest leave due to low income. All the labourers were living here without family.

The study revealed that only 17.0 per cent labourers sleep at the agriculture farm away from village, 32.0 per cent in the separate room in the house, 14.0 per cent in a separate house in the village. Only 6.5 per cent were sleep in a single room with local inhabitant while 30.5 per cent sleep outside the houses.

As far as the native states and districts of the migratory labourers is concerned 81.0 were from the 14 districts of Bihar and 7.5 per cent from Dhanbad district of Jharkhand state while rest come from of Eastern districts of Uttar Pradesh. Maximum number of labourers comes from district Purbi Champaran, Purnia, Araria and Samastipur of Bihar (Table 1).

Table 2 shows the knowledge and awareness regarding malaria among the interviewed subjected. About eight questions were asked from each labour. Regarding the transmission of malaria, 51.0 per cent knew that it is transmitted by mosquito bite, while 29.0 per cent replied that it is transmitted by drinking contaminated water, while 13.5 per cent did not know anything about the transmission

of malaria. About the mosquito breeding, 61.5 per cent labourers reply that mosquitoes breeds in polluted water while 32.0 per cent reply that it breeds in contaminated waste, while 5.0 per cent did not have any knowledge about the breeding of the mosquitoes. Fifteen per cent labourers have suffered from malaria in the past at there native places.

The study also revealed that for the treatment of malaria, 90.5 per cent labourers prefer to go to local doctor while only 1.5 per cent prefers to go at government hospital and rest prefers private doctor. For the confirmation of malaria 20.5 percent knew that it is possible by blood examination, while 69.5 per cent said diagnosis is done clinically. Regarding the use of protective measure, 47.5 per cent labourers uses bed net, while 15.5 per cent use coil and 35.0 per cent labourers did not use anything for the protection of mosquito bite in the village. The survey revealed that for 78.5 per cent labourers there was not any fixed time to go their native place while 21.0 per cent go once a year to their native place. Most of the labourers come in the month of May and go back in the month of October. This is the time when number of malaria cases increase. Saxena and Devadethan (1998) also pointed out the importance of timing of the seasonal movements of the labour forces on the spread of malaria.

Table 1. Distribution of migratory labourers according their native district.

State	District	Number	Per cent
Bihar	Purbi Champaran	27	13.50
	Purnia	32	16.00
	Saharsa	6	3.00
	Sitamarhi	2	1.00
	Darbhanga	7	3.50
	Saran	8	4.00
	Muzaffarpur	11	5.50
	Munger	9	4.50
	Siwan	10	5.00
	Kishanganj	5	2.50
	Patna	11	5.50
	Araria	15	7.50
	Katihar	8	4.00
	Samastipur	11	5.50
	Total	162	81.00
East Uttar Pradesh	Ghazipur	6	3.00
	Mau	4	2.00
	Gorakhpur	2	1.00
	Gonda	2	1.00
	Deoria	3	1.50
	Basti	4	2.00
	Sonbhadra	1	0.50
	Jhansi	1	0.50
	Total	23	11.50
Jharkhand	Dhanbad	15	7.50
	Total	15	7.50

Table 2. The knowledge and awareness about malaria among the migratory labourers.

		Number	Per cent
Q. 1.	How malaria is transmitted ?		
A. 1.	Dirtiness	7	3.50
2.	Drinking contaminated water	58	29.00
3.	Mosquito bite	102	51.00
4.	By housefly	6	3.00
5.	Don’t know	27	13.50

Q. 2.	Where mosquito breeds ?		
A. 1.	Clean water	3	1.50
2.	Contaminated/ Polluted water	64	32.00
3.	Wastes	123	61.50
4.	Don't know	10	5.00
Q. 3.	Have you suffered form malaria ?		
A. 1.	Yes (at native place)	15	7.50
2.	No	185	92.50
Q. 4.	If suffered from malaria where will you go ?		
A. 1.	Local doctor	181	90.50
2.	Govt. hospital	3	1.50
3.	Private doctor	16	8.00
Q. 5.	How you understood that you have malaria ?		
A. 1.	By blood examination	41	20.50
2.	By symptoms	20	10.00
3.	Told by doctor	139	69.50
Q. 6.	Who treated you ?		
A. 1.	Own	200	100
2.	Owner	-	-
Q. 7.	What mosquito protective measure using ?		
A. 1.	Bed net	95	47.50
2.	Coil	31	15.50
3.	Mate	4	2.00
4.	Nothing	70	35.00
Q. 8.	Time to go native place.		
A. 1.	Once a year	42	21.00
2.	Twice a year	1	0.50
3.	Not fixed	157	78.50

Month of coming – May ; Month of going – October

CONCLUSIONS

The poor knowledge and awareness about malaria among the migratory labourers increases the possibility of transmission of malaria in the study area. The study indicates that the movement of these migratory labourers needs to be monitored and they should be screened for malaria parasites on their return from their native places.

ACKNOWLEDGEMENTS

The authors are thankful to the Director, National Centre for Disease Control, Delhi and Head, division of Centre for Medical Entomology and Vector Management for encouragement for the study.

REFERENCES

Bruce-Chwatt, L.J., 1968. Movements of populations in relation to communicable disease in Africa. *East Afr. Med. J.*, 45, 266-275.

Kondrashin, A.V., 1987. Practical implication of population movement on epidemiology of malaria in South East Asia. *J. Com. Dis*., 19(1), 81-85.

Martens, P. and Hall, L. 2000. Malaria on the move: Population movement and malaria transmission. *Emerg. Infect. Dis*., 6(2), 1103-1109.

Packrd, R.M., 1986. Agriculture development, migrant labour and the resurgence of malaria in Swaziland. *Soc. Sci. Med.*, 22, 861-867.

Prothero, R.M., 1977. Disease and mobility: a neglected factor in epidemiology. *Int. J. Epidemiol*., 6, 259-267.

Rajagopalan, P.K., Jambulingam, P., Sabesan, S., Krishnamoorthy, K., Rajendran, S., Gunasekaran, K., Kumar, N.P., Prothero, R.M., 1986. Population

movement and malaria persistence in Rameswaram Island. *Soc. Sci. Med*., 22, 879-86.

Saxena, V.K., 2001. Eco-epidemiological Characteristics of an unstable peri-urban focus of *falciparum* malaria. *J. Com. Dis.*, 33(1), 1-6.

Saxena, V.K. and N.D. and Devadethan, M.A., 1998. Impact of the seasonal migration of labour forces on the spread of malaria. *Ann. Trop. Med. Parasitol.*, 7, 821-822.

Service, M.W., 1991. Agricultural development and arthropod-borne diseases: a review. *Rev. Saude Publica*, 25, 165-168.

Sharma, R.S., Sharma, G.K. and Dhillon, G.P.S., 1996. Epidemiology and control of malaria in India. Govt. of India, Ministry of Health and Family Welfare, National Malaria Eradication Programme, (DGHS), 153-169.

Sharma, V.P., Uprety, H.C., Srivastava, P.K. and Chandrahas, R.K., 1985. Studies on malaria transmission in hutments of Delhi. *Indian J. Malariol.*, 22(2), 77-84.

WHO, 2005. World Malaria Report 2005. Roll Back Malaria, World Health Organization and Unicef, Geneva, pp. 1-30.