ORIGINAL ARTICLE

Prevalence of Malaria among Hospitalized Fever Cases of a Tribal District Tertiary Care Centre of South India

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Abstract

Introduction: *Malaria is a common condition in tribal regions globally and can be a killer disease if not treated. In India it is widely prevalent specifically in rural and tribal regions and responsible for huge number of morbidity and also mortality.* ***Aims:*** *To know the status of malaria in hospitalized fever cases at a tertiary care centre of a tribal cum rural region of south India.* ***Materials and Methods:*** *Data of six months of all fever cases screened for malaria, reported to RIMS and National Vector Borne Disease Control Program (NVBDCP) and hospitalized was collected and analyzed.* ***Result:*** *Out of 4060 hospitalized fever cases 154 (slide positivity rate SPR 3.71) were malaria positive including 148 (96.1%) Falciparum and 6 (3.9%) vivax malaria. Among all the diagnosed malaria cases, 74 were male (1.82% from all fever cases and 2.43% among all male screened cases) while 80 were female cases (1.97% from all fever cases and 7.88% among all female screened cases) indicating relatively high number of cases in less reported female fever cases. Villages were found with poor preventive precautions. Most were farmers and didn't know about how malaria spreads.* ***Conclusion:*** *With many limitations of the study it can be concluded that, malaria is not uncommon in the region. Number of falciparum malaria is also common and females are the main victims of complicated falciparum malaria. There is urgent need for more serious malaria awareness and control program for the region.*

Keywords: *Falciparum malaria, Malaria control programs, Vivax malaria*

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Introduction

Malaria is a global problem and widely prevalent in most of the countries specifically it is a huge public health problem in developing countries. In African countries, thousand are dying with it and even in some of those countries it is a big epidemic problem. Malaria is a commonest condition in tribal regions globally and a killer disease in untreated cases. India also contributes substantially to global malaria burden. In India it is widely prevalent specifically in rural and tribal regions and responsible for huge number of morbidity and also mortality as shown by number of studies which were conducted in various regions of India, namely few are Rourkela and Cuttack, Orissa, Bikaner, Rajasthan and Jabalpur [1], [2].

But the prevalence and incidence picture is different in all the regions. For example WHO in 2006 estimated 15000 malaria deaths in India [3] while Neeraj Dhingar et al from their study which was conducted between 2001 to 2003 found 3-6% malarial deaths [4]. Hay SI et al commented that 86% malarial deaths in India are not seen in formal health care system hence malarial deaths are largely unnoticed by Indian health care system. They also opined from reference of Dash AP that "Indian national health information system is not efficient for the recording of malaria morbidity and mortality" [2][5].

In India, rural and tribal regions are more vulnerable for malaria as these areas are

relatively underdeveloped specifically tribal regions because of difficulty in reaching those areas as fruits of development have still not reached those regions. Malaria is widely prevalent in these regions. Moreover, huge number of fever cases also represents malaria in such regions. The present study region is also among the rural cum tribal region of India. It will be useful if some malaria related information also comes from this region although government health information machinery is already reporting malaria. Hence the present study was planned to know the status of malaria in hospitalized fever cases at a tertiary care centre of Adilabad, a tribal cum rural region of south India. The collected information can be used to control the problem of malaria in this region.

Materials and Methods

It was a retrospective study conducted at Rajiv Gandhi Institute of Medical Sciences (RIMS) Adilabad. Study was conducted in 2013 and data of six months from the record section of RIMS Adilabad was seen. Data of six months of all fever cases screened for malaria, reported to RIMS and National Vector Borne Disease Control Program (NVBDCP) and hospitalized was collected and analyzed. All the age group cases of either sex were included in the study.

Results

During the six month period a total of 4060 cases of fever including male and female, were screened for malaria. All the patients were from villages and most of them were farmers. Out of all those fever cases 154 (3.79%) cases were positive for malaria (slide positivity rate SPR 3.79). Commonest age group was in between 5 to 14 years (46 cases, 30%) followed by 15 to 29 years (43 cases, 28%). Least number of cases were seen in age group of <1 to 4 years (17 cases, 11%) Table- 1.

Among all the diagnosed malaria cases, 74 were male (1.82% from all fever cases and 2.43% among all male screened cases) while 80 were female cases (1.97% from all fever cases and 7.88% among all female screened cases) indicating relatively high number of cases in less reported female fever cases (Table- 2).

