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Study of Epidemiology of Malaria infections in Tribal Community Health and Nutrition Center Jainoor of Adilabad, Telangana, India

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Abstract

Malaria is estimated as one of the top 3 killers among infectious diseases by WHO.The occurrence of malaria is highly influenced by factors related to the parasite, the vector, the human host and especially the environment. In many places transmission is seasonal with the peak during and just after rainy season. Present study conducted in tribal CHNC Jainoor of Adilabad district Telangana. During 2013 and 2014 revealed that the malaria incidence due to Plasmodium falciparum was considerably high. Adilabad is mainly tribe-inhabited and one of the highly endemic district of Telangana Malaria cases from 2013 and 2014 were collected from the CHNC Jainoor total 350 clinically malaria patients from CHNC Jainoor from month of January to December of 2013 and 2014, were chosen for the study ranging, from infants to 80 years old. Finally it is concluded that during the study period Majority of malaria infections occur between months of July to December with peak in September to November. Usually high number of cases of Plasmodium falciparum malaria found in this region, Moreover large numbers of cases about 49.1% were found in age group of 15 and above years. It shown that these people are more prone to the Malaria.

Key-Words: Malaria Epidemiological Investigation, Malaria incidence, ABER, API, SFR, SPR, Community Health and Nutrition Center (CHNC)

Introduction

Malaria, sometimes called the "King of Diseases", is caused by protozoan parasites of the genus *Plasmodium*. (MMV website. Curing malaria together. (Accessed October 16, 2008*).* Malaria, transmitted via the bites of Anopheles mosquitoes, is one of the most important parasitic diseases affecting mankind (White NJ, Pukrittayakamee S etc, 2014). More than 3.4 billion people were exposed to the risk of malaria in 2012, and there were an estimated 207 million cases and 627,000 malaria deaths (WHO: World Malaria Report. Geneva: World Health Organization; 2013. Murray CJ, Ortblad KF, Guinovart C, Lim SS, Wolock TM, Roberts DA, etc 2014). Much effort and progress to control and eliminate malaria has been made by the World Health Organization, affected countries as well as many other cooperative partners (Chiyaka C, Tatem AJ, Cohen JM, Gething PW, Johnston G, Gosling R, 2013). By 2010, 108 countries in the world are malaria free and 99 countries have continuing malaria transmission (Feachem RG, Phillips AA, Hwang J, Cotter C, Wielgosz B, Greenwood BM etc 2010).

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It is a life-threatening disease in India causing significant mortality and morbidity despite concerted efforts to control it. According to the World Malaria Report 2014, 22% of India's population live in high transmission (> 1 case per 1000 population) areas, 67% live in low transmission (0–1 cases per 1000 population) areas and 11% live in malaria-free (0 cases) areas.(World Malaria Report, 2014). The biggest burden of malaria in India is borne by the most backward, poor and remote parts of the country, with >90-95% cases reported from rural areas and <5-10% from urban areas. The majority of malaria cases and deaths in India are being reported from Odisha, the seven North Eastern States, Jharkhand, Chhattisgarh, Madhya Pradesh Rajasthan, West Bengal, Karnataka and Telangana.

The risk factors leading to complete reconciliation of cause and effect relationships of malaria were identified in India by GIS based studies (Srivastava et al., 1999 & 2003). Persistent malaria is the characteristic feature in most forest areas and both Plasmodium *vivax* and Plasmodium *falciparum* are prevalent in forest areas of Madhya Pradesh (Singh and Khare, 1999). Hema Joshi (2003) reported the

existence of genetic diversity among the field isolates of P. *falciparum* and P. *vivax* in India. Malaria is the most prominent and problematic of all vector borne communicable diseases of Adilabad district Telangana. Incidence of malaria has been observed very high in Adilabad, and Khammam. Three paradigm of malaria are observed in the state i.e., tribal, rural and urban. Hence, the present study was focused on study of malaria incidence in selected tribal, rural CHNC of Adilabad district, Telangana, India.