Plasmodium falciparum 148 (96.1%) was mainly detected among all the hospitalized malaria cases and only few cases were of Plasmodium Vivax 6 (3.90%). 15 (9.74%) cases of Falciparum malaria were hospitalized for complications. One (0.65%) cerebral malaria case was detected. 2 (1.30%) cases were of pulmonary tuberculosis with malaria. Most of the patients reported after one week of onset of fever. Chloroquine was mainly given to Vivax patients while quinine to Falciparum cases. Most of the patients reported that they observe malaria preventive precautions poorly. Most of them don't know about how malaria spreads.

Table-1: Age wise malaria distribution

Age	Positive Cases	Percentage
<1 Years	5	3
1-4 Years	12	8
5-14 Years	46	30
15-29 Years	43	28
30-44 Years	28	18
>45 Years	20	13

Table- 2: Gender wise distribution

Sex	Screened Fever Cases	Malaria Positive	%	% of Total fever cases
Male	3045	74	2.43	1.82
Female	1015	80	7.88	1.97
Total	4060	154	100	3.79

Discussion

We found 3.7% hospitalization cases of fever are due to malaria and among those cases almost all are of plasmodium falciparum malaria (96%). Majority of hospitalization of malaria due Falciparum is the main and most important finding of the study. In one of the study which was carried out by Vidhan Jain et al in highly tribal region of India namely Bastar District of Chhattisgarh in which tribal population is mainly involved in agriculture and forest, observed 9% slide positivity rate with almost 50% incidence of plasmodium falciparum [1]. They found 5 years as median age of malaria and associated morbidity in children. We found 8% involvement of one to four years age group children but majority of children were in between the age group of 5 to 14 years (30%). R

Tripathy et al [6] in Orissa state of India in Cuttack region observed 8 years as age of severe malaria while Marsh K et al [7] observed 2 years as mean age of malaria in high transmission areas of Africa. Imbert P et al found 6.2 years as mean age of malaria in low transmission regions of Africa [8]. Children suffer more from malaria in comparison to adults as observed from above literature. The shift of malaria transmission towards younger age is not dependent on seasons. It is mainly because of comparatively lower immunity in children and intensity of transmission. Hence this vulnerable age group needs more attention not only for the treatment but also in the policies framed for prevention and education regarding malaria prevention programs [1][9][10][11].

Gender differences were observed in the present study. Females are suffering more in comparison to males as it is 7.88% in females while in male only 2.43% although total number of males cases are more in comparison to females. It might be due to higher percentage of overall male hospitalization as male is considered as dominant member of family in India and such traditions are more common in rural and tribal regions. Moreover, treatment seeking behavior, occupational activities and socio-cultural barriers promote male to reach the higher health centers [12],[13]. Vidhan Jain et al observed male predominance in hospitalization pattern of malaria [1]. Pathak et al also had the similar opinion as Vidhan Jain [14]. Our observations are exactly opposite to them. It is our opinion that females are hospitalized because of more severity and complications as they are not getting early treatment which their male counterparts are getting; hence males have less severity or complications so their hospitalization is less. But we cannot confirm our inference as such aspect was not recorded in the present study and hence this conclusion might not be correct.

Another important observation in the present study is the high number of plasmodium falciparum hospitalization. Plasmodium Vivax and Plasmodium falciparum both are common in the region. It is the common practice in rural and tribal regions of India that if any patient is found to be suffering from malaria, chloroquine is started immediately. Although slide test and other investigations are also done but chloroquine takes care of vivax malaria and falciparum does not respond. This is responsible for hospitalization of falciparum malaria cases as vivax malaria is managed on the OPD basis by chloroquine. Condition of male if not improved then they get early health care facilities as society is male dominant while it is late for female hence we observed more percentage of female hospitalization.

Limitations

It is very small study carried out only in hospitalized fever cases in a tertiary care centre. Study does not provide the exact and real picture of malaria in the region as most of the uncomplicated cases and even some complicated cases are treated on the OPD basis and we have not recorded and analyzed OPD data. Moreover, we have not studied malaria data from private clinics and hospitals. These private setups treat malaria more commonly in comparison to government setups. Furthermore, data from multipurpose workers and other peripheral centers including primary health centers and sub centers are also not the part of study. Hence the study does not provide the exactly true picture.

Conclusion

With many limitations of the study it can be concluded that, malaria is not uncommon in the region. Most of the malaria due to vivax is managed without complications. Number of falciparum malaria is also common and females are the main victims of complicated falciparum malaria. Most of the people are unaware about malaria. There is urgent need of more severe and serious malaria awareness and control program for the region. There is also need of better preventive practice and education.

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References

1. Vidhan Jain, Sanjay Basak, Sneha Bhandari, Praveen K Bharti, Trilok Thomas, Mrigendra P Singh, Neeru Singh. Burden of Complicated Malaria in a Densely Forested

Bastar Region of Chhattisgarh State (Central India). PLoS One. 2014;9(12): e115266. [PubMed] http://dx.doi.org/10.1371/journal.pone.0115266

2. Hay SI, Gething PW, Snow RW. India's invisible malaria burden. Lancet. 2010;376(9754):1716–1717. [PubMed] http://dx.doi.org/10.1016/S0140-6736(10)61084-7
3. WHO World malaria report 2008. http://whqlibdoc.who.int/publications/2008/9789241563697_eng.pdf. [Cross Ref]
4. Dhingra N, Jha P, Sharma VP, Cohen AA, Jotkar RM, Rodriguez PS, Bassani DG, Suraweera W, Laxminarayan R, Peto R; Million Death Study Collaborators. Adult and child malaria mortality in India: a nationally representative mortality survey. Lancet. 2010;376(9754):1768-74. [PubMed] http://dx.doi.org/10.1016/S0140-6736(10)60831-8
5. Dash AP. Estimation of true malaria burden in India: a profile of National Institute of Malaria Research. 2nd edn. National Institute of Malaria Research; New Delhi, India: 2009. pp. 91–99.
6. Tripathy R, Parida S, Das L, Mishra DP, Tripathy D, Das MC, Chen H, Maguire JH, Panigrahi P. Clinical manifestations and predictors of severe malaria in Indian children. Pediatrics. 2007;120:e454–460. [PubMed] http://dx.doi.org/10.1542/peds.2006-3171
7. Marsh K, Forster D, Waruiru C, Mwangi I, Winstanley M. Indicators of life-threatening malaria in African children. N Engl J Med. 1995;332:1399–1404. [PubMed] http://dx.doi.org/10.1056/NEJM199505253322102
8. Imbert P, Sartelet I, Rogier C, Ka S, Baujat G, et al. Severe malaria among children in a low seasonal transmission area, Dakar, Senegal: influence of age on clinical presentation. Trans R Soc Trop Med Hyg. 1997; 91(1):22–4. [PubMed] http://dx.doi.org/10.1016/S0035-9203(97)90380-1
9. Mohanty S, Mishra SK, Pati SS, Pattnaik J, Das BS. Complications and mortality patterns due to Plasmodium falciparum malaria in hospitalized adults and children, Rourkela, Orissa, India. Trans R Soc Trop Med Hyg. 2003;97:69–70. [PubMed] http://dx.doi.org/10.1016/S0035-9203(03)90027-7
10. Carneiro I, Roca-Feltrer A, Griffin JT, Smith L, Tanner M, Schellenberg JA, Greenwood B, Schellenberg D. Age-patterns of malaria vary with severity, transmission intensity and seasonality in sub-Saharan Africa: a systematic review and pooled analysis. PLoS One. 2010;5(2):e8988. [PubMed] http://dx.doi.org/10.1371/journal.pone.0008988
11. D'Alessandro U, Ubben D, Hamed K, Ceesay SJ, Okebe J, Taal M, Lama EK, Keita M, Koivogui L, Nahum A, Bojang K, Sonko AA, Lalya HF, Brabin B. Malaria in infants aged less than six months - is it an area of unmet medical need? Malar J. 2012;2(11):400 [PubMed] http://dx.doi.org/10.1186/1475-2875-11-400
12. Singh N, Chand SK, Bharti PK, Singh MP, Chand G, Mishra AK, Shukla MM, Mahulia MM, Sharma RK. Dynamics of forest malaria transmission in Balaghat district, Madhya Pradesh, India. PLoS One. 2013;8(9):e73730. [PubMed]
13. Mohapatra PK, Narain K, Prakash A, Bhattacharya, Mahanta J. Risk factors of malaria in the fringes of an evergreen monsoon forest of Arunachal Pradesh. The Nat Med J India. 2001;14:139–142. [PubMed]
14. Pathak S, Rege M, Gogtay NJ, Aigal U, Sharma SK, Valecha N, Bhanot G, Kshirsagar NA, Sharma S. Age-dependent sex bias in clinical malarial disease in hypoendemic regions. PLoS One. 2012;7(4):e35592. [PubMed] http://dx.doi.org/10.1371/journal.pone.0035592