Material and Methods

Study Area: The study was carried out in Department of Zoology, University college of Science Osmania University Hyderabad during the period of January 2013 to December 2014. In the present study, Jainoor CHNC of Adilabad district are selected because it is occupied by tribal and rural people and to get awareness of some communicable diseases. In the present study prevalence of malaria cases was studied for 2 successive years from 2013 and 2014. The data was obtained through cross- sectional record based study. Adilabad district is approximately populated with 2,741239 people, out of which 760,259(27.73%) were of urban and 1,980,980(72.27) were of rural. This district is occupied with 44.8 forest range. The annual rainfall is 1044.5 mm as per 2011 data.

Study Period: The data regarding malaria cases from 2013 to 2014 was collected from the Malaria Department of Adilabad district. The no. of cases of Malaria infection was identified in Jainoor CHNC ONE STEP Malaria Anti - P. f. / P. v. Test and infection was confirmed by examining the blood smear microscopically. To support the data, other epidemiological parameters like Annual Blood Examination Rate (ABER), Annual Parasite Incidence (API), and Annual Falciparum Incidence (AFI), Blood slide Positive Rate (SPR) and Slide Falciparum Rate (SFR) were also represented.

Annual Blood Examination Rate (ABER): It is the proportion of blood slides examined for malaria in a human population in a year. ABER is calculated using the formula given below:

$$ABER = \frac{No\ of\ blood\ slides\ examined\ in\ year}{Total\ population\ surveyed} x100$$

Annual Parasites Incidence (API)
It is expressed as the number of malaria positive cases in a particular year for a particular place per thousand population.

$$API = \frac{Total\ no\ of\ malaria\ positive\ cases\ in\ a\ year}{Population\ of\ the\ area} x1000$$

Slide Positive Rate (SPR)
It is expressed as the proportion of positive slides out of those examined for malaria.

$$SPR = \frac{Total\ no\ of\ positive\ cases\ detected}{Total\ no\ of\ blood\ smears\ Examined} x100$$

Slide Falciparum Rate (SFR)
It is the proportion of slides showing P. falciparum infection out of the total slides examined for malaria. No. of P. f. slides.

$$SFR = \frac{No.of\ P.f.cases\ detected}{Total\ Slides\ Examined} \times 100$$

Results and Discussion

The malaria cases were recorded in CHNC. In the year 2013, out of 127 cases 54 (42.5%) cases were 15 and above year age group, 21 (16.5%) cases were 10 to 14 year age group. 26 (20.4%) cases were 5 to 9 year age group 26 (20.4%) cases were 1 to 4 year age group and 0 (0%) case were 0 to 1 year age group In the year 2014, out of 223 cases 118 (53%) cases were 15 and above year age group, 40 (18%) cases were 10 to 14 year age group. 41 (18.3%) cases were 5 to 9 year age group23 (10.3%) cases were 1 to 4 year age group and 1 (0.4%) case were below one year age group. In both years 2013 and 2014 it is concluded that Majority of malaria infections occur between months of July to December with peak in September to November. Usually high number of cases of Plasmodium falciparum malaria found in this region, Moreover large numbers of cases about 49.1% were found to occur in age group of 15 and above years. It shown that these people are more prone to the Malaria.

The falciparum cases found to be more in 2014 when compared to the previous year it was also observed that incidence of malaria was high during the year 2014..Thus the P.f. cases are increasing which Conveys that P.f. parasite is becoming a drug resistance in Adilabad district population. The Annual Blood Examination Rate (ABER) and Annual Parasite Incidence (API), was observed high in 2014. Malaria is an extremely climate-sensitive tropical disease. In jainoor region it is found in epidemic form especially in rainy and post rainy season. Throughout the year malaria infections are usually recorded in good numbers but in September and October months Plasmodium falciparum infections found at peak, which disappear soon at the starting of year up to June. Key interventions to control malaria include: prompt and effective treatment with artemisinin-based combination, use of insecticidal nets by people at risk; and indoor residual spraying with insecticide to control the vector mosquitoes.
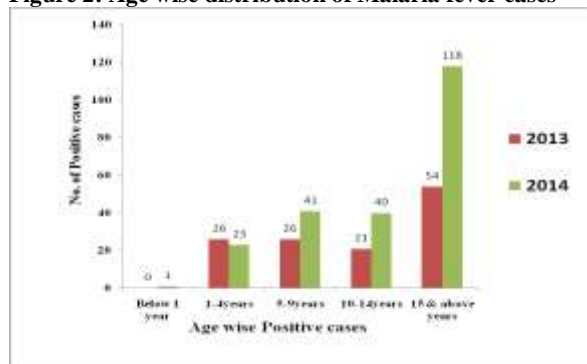
Figure1: Month wise distribution of Malaria Fever cases
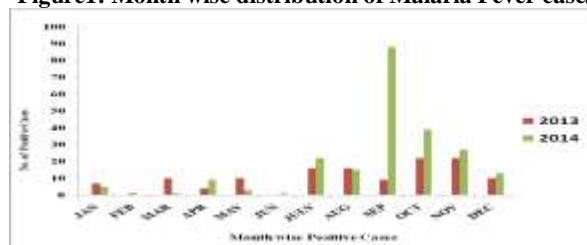
Figure 2: Age wise distribution of Malaria fever cases

Table 1: Prevalence of Malaria in Jainoor 2013 and 2014

Community Health and Nutrition Center Jainoor				
YEAR	ABER	API	SPR	SFR
2013	33.2	2.1	0.65	0.65
2014	58.5	3.8	0.65	0.63

References
1. MMV website. Curing malaria together. [Accessed October 16, 2008]. Available at: http://www.mmv.org.
2. White NJ, Pukrittayakamee S, Hien TT, Faiz MA, Mokuolu OA, Dondorp AM: MALARIA. Lancet 2014, 383:723–735.
3. WHO: World Malaria Report. Geneva: World Health Organization; 2013.
4. Murray CJ, Ortblad KF, Guinovart C, Lim SS, Wolock TM, Roberts DA, Dansereau EA, Graetz N, Barber RM, Brown JC, Wang HD, Duber HC, Naghavi M, Dicker D, Dandona L, Salomon JA, Heuton KR, Foreman K, Phillips DE, Fleming TD, Flaxman AD, Phillips BK, Johnson EK, Coggeshall MS, Abd-Allah F, Abera SF, Abraham JP, Abubakar I, Abu-Raddad LJ, Abu- Rmeileh NM, et al: Global, regional, and national incidence and mortality for HIV, tuberculosis, and malaria during 1990–2013: a systematic analysis for the Global Burden of Disease Study 2013. Lancet 2014, 384:1005–1070.
5. Chiyaka C, Tatem AJ, Cohen JM, Gething PW, Johnston G, Gosling R, Laxminarayan R, Hay SI, Smith DL: Infectious disease. The stability of malaria elimination. Science 2013, 339:909–910.
6. Feachem RG, Phillips AA, Hwang J, Cotter C, Wielgosz B, Greenwood BM, Sabot O, Rodriguez MH, Abeyasinghe RR, Ghebreyesus TA, Snow RW: Shrinking the malaria map: progress and prospects. Lancet 2010, 376:1566–1578.
7. World Malaria Report 2011, Geneva, World Health Organization, 2014.
8. A. Srivastava, B.N. Nagpal, R. Saxena and V.P. Sharma, .Geographical Information System as a tool to study malaria receptivity in Nadiad Taluka, Kheda District, Gujarat, India..
9. Southeast Asian Journal of Tropical Medicine and Public Health, 30, pp. 4, 1999.
10. N. Singh, and K.K. Khare, .Forest Malaria in Madhya Pradesh: Changing scenario of Diseases and its Vectors. Journal of Parasitic Diseases, 23, pp. 105-112, 1999.
11. Hema Joshi, .Markers for population genetic analysis of human plasmodia species, *Plasmodium falciparum* and *Plasmodium vivax.* Journal of Vector Borne Diseases, 40, pp. 78. 83, 2003.
12. S. Matta, A. Khokhar, and T.R. Sachdev, .Assessment of knowledge about malaria among patients reported with fever: A Hospital-Based Study. Journal of Vector Borne Diseases, 41, pp. 27-31, 20.
13. S.N. Sharma, N.B.L. Saxena, P.K Phukan, J.K. Anjan, Pandya, A.P.and Shiv Lal, .Impact assessment of IEC campaign during antimalaria month June 1998 through KABP study. Journal of Communicable Diseases, 32, pp.49-53,2000